EUROPEAN HELICOBACTER AND MICROBIOTA STUDY GROUP

EHMSG – 34th International Workshop on Helicobacter & Microbiota in Inflammation & Cancer

VIRTUAL CONFERENCE
September 18, 2021

Accepted Abstracts

www.microbiotajournal.com

DOI: 10.26355/mhd_20219_612

EUROPEAN HELICOBACTER AND MICROBIOTA STUDY GROUP

PRESIDENT: **Mirjana Rajilic-Stojanovic,** *Serbia*

MEMBERS AND INTERNATIONAL SCIENTIFIC COMMITTEE

Leif P. Andersen, *Denmark*
Lars Engstrand, *Sweden*
Antonio Gasbarrini, Italy
Javier P. Gisbert, *Spain*
Georgina Hold, *Australia*
Josbert Keller, *The Netherlands*
Marcis Leja, *Latvia*
José C. Machado, *Portugal*
Peter Malfertheiner, *Germany*
Francis Mégraud, *France*
Colm A. O'Morain, *Ireland*
Ari P. Ristimäki, *Finland*
Theodore Rokkas, *Greece*
Annemieke Smet, *Belgium*
Herbert Tilg, *Austria*

LOCAL SCIENTIFIC AND ORGANISING COMMITTEE

Dragomir Damjanov, *Serbia*
Natasa Golic, *Serbia*
Goran Hauser, *Croatia*
Miodrag Krstic, *Serbia*
Alexandar Nagorni, *Serbia*
Dragan Popović, *Serbia*
Bojan Tepes, *Slovenia*

EMERITUS MEMBERS

Anthony Axon, *United Kingdom*
Michel A.L. Deltenre, *Belgium*
Bram Flahou, *Belgium*
Giovanni Gasbarrini, *Italy*
Alexander M. Hirschl, *Austria*
Pierre Michetti, *Switzerland*
José M. Pajares Garcia, *Spain*
Ashley B. Price, *United Kingdom*
Erik A.J Rauws, *The Netherlands*
Pentti I. Sipponen, *Finland*
Torkel M. Wadström, *Sweden*

HONORARY MEMBERS

Franco Bazzoli, *Italy*
James G. Fox, *United States*
David Y. Graham, *United States*
Adrian Lee, *Australia*
Barry Marshall, *Australia*
Guido N.J. Tytgat, *The Netherlands*
Ernst Kuipers, *The Netherlands*

CORRESPONDING FELLOWS

Niyaz Ahmed, *India*
Dmitry Bordin, *Russia*
Luis G. Vaz Coelho, *Brazil*
Jae Gyu Kim, *Korea*
Varocha Mahachai, *Thailand*
Yaron Niv, *Israel*
Chun-Ying Wu, *Taiwan*
Yoshio Yamaoka, *Japan*
Weicheng You, *China*

TABLE OF CONTENTS

Conflict of interest declarations:

In order to help readers form their own judgments of potential bias in published abstracts, authors are asked to declare any competing financial interests.
Contributions of up to EUR 10.000 (or equivalent value in kind) per year per entity are considered “Modest”. Contributions above EUR 10.000.-per year are considered “Significant”.

Missing abstracts within the consecutive presentation numbers represent withdrawn papers.

ELECTRONIC POSTER PRESENTATIONS

ELECTRONIC POSTER ROUND 1

Diagnosis of Helicobacter infection

P01.01

PREVALENCE OF CLARITHROMYCIN RESISTANT STRAINS IN *HELICOBACTER PYLORI* POSITIVE PATIENTS AFTER COVID-19

***V. KRYVY**, I. KLYARYTSKA, T. TSAPYAK, I. ISKOVA*
Medical Academy named after S.I. Georgievsky of Vernadsky CFU, Simferopol, Russian Federation.

Aims: To examine the prevalence of clarithromycin-resistant strains of *H. pylori* in patients with peptic ulcer (PU) and chronic gastritis after coronavirus disease 2019 (COVID-19).
Methods: We studded 60 patients (mean age 32.1±6.4 years) with gastrointestinal symptoms developed after COVID-19 dividing into two groups: first - 29 patients with and second - 31 without antibacterial therapy for COVID-19. *H. pylori* infection was evaluated rapid urease test (RUT), 13C-urea breath test (13C-UBT) and ELISA (antibodies to *H. pylori* in the serum). *H. pylori* -positive status assessment as two positive tests. Resistance to clarithromycin was determined by multiplex PCR for determination of A2142G and A2143G mutations of clarithromycin-resistance *H. pylori*.
Results: DNA *H. pylori* from the gastric mucosa biopsies obtained at 93.10% (27 patients, first group) 96.44% (30 patients, second group). The resistance level in the 1-st group was 40.74% (11 patients). Isolated mutations of A2143G and A2142G determined in 2 (18.18%) and 3 (27.27%) mucosa samples, and the combination of mutations A2143G and A2142G detected in 6 (54.55%) patients. In the second group, resistance level (13.33%, 4 patients) was significantly lower compared to the first group ($p<0.05$). Isolated mutations of A2143G determined in 2 (50.0%) mucosa samples, the combination of A2143G and A2142G mutations detected in 2 (50.0%) patients.
Conclusions: A history of antibiotic therapy for CHOVID-19 is associated with a significant increase in *H. pylori* antibacterial resistance to clarithromycin.

V. Kryvy: None. I. Klyarytska: None. T. Tsapyak: None. I. Iskova: None.

P01.02

NEW RAPID *H. PYLORI* BLOOD TEST BASED ON FLID AND CAG A ANTIBODIES DETECTION

***C. SCHULZ**[1], B. KALALI[2], R. VASAPOLLI[1], L. MACKE[1], S. PAGEL-WIEDER[3], F. GESSLER[3], M. BUHLER[4], A. LINK[5], V. WEDERSHOVEN[4], M. GERHARD[2], P. MALFERTHEINER[1]*
[1]Ludwig Maximilian University Munich, Munich, Germany, [2]Technical University Munich, Munich, Germany, [3]miprolab GmbH, Göttingen, Germany, [4]ImevaX GmbH, Munich, Germany, [5]Otto von Guericke University Magdeburg, Magdeburg, Germany.

Introduction: Serology is a non-invasive diagnostic method for the detection of *a Helicobacter pylori*. Aim of our study is to report a new *H. pylori* POCT. The test is based on the detection of antibodies against*:* flagellar filament capping protein (FliD) and cytotoxin-associated antigen A (CagA).
Material and Methods: Sera from 110 patients (F 97:M 43, age 19 to 86 years) from two independent prospective cohorts were obtained. 53 patients *H. pylori* positive (based on a positive culture combined with the histological confirmation) and 58 patients *H. pylori* negative. Analysis was performed using lateral flow test. The results were assessed by visual detection of bands corresponding to FLID and CagA antigens after 20 min.

Results: The POCT showed a sensitivity of 100% and specificity of 87,9% with a accuracy of 93,7%. In parallel, whole blood samples were analysed from a subgroup with indentical results. Out of 58 *H. pylori* negative patients, the dual antigen test detected 12,1% as FLID or CagA positive. In 87,9% of patients the dual antigen test confirmed the absence of *H. pylori* infection.
Conclusion: This novel POCT shows an unmet quality of performance with an accuracy of 94%. The striking finding in our study is the sensitivity of 100 % obtained with the combined use of two antigens. Our results demonstrate the high reliablility in identifying *H. pylori* positive patients. Unless more data become available we recommend use of this POCT and address patients with a positive finding to further confirmation.

C. Schulz: None. B. Kalali: None. R. Vasapolli: None. L. Macke: None. S. Pagel-Wieder: A. Employment (full or part-time); Significant; miprolab GmbH. F. Gessler: A. Employment (full or part-time); Significant; miprolab GmbH. M. Buhler: A. Employment (full or part-time); Significant; ImevaX GmbH. A. Link: None. V. Wedershoven: A. Employment (full or part-time); Significant; ImevaX GmbH. M. Gerhard: E. Ownership Interest (stock, stock options, patent or other intellectual property); Modest; ImevaX GmbH. P. Malfertheiner: F. Consultant/Advisory Board; Modest; ImevaX GmbH.

P01.03

THE FREQUENCY OF FALSE POSITIVE *HELICOBACTER* UREASE TESTS DURING THE ROUTINE ENDOSCOPY IS NEGLIGIBLE LOW

C. THON[1], I. TAMMER[2], D. JECHOREK[3], A. AFFIFI[1], U. VON ARNIM[1], J. BORNSCHEIN[1,4], W. OBST[1], C. SCHULZ[1,5], M. VENERITO[1], J. WEIGT[1], T. WEX[1,6], P. MALFERTHEINER[1,5], ***A. LINK***[1]
[1]Department of Gastroenterology, Hepatology and Infectious Diseases, Otto-von-Guericke University Hospital, Magdeburg, Germany, [2]Institute of Medical Microbiology and Hospital Hygiene, Otto-von-Guericke University Hospital, Magdeburg, Germany, [3]Institut of Pathology, Otto-von-Guericke University Hospital, Magdeburg, Germany, [4]Translational Gastroenterology Unit, John Radcliffe Hospital, Oxford University Hospitals, NHS Trust, Oxford, United Kingdom, [5]Department of Internal Medicine II, Ludwig-Maximilians University Hospital, Munic, Germany, [6]Medical Laboratory of Clinical Chemistry, Microbiology and Infectious Diseases, Department for Molecular Genetic, Magdeburg, Germany.

Introduction: Rapid urease test (RUT) is a standard procedure for diagnosis of *Helicobacter pylori* (*H. pylori*) infection. Besides *H. pylori* there are several other bacterial species that are able to produce urease, which may theoretically lead to false positive tests. No studies have evaluated this question so far. Aim of the study was to investigate the frequency of false positive RUT results and possible influencing factors in *H. pylori* testing.
Methods: 681 patients were included in the prospective study. During upper GI endoscopy the gastric mucosa was systematically characterized for *H. pylori* infection using histological, microbiological and RUT testing. In addition, anti-*H. pylori*-IgG, anti-CagA-IgG and pepsinogen-I (PGI), pepsinogen-II (PGII) and gastrin-17 (G17) were measured in serum samples.
Results: After the exclusion of patients with incomplete or missing results (serology/RUT), 493 patients were analyzed. RUT was positive in 139 (29.2%) patients. True *H. pylori* positive RUT was observed in 136 (97.8%) of 139 patients as confirmed either by serology and/or microbiology and/or histology. False positive test was documented in 3 patients of the whole cohort (0.61%) or 0.85% of *H. pylori* negative patients. All those patients had no active gastritis or relevant preneoplastic changes and had normal G17, PGI, PGII concentration and PGI/II ratio. Those patients received a colonoscopy on the same day and potential contamination cannot be excluded retrospectively.
Conclusion: The frequency of false positive RUT is very low. The false positivity was not related to severe preneoplastic changes of gastric mucosa, but rather may be related to factors such as potential contamination.

C. Thon: None. I. Tammer: None. D. Jechorek: None. A. Affifi: None. U. von Arnim: None. J. Bornschein: None. W. Obst: None. C. Schulz: None. M. Venerito: None. J. Weigt: None. T. Wex: None. P. Malfertheiner: None. A. Link: None.

P01.04

COMPARATIVE EVALUATION OF *HELICOBACTER PYLORI* SUSCEPTIBILITY TESTING METHODS TO OPTIMIZE ROUTINE ANALYSIS

V. Y. MIENDJE DEYI[1], *A. HAMMOUTI*[2], *G. FOSSEPREZ*[3], *C. DE GIORGI*[3], *A. DEBYTTERE*[1], *M. HALLIN*[1]
[1]Laboratoire Hospitalier Universitaire de Bruxelles - Universitair Laboratorium Brussel (LHUB-ULB), Brussels, Belgium, [2]Haute Ecole Louvain en Hainaut (HELHa), Montignies sur Sambre, Belgium, [3]Haute Ecole Léonard de Vinci - Institut Paul Lambin (IPL), Brussels, Belgium.

Background: Accurate antimicrobial susceptibility testing is crucial for *Helicobacter pylori* eradication. While both agar dilution and E-test are expensive and laborious methods, disk diffusion (DD) breakpoint values have not yet been defined by EUCAST.
Objective: We compared the Kirby-Bauer method to the E-test method in order to establish reliable breakpoints and to define an optimal algorithm to accurately determine *H. pylori* susceptibility to amoxicillin, clarithromycin, levofloxacin, metronidazole, tetracycline and rifampicin.
Material and Methods: During 3 selected time periods from October 2019 to April 2021, all consecutive *H. pylori* isolated in our daily routine have been tested using both Rosco DD following manufacturer´s instructions and E-test strips following EUCAST breakpoints. For each antibiotic, the percentage of agreement was calculated and, when needed, DD modified breakpoint have been explored.
Results: A total of 580 *H. pylori* isolates have been included. Agreement between the two methods reached 98.9, 98.8, 97.8, 99.8 and 81.4% for amoxicillin, clarithromycin, levofloxacin, tetracycline and rifampicin respectively. For levofloxacin, a modified breakpoint (26 mm instead of 30) allowed a final agreement of 99.5% (Table 1). DD "false susceptible" results were < 1% for all antibiotics tested except rifampicin.
Conclusion: Apart for rifampicin, the disk diffusion method is an acceptable alternative method to routinely test *H. pylori* susceptibility. As 'false susceptible' results may occur, E-test method should be preferred in a context of treatment failure.

V.Y. Miendje deyi: None. A. Hammouti: None. G. Fosseprez: None. C. De giorgi: None. A. Debyttere: None. M. Hallin: None.

TABLE 1. CONCORDANCE BETWEEN SUSCEPTIBILITY TESTING RESULTS OBTAINED USING E-TEST AND DISK DIFFUSION METHODS FOR 580 *HELICOBACTER PYLORI* ISOLATES.

E-test	Rosco disks (Rosco, Taastrup, Denmark)					
	Amoxicillin	S (>25mm)	R (<25mm)	**Clarithromycin**	S (> 30mm)	R (< 30 mm)
MIC µg/mL (AB Biodisk, Solna, Sweden)	S (< 0.125)	574	0	S (< 0.5)	447	2
	R (> 0.125)	6	0		R (> 0.5)	5 126
	Levofloxacin	S (>30 mm) (S >26)	R (<30 mm) (R <26)	**Metronidazole**	S (>21 mm)	R (< 21 mm)
	S (< 1)	439 (429)	12 (2)	S (< 8)	279	11
	R (> 1)	1 (1)	138 (140)	R (> 8)	2	288
	Rifampicin	S (> 21 mm)	R (< 21 mm)	**Tetracycline**	S (> 30mm)	R (< 30 mm)
	S (< 1)	443	2	S (< 1)	577	0
	R (> 1)	106	29	R (> 1)	1	2

P01.05

H. PYLORI DIAGNOSTIC TESTS USED IN NAÏVE PATIENTS: RESULTS FROM THE EUROPEAN REGISTRY ON H. PYLORI MANAGEMENT (HP-EUREG)

I. PUIG[1], *D. BORDIN*[2], *A. GASBARRINI*[3], *B. TEPES*[4], *F. LERANG*[5], *G. BABAYEVA*[6], *T. ROKKAS*[7], *M. LEJA*[8], *J. KUPČINSKAS*[9], *R. M. PINTO*[10], *A. TONKIC*[11], *S. SMITH*[12], *H. SIMSEK*[13], *G. M. BUZAS*[14], *P. PHULL*[15], *O. SHVETS*[16], *M. VENERITO*[17], *D. LAMARQUE*[18], *Y. NIV*[19], *V. MILIVOJEVIC*[20], *A. CANO*[1], *O. P. NYSSEN*[21], *F. MÉGRAUD*[22], *C. O'MORAIN*[12], *J. P. GISBERT*[21], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*

[1]Althaia Xarxa Universitària Assistencial de Manresa, Manresa, Spain, [2]A.S. Loginov Moscow Clinical Scientific Center, Moscow, Russian Federation, [3]Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [4]AM DC Rogaska, Rogaska Slatina, Slovenia, [5]Østfold Hospital Trust, Grålum, Norway, [6]Azerbaijan State Advanced Training Institute for Doctors named after A.ALIYEV, Baku, Azerbaijan, [7]Henry Dunant Hospital, Athens, Greece, [8]Digestive Diseases Centre GASTRO, Institute of Clinical and Preventive Medicine & Faculty of Medicine, University of Latvia, Riga, Latvia, [9]Lithuanian University of Health Sciences, Kaunas, Lithuania, [10]Centro Hospitalar do Porto Institute of Biomedical Sciences Abel Salazar, University of Porto, CINTESIS, University of Porto, Porto, Portugal, [11]University Hospital of Split, School of Medicine, University of Split, Split, Croatia, [12]Trinity College Dublin, Dublin, Ireland, [13]Internal Medicine, Hacettepe, University School of Medicine, Ankara, Spain, [14]Ferencváros Health Centre, Budapest, Hungary, [15]Aberdeen Royal Infirmary, Aberdeen, United Kingdom, [16]National Medical University named after O.O.Bogomolets, Kyiv, Ukraine, [17]Otto-von-Guericke University, Magdeburg, Germany, [18]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [19]Rabin Medical Center, Tel Aviv University, Petah Tikva, Israel, [20]Clinical Center of Serbia and School of Medicine, University of Belgrade, Belgrade, Serbia, [21]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [22]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France.

Background: Clinical guidelines recommend the "test and treat" strategy in young patients without alarm symptoms.

Objective: To evaluate the type of tests used for the diagnosis of *H. pylori* infection in naïve patients in Europe.

Methods: International multicentre prospective European Registry on *H. pylori* Management (Hp-EuReg) collecting all adult patients where a diagnostic test was used were registered at AEG-REDCap e-CRF until February 2021.

Results: In total, 27,776 naïve patients from 20 European countries were included in the analysis (61% female, 47% <50 years). Indication for investigating *H. pylori* infection was dyspepsia in 15,947 (57%) patients, gastroduodenal ulcer in 4,498 (16%) and other symptoms in 7,304 (26%) patients. Overall, the diagnostic test used were invasive (endoscopy-based) in 19,801 out of 27,776 patients (71%), and culture was performed in 15% of them (Table 1). In patients <50 years, invasive tests were used in 65% of the cases. When each country was compared, the percentages of use of invasive tests ranged from 50% to 99% globally, and from 29% to 99% in patients <50 years (Table 2).

Conclusions: A great heterogeneity was observed among European countries in the indication of invasive tests for the diagnosis of *H. pylori* infection, both globally and in young patients.

TABLE 1. NON-INVASIVE TESTS.

NON-INVASIVE TESTS	n	%
Urea breath test	7,577	27.3%
Monoclonal stool antigen test	1,915	6.9%
Polyclonal stool antigen test	282	1.0%
Serology	1,824	6.6%
INVASIVE TESTS	19,801	71.3%
Histology	11,885	42.8%
Culture	2,927	10.5%
Rapid urease test	10,636	38.3%

I. Puig: None. D. Bordin: None. A. Gasbarrini: None. B. Tepes: None. F. Lerang: None. G. Babayeva: None. T. Rokkas: None. M. Leja: None. J. Kupčinskas: None. R.M. Pinto: None. A. Tonkic: None. S. Smith: None. H. Simsek: None. G.M. Buzas: None. P. Phull: None. O. Shvets: None. M. Venerito: None. D. Lamarque: None. Y. Niv: None. V. Milivojevic: None. A. Cano: None. O.P. Nyssen: None. F. Mégraud: None. C. O'Morain: None. J.P. Gisbert: None.

TABLE 2. N (%) OF INVASIVE TESTS USED IN EACH COUNTRY FOR THE DIAGNOSIS OF H. PYLORI INFECTION IN NA.

	All patients	Patients with invasive test		Patients <50 years with invasive test		Patients ≥50 years with invasive test	
	N	N	%	n	%	n	%
Azerbaijan	570	565	99.1	382	99.0	183	99.5
Croatia	338	277	82.0	70	70.7	207	86.6
France	107	101	94.4	46	93.9	55	94.8
Germany	132	101	76.5	40	72.7	61	79.2
Greece	541	497	91.9	184	87.2	313	94.8
Hungary	233	194	83.3	77	81.1	117	84.8
Ireland	313	221	70.6	90	54.9	131	87.9
Israel	103	59	57.3	21	40.4	38	74.5
Italy	2,629	2,213	84.2	904	80.9	1,300	87.5
Latvia	528	426	80.7	250	76.7	176	87.1
Lithuania	512	397	77.5	149	73.4	248	80.3
Norway	740	598	80.8	215	82.4	383	80.0
Portugal	347	337	97.1	103	96.3	233	97.5
Russia	5,245	3,520	67.1	1,871	65.0	1,648	69.7
Serbia	92	67	72.8	16	51.6	51	83.6
Slovenia	2,411	2,304	95.6	952	96.8	1,352	94.7
Spain	12,331	7,482	60.7	3,027	51.5	4,447	69.0
Turkey	264	247	93.6	137	91.3	110	96.5
Ukraine	145	97	66.9	51	69.9	46	63.9
United Kingdom	195	98	50.3	18	29.0	80	60.2
TOTAL	27,776	19,801	71.3%	8,603	65.3%	11,179	76.8%

P01.06

THE PATIENT EXPERIENCE AND CLINICAL EFFICACY OF A NOVEL VIRTUAL 13C-UBT SERVICE AT AN IRISH TERTIARY REFERRAL CENTER DURING THE COVID 19 PANDEMIC

***S. SIHAG**, E. OMALLAO, S. SEMENOV, D. MCNAMARA;*
Tallaght University Hospital, Dublin, Ireland.

Introduction: Urea breath test (UBT) service stopped abruptly in Ireland in March 2020 during first wave of COVID-19 due high risk of transmission. To maintain a non-invasive diagnostic option for *H. pylori* testing we developed a novel virtual test "C^{13} UBT At Home", which is performed by patients at home.

Aim and Methods: To determine the acceptability and accuracy of the novel C^{13} UBT At Home service. Patients were invited to undergo C^{13} UBT At Home.Participants were pre assessed remotely and technical aspects (internet, smart phone or laptop requirements), navigation through the video call system "attendanywhere" were discussed. Suitable patients collected a Home UBT kit and feedback questionnaire. The test performed as standard at home with live interaction over video call for all active steps. Patients requested to fill in a feedback questionnaire which included pre procedure, procedure and post procedure domains. In addition to patient satisfaction, positivity rate, sample error rate and activity numbers were compared between UBT at home and a standard UBT cohort which was reinstated in 2021.

Results: 300 patients were enrolled, mean age 41 years (range 7-85), 59% were female. Overall response 96% (288). 96% (285) rated the entire UBT at home process as either excellent or good. Accuracy between UBTs was similar: positivity rate 23% (69/299) versus 22% (74/326), sample error rate 0.33% (1/300) versus 0.6% (2/326) for the "UBT at home" and standard tests respectively.
Conclusion: UBT at home is possible and acceptable to patients with equivalent accuracy to standard UBT and should be continued to improve patient choice and satisfaction.

S. Sihag: None. E. Omallao: None. S. Semenov: None. D. McNamara: None.

P01.07

MOLECULAR DIAGNOSIS OF *HELICOBACTER PYLORI*: VALIDATION OF ALLPLEX™ *H. PYLORI* AND CLARIR ASSAY

T. YILMAZ, M. HOEBEKE, C. DECKERS, R. SOLEIMANI, O. DENIS, T. HUANG, ***P. BOGAERTS***
CHU UCL Namur, Yvoir, Belgium.

Background: In our reference national center, Amplidiag *H. pylori* + ClariR (Mobidiag) is the current ISO15189-certified assay for the detection of *H. pylori* (Hp) and its resistance to clarithromycin (ClariR) on gastric biopsies. We aimed to validate Allplex™ *H. pylori* and ClariR Assay (Seegene) according to our quality assurance rules.
Methods: Allplex and Amplidiag assays were performed according to manufacturers' instructions and ISO15189 certification requirements. Precision was assessed against an external quality assessment program (QCMD). Inter- and intra-run reproducibilities were evaluated in triplicate using three Hp-ClariR, one Hp-ClariS and one Hp-negative samples. Methods comparison was performed on consecutive gastric biopsies. Discrepancies were investigated by Hp-selective culture on biopsy specimens and by clarithromycin MIC determination using E-test (BioMérieux).
Results: Allplex reached 100% in precision and reproducibility. Compared to Amplidiag, of the 78 biopsy samples analyzed (55 Hp negative, 17 Hp ClariS, 5 Hp ClariR), 75 (96 %) were fully concordant. For the 3 discrepant results, no Hp was recovered by culture for two samples showing false-negative (FN) and false-positive (FP) Hp detection results, but one Hp isolate was grown and confirmed ClariR from the sample considered FP for ClariR (ClariS by Ampidiag).
Discussion: Amplidiag and Allplex are two robust molecular detection kits for Hp and ClariR. According to our validation/verification ISO15189 internal process, Allplex can be used as an alternative to Amplidiag. Allplex is an automated method run on Hamilton StarLet including extraction and PCR set up improving traceability.

P. Bogaerts: None. T. Yilmaz: None. M. Hoebeke: None. C. Deckers: None. R. Soleimani: None. O. Denis: None. T. Huang: None.

P01.08

COMPARISON OF HISTOLOGICAL EXAMINATION AND SEMI-QUANTITATIVE DETECTION OF *H. PYLORI* INFECTION: A PILOT STUDY

E. KOLOMINA[1]*, E. KORNIENKO*[2]*, V. PRIVOROTSKY*[2]*;*
[1]St. Petersburg State University, St. Petersburg, Russian Federation, [2]St. Petersburg State Paediatric Medical University, St. Petersburg, Russian Federation.

Introduction: The *Helicobacter pylori* infection remains a contemporary challenge in Pediatrics. ESPGHAN suggests endoscopy with histological examination with an addtional biopsy-based test, e.g., RUT to diagnose HP. Previously, RUTs could provide reliable results only qualitatively due to the subjectivity of visual color perception. Now, with the help of modern technology, the quantitative assessment of grades of urease activity, and therefore, of the HP density became possible. The aim of our study was to evaluate the correlation between results of histology and RUT obtained with the photometric device.

Materials: 44 children were enrolled: 21 m/23 f; age 12-17. The diagnostic procedure was performed in accordance with current endoscopic standards. 2 biopsy specimens from the antrum were placed separately on 2 AMA RUT Expert; the results of the RUTs were assessed using a portable photometer AMA RUT Reader. The urease activity was received in +/++/+++ grades. The RUT's were followed by a histological examination in which inflammation and atrophy were assessed.
Results: 38 children had gastroduodenitis while 29 of them had nodular antral gastritis, and 9 had duodenal bulb ulcers. 19 children had non-atrophic gastritis and 25 children had atrophic gastritis. The majority of the results were positive for HP with a high grade of urease activity. The patients with atrophic changes and enteric metaplasia of gastric mucosa had (p<0,05) a higher grade of urease activity.
Conclusions: The correlation between histological picture and results obtained with AMA RUT reader was observed. We assume semi-qualitative assessment of HP to be a helpful tool.

E. Kolomina: None. E. Kornienko: None. V. Privorotsky: None.

P01.09

HELICOBACTER PYLORI INFECTION -RELATED METABOLIC AND GASTRIC MUCOSA PRE-MALIGNANT HISTOLOGICAL PARAMETERS IN SWISS BARIATRIC PATIENTS

M. DOULBERIS[1,2,3], *A. PAPAEFTHYMIOU*[3,4], *J. KOUNTOURAS*[3], *N. T. PIERRE*[2,5], *J. KLUKOWSKA-RÖTZLER*[2], *T. KUNTZEN*[1], *S. SRIVASTAVA*[6], *A. K. EXADAKTYLOS*[2], *D. S. SRIVASTAVA*[2], *G. MANZINI*[7]
[1]Kantonsspital Aarau, Gastroenterology, Switzerland, [2]Inselspital, Emergency Department University Hospital Bern, Switzerland, [3]Aristotle University of Thessaloniki, Second Medical Clinic, School of Medicine, Greece, [4]University Hospital of Larissa, Gastroenterology, Greece, [5]Private practice, Niederbipp, Switzerland, [6]Gastroenterologie Thun, Bauch im Zentrum, Switzerland, [7]Kantonsspital Aarau, Visceral Surgery, Switzerland.

Obesity as a major risk factor of metabolic syndrome (MetS) represent a pandemic especially in Western societies with dramatic burden and consequences, since their components serve as cerebro- as well as cardiovascular risk factors. Likewise, obesity is an important risk factor for malignancies. Common denominator of both entities is *Helicobacter pylori (Hp)*, a definite carcinogen with equally global distribution. We aimed to investigate, for first time in Switzerland, the main gastric mucosa pre-malignant histological lesions of bariatric patients in correlation with components of MetS and *Hp* Infection (*Hp*-I). By means of retrospective board review of a 94304 patient cases, a total of 116 eligible patients undergone a bariatric surgery, were identified. The mean age of all patients was 48.66 years. Patients positive for *Hp*-I were found to be 28/116 (24.1%). Presence of gastric mucosa atrophy was documented in eight *Hp* (+) patients (6.8%) and two *Hp* (-) ones (p=0.006). Gastric mucosa intestinal metaplasia was observed in 14 patients of *Hp* (+) group versus three of the negative one (p<0.0001). *Hp* (+) patients exhibited statistically significant more arterial hypertension (p=0.0332). Homeostatic model of assessment insulin resistance (HOMA-IR) was also statistically significant higher for the *Hp* positive group (p<0.001). In the multivariant analysis, including as variables arterial hypertension, gastric mucosa intestinal metaplasia and atrophy, statistical significance remained only for the gastric mucosa intestinal metaplasia (p=0.001). In conclusion, *Hp*-I is associated with gastric mucosa pre-malignant histologic lesions and MetS components including arterial hypertension and IR. Further research is required to confirm these findings

M. Doulberis: None. A. Papaefthymiou: None. J. Kountouras: None. N.T. Pierre: None. J. Klukowska-Rötzler: None. T. Kuntzen: None. S. Srivastava: None. A.K. Exadaktylos: None. G. Manzini: None. D.S. Srivastava: None.

P01.10

THE PREVALENCE OF *HELICOBACTER PYLORI* INFECTION AMONG DYSPEPTIC PATIENTS IN NORTHWESTERN ROMANIA: A DECREASING EPIDEMIOLOGICAL TREND IN THE LAST 30 YEARS

A. COROJAN[1]*, D. L. UMITRASCU*[1]*, D. C. LEUCUTA*[2]*, P. CIOBANCA*[3]*;*
[1]2nd Medical DeptUniversity of Medicine and Pharmacy Cluj-Napoca, Romania, Cluj-Napoca, Romania, [2]Department of Medical Informatics and Biostatistics, Iuliu Hatieganu University of Medicine and Pharmacy Cluj-Napoca, Romania, Cluj-Napoca, Romania, [3]Salvosan Ciobanca Hospital, str. Dumbrava48, 450112Zalau, Romania, Zalau, Romania.

Background and aims: The infection with *Helicobacter pylori* (HP) has an unknown prevalence in several Romanian regions. Recent data are missing. The aim of this study was to estimate the prevalence of dyspeptic from the North-West part of Romania and to analyze the epidemiological trends of HP infection prevalence in a symptomatic population in this region of Romania by comparing with previous published data.
Methods: Our study population consisted of 414 patients: 264 F (63.8%) and 150 M (36.2%), mean age 45.89+/-17.24 years (range 6-97 years) who addressed to a single secondary center in Zalau, Salaj, North-West Romania, between 2014-2018 for dyspeptic symptoms, either from own initiative or referred by their general practitioner. Testing was performed by IgG anti-HP assessment G anti-HP antibodies.
Results: Positive antibodies were found in 169 individuals (40.8%). In females, the prevalence of HP infection was 40.53% (107/264) and in males 41.35% (62/150). There was a higher prevalence of positive antibodies in the rural areas compared to urban areas (42.29% *vs.* 39.75).
Conclusions: The prevalence of HP infection was 40.8%, without gender differences in dyspeptic patients from a representative population in North-Western Romania and the prevalence increased with age. Comparing our results with those of previous studies on the prevalence of HP infection from the same region,we were able to signal a decline in prevalence in HP infection over a 30 years interval.

A. Corojan: None. D.L. umitrascu: None. D.C. Leucuta: None. P. Ciobanca: None.

P01.11

MOLECULAR DIAGNOSIS AND HISTOPATHOLOGY: IS THERE A DIFFERENCE BETWEEN THE METHODS FOR DETECTING *HELICOBACTER PYLORI* IN SEVERE AND NON-SEVERE ESOGASTRODUODENAL LESIONS?

A. K. S. OLIVEIRA[1]*, L. L. D. SILVA*[1]*, L. R. B. DOS ANJOS*[1]*, L. D. ASSUNÇÃO*[1]*,*
D. M. M. CARDOS[2]*,* ***M. S. BARBOSA***[1]
[1]University Federal of Goiás, Goiânia, Brazil, [2]Institute of the Digestive System, Goiânia, Brazil.

Helicobacter pylori is a Gram negative bacterium considered to be the etiologic agent of several gastric diseases. The prevalence of bacterial infection varies according to age, geographic location, ethnicity and socioeconomic status. Chronic infection caused by a microorganism can favor the development of serious pathologies such as gastric adenocarcinoma. In this sense, early diagnosis is essential for a better prognosis and therapeutic success. Several diagnostic methods with different sensitivities and specificities have been used to detect *H. pylori*. This work aimed to compare the performance of the molecular and histopathological technique used in the diagnosis of *H. pylori* infection in severe and non-severe diseases. The total of 76 samples of gastric tissue were collected from dyspeptic patients undergoing molecular and histopathological diagnosis. The molecular diagnostic method based on PCR (polymerase chain reaction) detected the bacteria in 69.7% of the samples, while the histopathological examination identified the microorganism in only 38.2% of gastric biopsies. When associated with the two diagnostic techniques, the detection of the bacteria occurred in 72.4% of the samples. The segregation in severe diseases (adenocarcinoma, atrophy and metaplasia) and non-severe diseases (gastritis, esophagitis, ulcers and duodenitis) demonstrated that there is no difference in the sensitivity of the two techniques for de-

tecting the bacterium in different diseases. The PCR technique was the most efficient diagnostic method for detecting *H. pylori* regardless of the severity of the clinical outcome. The association of histopathological and molecular tests can improve the diagnostic performance of *H. pylori* infection.

M.S. Barbosa: None. A.K.S. Oliveira: None. L.L.D. Silva: None. D.M.M. Cardos: None. L.R.B. dos Anjos: None. L.D. Assunção: None.

P01.12

TWO TYPES OF AMMONIUM BREATH TEST FOR DETECTION OF *H. PYLORI* INFECTION

N. V. BARYSHNIKOVA[1,2], *Y. P. USPENSKIY*[1,3], *A. N. SUVOROV*[2];
[1]Pavlov First St-Petersburg State Medical University, St-Petersburg, Russian Federation, [2]Institution of experimental medicine, St-Petersburg, Russian Federation, [3]St-Petersburg State Pediatric Medical University, St-Petersburg, Russian Federation.

The aim: the estimation of efficacy of two types of ammonium breath test for detection of *H. pylori* infection.
Materials and methods: we used two types of ammonium breath test: Helic-ABT and Helic-scan. The diagnostic process with Helic-ABT: 1. Detection of basal level of ammonium in oral cavity; 2. Drinking of carbamide solution: 0,5 g of carbamide in 50 ml of still water; 3. Hydrolysis of carbamide by urease of *H. pylori*: (NH2)2CO + H2O ↔ 2NH3↑ + CO2↑; 4. Detection of loading level of ammonium in oral cavity. The diagnostic process with Helic-scan: 1. Drinking of carbamide solution; 2. Hydrolysis of carbamide by urease of *H. pylori*; 3. Detection of basal (first and second minutes) and loading (3th-9th minutes) levels of ammonium in oral cavity. We investigated 221 dyspeptic patients. Helic-ABT was performed for 43 patients, Helic-scan - for 104 patients. Patients during four weeks before diagnostic did not take any medications (PPIs, antibiotics, antacids and bismuth), which could change test results. For estimation of efficacy of tests, we compare they results with histological method (histological examination for *H. pylori* detection in samples obtained from the antrum and stomach body during endoscopy).
Results: *H. pylori* was positive in 147 patients (66,5%). Helic-ABT shown 92% of sensitivity and 93% specificity, Helic-scan shown 94% of sensitivity and 95% specificity. Conclusion: Both types of ammonium breath tests show the high specificity and sensitivity and can be used as non-invasive tests for diagnosis of *H. pylori* infection

N.V. Baryshnikova: None. Y.P. Uspenskiy: None. A.N. Suvorov: None.

P01.13

ACCURACY OF GASTRIC BIOPSY-BASED METHODS FOR DIAGNOSIS OF *HELICOBACTER PYLORI* INFECTION IN SYMPTOMATIC VIETNAMESE CHILDREN

T. NGUYEN CAM[1,2], *P. NGUYEN NGOC VAN*[3], *H. NGUYEN THANH*[3], *A. ROBERT*[4], *P. BONTEMS*[5,2]
[1]City Children's Hospital, Ho Chi Minh City, Viet Nam, [2]Université Libre de Bruxelles, Brussels, Belgium, [3]Pham Ngoc Thach University of Medicine, Ho Chi Minh City, Viet Nam, [4]Université Catholique de Louvain, Brussels, Belgium, [5]Hôpital Universitaire des Enfants Reine Fabiola, Brussels, Belgium.

Background: In Vietnam, diagnosis of *Helicobacter pylori (H. pylori)* infection in symptomatic children remains inconsistent due to different selection criteria. Few studies addressed the diagnostic accuracy of biopsy-based methods in children.
Aim. Assessing the accuracy of current biopsy-based tests of *H. pylori* infection in Vietnamese children.
Methods: Patients undergoing digestive endoscopy at City Children's Hospital, HoChiMinh City were enrolled. Gastric biopsies were taken for culture, rapid urease test (RUT), histology, and polymerase chain reaction (PCR) of urease gene. Culture was used as a gold standard to evaluate sensitivity, specificity, positive (PPV), negative predictive values (NPV), and accuracy of each test. Our study was approved by the Ethics Committee.

Results: We enrolled 90 patients aged 2-16 years (mean age:10 ± 2.9 years; 47 (52%) boys). Prevalence of *H. pylori* infection was 48%. As shown in Table, RUT, PCR and histology showed the high sensitivity but poor specificity (17-34%) possibly due to the low sensitivity of culture. Accuracy of RUT, PCR and histology was 57%, 59%, and 64%, respectively. A sequential strategy combining two tests showed an increased specificity to 45% for RUT and histology and to 50% for PCR and histology.
Conclusion: Diagnosis of *H. pylori* infection in symptomatic patients may be more clinically accurate when based on a combination of tests than when based on a single one in Vietnamese children to avoid overestimating the infection rate leading to unnecessary treatment.

T. Nguyen Cam: None. P. Nguyen Ngoc Van: None. H. Nguyen Thanh: None. A. Robert: None. P. Bontems: None.

TABLE 1. SUMMARY OF THE SENSITIVITY, SPECIFICITY, PPV, NPV AND ACCURACY OF RUT, PCR AND HISTOLOGY.

Methods	Sensitivity (%) (95%CI)	Specificity (%) (95%CI)	PPV (%) (95%CI)	NPV (%) (95%CI)	Accuracy (%) (95%CI)
RUT	**100** (91.8, 100)	**17** (7.7, 30.8)	**52** (49.2, 55.7)	**100**	**57** (45.8, 67.1)
PCR	**98** (87.7, 99.9)	**23** (12.3, 38.0)	**54** (49.7, 57.9)	**92** (59.7, 98.8)	**59** (48.0, 69.2)
Histology	**98** (87.7, 99.9)	**34** (20.9, 49.3)	**58** (52.3, 62.6)	**94** (68.9, 99.1)	**64** (53.7, 74.3)

ELECTRONIC POSTER ROUND 2

Treatment of Helicobacter infection

P02.01

EFFICACY OF VONOPRAZAN-BASED DUAL THERAPY AND VONOPRAZAN-BASED TRIPLE THERAPY FOR *HELICOBACTER PYLORI* ERADICATION: A PROSPECTIVE RANDOMIZED STUDY

S. RATANA-AMORNPIN[1], *R. VILAICHONE*[1], *L. SANGLUTONG*[1], *N. AUMPAN*[1], *T. EIAMSITRAKOON*[2], *S. SIRAMOLPIWAT*[2], *V. MAHACHAI*[1]

[1]Excellence Center in Digestive Diseases and Gastroenterology Unit, Department of Medicine, Faculty of Medicine, Thammasat University Hospital, Pathum Thani, Thailand, [2]Department of Medicine, Chulabhorn International College of Medicine (CICM) at Thammasat University, Pathum Thani, Thailand.

Background/Aims: Potassium-competitive acid blocker, vonoprazan, is a new potent acid blocker with limited studies for *Helicobacter pylori (H. pylori)* treatment. This study aimed to evaluate efficacy of vonoprazan-based regimens for *H. pylori* eradication.

Methods: This prospective randomized study compared *H. pylori* eradication rates between 14-day dual therapy (amoxicillin 500 mg 4 times daily and 20-mg vonoprazan twice daily), 14-day triple therapy (amoxicillin 1 g twice daily, clarithromycin-MR 1 g once daily, and 20-mg vonoprazan twice daily), 7-day high-dose vonoprazan-based triple therapy (amoxicillin 1 g twice daily, clarithromycin-MR 1 g once daily and 3 tablets of 20-mg vonoprazan once daily), and 14-day vonoprazan-based triple therapy adding bismuth (amoxicillin 1 g twice daily, clarithromycin-MR 1 g once daily, 20-mg vonoprazan, and bismuth subsalicylate 1,048 mg twice daily). Successful *H. pylori* eradication was evaluated by negative ^{13}C-UBT at least 4 weeks after treatment.

Results: Total of 100 gastritis patients (mean age of 54.3±12.8 years) were included. Antibiotic susceptibility tests showed 38% metronidazole and 15.8% clarithromycin resistance. Eradication rates of 14-day dual therapy, 14-day triple therapy, 7-day high-dose vonoprazan-based triple therapy and 14-day vonoprazan-based triple therapy adding bismuth were 66.7%, 59.3%, 92.3%, and 96.2%, respectively. There were 100% extensive metabolizer of CYP3A4. The CYP3A5 genotype revealed 43.8%, 45.8%, and 10.4% with poor, intermediate, and extensive metabolizer, respectively.

Conclusion: 7-day high-dose vonoprazan-based triple therapy and 14-day vonoprazan-based triple therapy adding bismuth can provide excellent eradication rate of *H. pylori* infection in areas with high clarithromycin resistance, regardless of CYP3A4/5 genotype.

S. Ratana-Amornpin: None. R. Vilaichone: None. L. Sanglutong: None. N. Aumpan: None. T. Eiamsitrakoon: None. S. Siramolpiwat: None. V. Mahachai: None.

P02.02

A DOUBLE-BLIND, PLACEBO-CONTROLLED, MULTICENTER STUDY OF THE EFFICACY AND SAFETY OF ALPHA-GLUTAMYL-TRYPTOPHAN IN THE TREATMENT OF CHRONIC ATROPHIC GASTRITIS, ASSOCIATED WITH *H. PYLORI*

N. V. BARYSHNIKOVA[1,2], *Y. P. USPENSKIY*[1,3], *S. V. IVANOV*[1], *A. A. GNUTOV*[3], *Z. K. GULUNOV*[3], *E. V. BALUKOVA*[4], *S. V. PETLENKO*[5], *V. V. MALININ*[5], *A. A. KRASNOV*[5], *V. A. APRYATINA*[5]

[1]Pavlov First St-Petersburg State Medical University, St-Petersburg, Russian Federation, [2]Institution of experimental medicine, St-Petersburg, Russian Federation, [3]St-Petersburg State Pediatric Medical University, St-Petersburg, Russian Federation, [4]St-Petersburg State University, St-Petersburg, Russian Federation, [5]Cytomed, St-Petersburg, Russian Federation.

Objective and aim: to evaluate the effectiveness of alpha-glutamyl-tryptophan as a cytoprotector in comparison with the control group (placebo) as part of the complex therapy of chronic atrophic H.pyroli (HP)-associated gastritis.

Materials and methods: 121 patients with chronic atrophic HP-associated gastritis were observed in 5 research centers. Before and after treatment blood test "Gastropanel", stomach endoscopy with biopsies of atrophied mucosa for histological examination, rapid urease test for *H. pylori* detection, daily pH-metry were performed.
Treatment: a standard course of eradication therapy with Omeprazole 20 mg 2 times a day 10 days; amoxicillin 1000 mg 2 times a day for first 5 days; clarithromycin 500 mg 2 times a day for next 5 days. After HP eradication, according to randomization, the study drug (n=61) or placebo (n=60) was administered twice a day, in the morning 20-30 minutes before meals and in the evening before bedtime for 28 days.
Results: alpha-glutamyl-tryptophan intake associate with statistically significant increase of acidity index according to pH-metry (z = 3.284391; *p* = 0.001022), increase in the ratio of pepsinogen I/pepsinogen II (z = 2.953706; *p* = 0.003140), decrease in the level of gastrin-17(z = 2.781678; *p* = 0.005408), increase in the number of glands per 1 mm2 of the gastric mucosa (z = 2,198078; *p* = 0,027944), decrease of inflammation in stomach mucosa versus placebo.
Conclusions: alpha-glutamyl-tryptophan in the treatment of chronic atrophic HP-associated gastritis has superior regenerative and anti-inflammatory efficacy, compared with placebo, promotes the restoration of acid-forming and pepsin-forming functions of the stomach.

N.V. Baryshnikova: None. Y.P. Uspenskiy: None. S.V. Ivanov: None. A.A. Gnutov: None. Z.K. Gulunov: None. E.V. Balukova: None. S.V. Petlenko: None. V.V. Malinin: None. A.A. Krasnov: None. V.A. Apryatina: None.

P02.04

A MULTICENTER STUDY ON THE PAST USE OF METRONIDAZOLE AND THE SUCCESS RATE OF ERADICATION OF *HELICOBACTER PYLORI*

Y. CHOE[1]*, J. KIM*[1]*, J. PARK*[2]*, B. KIM*[1]*, S. KIM*[3]*, J. OH*[4]*, D. CHEUNG*[5]*, T. KIM*[6]*, D. KIM*[7]*, H. CHOI*[3]
[1]Division of Gastroenterology and Hepatology, Department of Internal Medicine, Incheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [2]Division of Gastroenterology and Hepatology, Department of Internal Medicine, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [3]Division of Gastroenterology and Hepatology, Department of Internal Medicine, Uijeongbu St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [4]Division of Gastroenterology and Hepatology, Department of Internal Medicine, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [5]Division of Gastroenterology and Hepatology, Department of Internal Medicine, Yeouido St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [6]Division of Gastroenterology and Hepatology, Department of Internal Medicine, Bucheon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of, [7]Division of Gastroenterology and Hepatology, Department of Internal Medicine, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea, Republic of.

Background: Bismuth quadruple therapy (BQT) is recommended as empirical first line therapy for *Helicobacter pylori* in many guidelines as it is not affected by antibiotic resistance. Our aim was to examine exposure to metronidazole and its impact on BQT efficacy.
Methods: Patients who received BQT for *H. pylori* treatment were searched at 7 university hospitals from 2009 to 2020. Previous exposure to metronidazole was examined. The association between exposure to metronidazole and eradication success was assessed.
Results: We identified 37,602 subjects who were diagnosed with *H. pylori* infection, and 7,233 received BQT. 2,802 (38.7%) underwent 13C-urea breath test to confirm eradication. The efficacy of BQT was 86.4% and 72.8% in patients with and without metronidazole exposure (odds ratio [OR], 2.37; 95% confidence interval [CI], 1.64-3.43; *p*<0.001). For subjects exposed to metronidazole, the eradication rates of 14-day BQT and 7- or 10-day BQT were 85.5% vs. 66.0% (OR, 3.02; 95% CI, 1.29-.7.10; *p*=0.009). Multivariate analysis revealed previous exposure to metronidazole (OR, 2.40; 95% CI, 1.66-3.48; *p*<0.001) and treatment with BQT for less than 14 days (OR,1.63; 95% CI, 1.26-2.11; *p*<0.001) as risk factors for eradication failure.
Conclusions: Previous exposure to metronidazole significantly lowered the eradication success rate of BQT. 14-day BQT should be recommended in patients suspected with previous exposure to metronidazole.

Y. Choe: None. J. Kim: None. J. Park: None. B. Kim: None. S. Kim: None. J. Oh: None. D. Cheung: None. T. Kim: None. D. Kim: None. H. Choi: None.

TABLE 1. SUCCESS RATE OF ERADICATION OF *HELICOBACTER PYLORI* OF BISMUTH QUADRUPLE THERAPY WITH OR WITHOUT PREVIOUS METRONIDAZOLE EXPOSURE.

	With exposure to metronidazole	Without exposure to metronidazole	*p*-value
Success rate of eradication	115/158 (72.8)	2284/2644 (86.4)	<0.001
7-,10-day BQT	68/103 (66.0)	1643/1926 (85.3)	<0.001
14-day BQT	47/55 (85.5)	641/718 (89.3)	0.383

Data represent the number of patients (%). BQT, bismuth quadruple therapy

P02.05

TREATMENTS AFTER FAILED THERAPY IN *H. PYLORI* INFECTED CHILDREN IN EUROPE: RESULTS OF THE EUROPEDHP REGISTRY

T. LE THI[1], *K. WERKSTETTER*[1], *J. CABRAL*[2], *K. KOTILEA*[3], *P. BONTEMS* [3], *J. BARRIO*[4], *M. CILLERUELO PASCUAL*[5], *M. HOMAN*[6], *M. KORI*[7], *P. URRUZUNO*[8], *N. KALACH*[9], *Z. MISAK*[10], *M. TAVARES*[11,12], *E. MIELE*[13], *V. URBONAS*[14], *A. CHIARO*[15,16], *A. PAPADOPOULOU*[17], *J. SYKORA*[18], *A. KRAHL*[19], *K. MATUSIEWICS*[20], *M. KORKUT UGRAS*[21], *F. REA*[22], *T. CASSWALL*[23], *M. KLEMENAK*[24], *A. CSEH*[25], *J. DE LAFFOLIE*[26], *M. ROGALIDOU*[27], *A. LOPES*[28], *H. BANOUB*[29], *S. KOLETZKO*[1,30], *ON BEHALF OF THE H. PYLORI WORKING GROUP OF ESPGHAN;*

[1]Dr. von Hauner Children's Hospital, Medical center of the University of Munich, MÜNCHEN, Germany, [2]Dona Estefânia Hospital, University Hospital Centre of Central Lisbon, Lisbon, Portugal, [3]Université Libre de Bruxelles, Hôpital Universitaire des Enfants Reine Fabiola, Pediatric Gastroenterology-Hepatology, Brussels, Belgium, [4]Hospital Universitario de Fuenlabrada Madrid, Madrid, Spain, [5]University Hospital Puerta de Hierro Majadahonda, Madrid, Spain, [6]University Children's Hospital, Faculty of Medicine, University of Ljubljana, Ljubljana, Slovenia, [7]Kaplan Medical Center, Rehovot, Israel, [8]Hospital 12 de Octobre, Madrid, Spain, [9]Saint Antoine Pediatric Clinic, Saint Vincent de Paul Hospital, Catholic University, Lille, France, [10]Children's Hospital Zagreb, University of Zagreb, Zagreb, Croatia, [11]Centro Materno Infantil do Norte, Porto Hospital Center, Porto, Portugal, [12]Hospital Sao Joao, Porto, Portugal, [13]University of Naples "Federico II", Naples, Italy, [14]Clinic of Children's Diseases of Vilnius University, Vilnius, Lithuania, [15]Giannina Gaslini Children's Hospital and Research Institute, Genoa, Italy, [16]Department of Pediatrics, "Maggiore" Hospital, Crema, Italy, [17]University of Athens, Athens Children's Hospital "Agia Sofia", Athens, Greece, [18]Prof Charles University of Prague, Pilsen, Czech Republic, [19]Darmstädter Kinderkliniken Prinzessin Margaret, Darmstadt, Germany, [20]Department of Pediatrics, Gastroenterology and Nutrition, Wroclaw Medical University, Wroclaw, Poland, [21]Yeditepe University Medical Faculty, Istanbul, Turkey, [22]Digestive Endoscopy and Surgery Unit, Bambino Gesù Children's Hospital, Rome, Italy, [23]Karolinska University Hospital, Stockholm, Sweden, [24]University Medical Centre Maribor, Maribor, Slovenia, [25]Department of Pediatrics , Semmelweis University, Budapest, Hungary, [26]University Children's Hospital of Giessen, Giessen, Germany, [27]University Hospital of Ioannina, Pediatrics Department & Ped. Gastroenterology, Ioannina, Greece, [28]Hospital Santa Maria, Medical Faculty, University of Lisbon, Lisbon, Portugal, [29]Queen Mary's Hospital for Children, Carshalton, United Kingdom, [30]Department of Pediatrics, Gastroenterology and Nutrition, School of Medicine Collegium Medicum University of Warmia and Mazury, Olsztyn, Poland.

Aims: To evaluate eradication rates (ER) of treatments recommended by ESPGHAN/NASPGHAN Guidelines *(JPGN 2017;64: 991-1003)* in *H. pylori* infected children after failed therapy.
Methods: From 2017 to 2020, 30 centers from 17 European countries prospectively reported demographic, clinical and follow-up data of *H. pylori* infected children. For this sub-analysis, we included all children with biopsy proven infection after at least one treatment failure, who were monitored for eradication success 4 to 8 weeks after completed rescue therapy.

Results: Of 191 included children, 59 (31%) were lost to follow up, leaving 132 for analysis (56% female, median age 12.8 years). Endoscopy revealed ulcers in 8 patients, erosions in 22. Antibiotic susceptibility was available in 102 cases showing resistance to CLA, MET or both antibiotics in 51%, 40% and 27%, respectively. The overall ER was 64% (85/132), 95%CI: 56%-73%, *p*=0.0009 (Table 1). Two weeks triple therapy tailored to antibiotic susceptibility showed low ERs for PAC (14/27; 52%) and for PAM (26/39; 67%). ER improved with higher amoxicillin doses and drug adherence. Bismuth based therapy was successful in 80%, including 8/10 with double resistance.
Conclusions: In children with previously failed therapy, low ER with standard triple therapy tailored to antibiotic suscpeptibility are likely due to missed resistant strains. Our data suggests that higher amoxicillin doses or bismuth-based regimens with optimized compliance are best options for treatment success.

T. Le Thi: None. K. Werkstetter: None. J. Cabral: None. K. Kotilea: None. P. Bontems : None. J. Barrio: None. M. Cilleruelo Pascual: None. M. Homan: None. M. Kori: None. P. Urruzuno: None. N. Kalach: None. Z. Misak: None. M. Tavares: None. E. Miele: None. V. Urbonas: None. A. Chiaro: None. A. Papadopoulou: None. J. Sykora: None. A. Krahl: None. K. Matusiewics: None. M. Korkut Ugras: None. F. Rea: None. T. Casswall: None. M. Klemenak: None. A. Cseh: None. J. de Laffolie: None. M. Rogalidou: None. A. Lopes: None. H. Banoub: None. S. Koletzko: None.

TABLE 1. ER OF 4 TREATMENT REGIMENS PRESCRIBED TO H. PYLORI INFECTED CHILDREN AFTER FAILED THERAPY.

Factors ER in % (E/N)	All patients in the sub-analysis	Triple PPI + AMO + CLA (PAC)	Triple PPI + AMO + MET (PAM)	Triple PPI + AMO + other antibiotic	Bismuth based therapy (BMT)
Overall	64% (85/132)	47% (16/34)	72% (42/58)	67% (10/15)	80% (12/15)
Number of previous failed treament					
1	67% (62/92)	46% (11/24)	76% (35/46)	71% (5/7)	90% (9/10)
>=2	58% (23/40)	50% (5/10)	58% (7/12)	63% (5/8)	60% (3/5)
Susceptibility groups					
MET-S/CLA-S	67% (24/36)	60% (12/20)	71% (10/14)	-	-
MET-S/CLA-R	72% (18/25)	-	71% (15/21)	100% (2/2)	-
MET-R/CLA-S	50% (7/14)	29% (2/7)	33% (1/3)	100% (1/1)	100% (2/2)
MET-R/CLA-R	56% (15/27)	-	25% (1/4)	60% (6/10)	80% (8/10)
Amoxicillin high dose according to guidelines					
Yes	75% (41/55)	64% (7/11)	81% (21/26)	83% (5/6)	78% (7/9)
No (lower)	55% (38/69)	39% (9/23)	66% (21/32)	63% (5/8)	100% (2/2)
Compliance to therapy					
Excellent 90-100%	72% (76/105)	56% (15/27)	79% (37/47)	90% (9/10)	85% (11/13)
Lower than 90%	28% (5/18)	0% (0/4)	43% (3/7)	0% (0/3)	50% (1/2)

P02.06

FIRST-LINE EMPIRICAL THERAPY FOR THE ERADICATION OF *H. PYLORI* IN ITALY: DATA ON EFFECTIVENESS FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

L. GATTA[1], *G. FIORINI*[2], *I. SARACINO*[2], *M. PAVONI*[2], *M. ROMANO*[3], *A. GRAVINA*[3], *L. GRANATA*[3], *R. PELLICANO*[4], *A. GASBARRINI*[5], *A. DI LEO*[6], *G. LOSURDO*[6], *F. FRANCESCHI*[7], *G. NARDONE*[8], *A. ROCCO*[8], *M. P. DORE*[9], *F. FARINATI*[10], *M. GHISA*[10], *I. PUIG*[11], *O. P. NYSSEN*[12], *F. MÉGRAUD*[13], *C. O'MORAIN*[14], *D. VAIRA*[2], *J. P. GISBERT*[12]

[1]Versilia Hospital, Lido di Camaiore, Italy, [2]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [3]Università degli Studi della Campania "Luigi Vanvitelli", Naples, Italy, [4]Molinette-SGAS Hospital, University of Turin, Turin, Italy, [5]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [6]University Hospital Policlinico Consorziale, Bari, Italy, [7]Emergency Medicine, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [8]Gastroenterology Unit, Department of Clinical

Medicine and Surgery, University Federico II of Naples, Naples, Italy, [9]Department of Medical, Surgical and Experimental Science, University of Sassari, Sassari, Italy, [10]Gastroenterology Unit, Department of Surgery, Oncology and Gastroenterology, University Hospital of Padua, Padua, Italy, [11]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [12]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [13]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, Spain, [14]Trinity College Dublin, Dublin, Ireland.

Introduction: It is not yet clear what is the best first-line empirical therapy in patients with *H. pylori* infection.

Aims & Methods: To assess the effectiveness of empirical first-line treatments prescribed in Italy evaluating the European Registry on *H. pylori* Management (Hp-EuReg). The Hp-EuReg is an international multicentre prospective non-interventional registry recording information of *H. pylori* infection management since 2013. Data of all *H. pylori* positive naïve patients enrolled from 2013 to March 2021 by Italian centres participating to the Hp-EuReg, were analysed. Effectiveness was evaluated according to the intention to treat (ITT), modified intention to treat (mITT), and per protocol (PP) analysis.

Results: 2,996 patients were analysed: mean age was 52 years (SD ± 5), and 61% were women. 1.1% of the cases were allergic to penicillin. Among those non-allergic to penicillin, sequential therapy was most commonly prescribed (57%), followed by the single capsule bismuth quadruple therapy (Pylera®) (20%), 10 or 14-day non-bismuth concomitant treatment (10%), 7 or 10-day triple therapy with proton pump inhibitor (PPI), amoxicillin (A) and clarithromycin (5%), and 10 or 14-day triple therapy with PPI, A, and levofloxacin (2%). Eradication rates are reported in Table 1.

Conclusions: Among the first-line empiric treatments prescribed by the Italian centres participating to the Hp-EuReg, only single capsule bismuth quadruple therapy (Pylera®), sequential, and non-bismuth concomitant therapy, were able to achieve over 90% eradication rates.

L. Gatta: None. G. Fiorini: None. I. Saracino: None. M. Pavoni: None. M. Romano: None. A. Gravina: None. L. Granata: None. R. Pellicano: None. A. Gasbarrini: None. A. Di Leo: None. G. Losurdo: None. F. Franceschi: None. G. Nardone: None. A. Rocco: None. M.P. Dore: None. F. Farinati: None. M. Ghisa: None. I. Puig: None. O.P. Nyssen: None. F. Mégraud: None. C. O'Morain: None. D. Vaira: None. J.P. Gisbert: None.

TABLE 1. EFFECTIVENESS BY INTENTION TO TREAT (ITT), MODIFIED INTENTION TO TREAT (MITT), AND PER PROTOCOL (PP) ANALYSIS OF FIRST-LINE EMPIRICAL TREATMENTS.

First-line treatment	Length (days)	ITT		mITT		PP	
		N	%(95% CI)	N	%(95% CI)	N	%(95% CI)
Sequential (PPI + C-A-T/M)	10	1,634	81.8 (79.9 to 83.6)	1,487	91.3(89.8 to 92.7)	1,474	91.8%(90.3 to 93.1)
	14	1	100(20.7 to 100)	1	100(20.7 to 100)	1	100(20.7 to 100)
PPI + Pylera® (M+Tc+B)	10	528	87.1(84.0 to 89.7)	496	94.6(92.2 to 96.2)	480	96.5(94.4 to 97.8)
Concomitant (PPI + C-A-M/T)	10	108	87.0(79.4 to 92.1)	102	92.2(85.3 to 96.9)	98	94.9(88.6 to 97.8)
	14	153	93.5(88.4 to 96.4)	168	95.2(90.9 to 97.6)	165	97.0 (93.1 to 98.7)
Triple PPI-C-A	7	75	77.3%(66.7 to 85.3)	69	84.1%(73.7. to 90.9)	67	85.1(74.7 to 91.7)
	10	68	61.8(49.9 to 72.4)	53	83.0(70.8 to 90.8)	51	84.3(72.0 to 91.8)
	14	5	100(56.6 to 100)	5	100(56.6 to 100)	5	100(56.6 to 100)
Triple PPI-A-L	7	1	0(0 to 79.3)	1	0(0 to 79.3)	1	0(0 to 79.3)
	10	42	81.0(66.7 to 90.0)	50	86.0(73.8 to 93.0)	48	87.5(75.3 to 94.1)
	14	1	100(20.7 to 100)	1	100(20.7 to 100)	1	100(20.7 to 100)

ITT (patients with at least a 6-month follow-up; lost to follow-up considered treatment failures), mITT (patients that completed follow-up), and PP analysis (patients that completed follow-up and took at least 90% of medications).N: total number of patients treated; A, amoxicillin; B, bismuth salt; C, clarithromycin; L, levofloxacin; M, metronidazole; PPI, proton pump inhibitor; T, tinidazole; Tc, tetracycline.

P02.07

SECOND-LINE EMPIRICAL THERAPY FOR THE ERADICATION OF *H. PYLORI* IN ITALY: DATA ON EFFECTIVENESS FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

L. GATTA[1], *G. FIORINI*[2], *I. M. SARACINO*[2], *M. PAVONI*[2], *M. ROMANO*[3], *A. GRAVINA*[3], *L. GRANATA*[3], *R. PELLICANO*[4], *A. GASBARRINI*[5], *A. DI LEO*[6], *G. LOSURDO*[6], *F. FRANCESCHI*[7], *G. NARDONE*[8], *A. ROCCO*[8], *M. P. DORE*[9], *F. FARINATI*[10], *M. GHISA*[10], *I. PUIG*[11], *O. P. NYSSEN*[12], *F. MÉGRAUD*[13], *C. O'MORAIN*[14], *D. VAIRA*[2], *J. P. GISBERT*[12], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*

[1]Versilia Hospital, Gastroenterology Unit, Lido di Camaiore, Italy, [2]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [3]Università degli Studi della Campania "Luigi Vanvitelli", Naples, Italy, [4]Molinette-SGAS Hospital, University of Turin, Turin, Italy, [5]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [6]University Hospital Policlinico Consorziale, Bari, Italy, [7]Emergency Medicine, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [8]Gastroenterology Unit, Department of Clinical Medicine and Surgery, University Federico II of Naples, Naples, Italy, [9]Department of Medical, Surgical and Experimental Science, University of Sassari, Sassari, Italy, [10]Gastroenterology Unit, Department of Surgery, Oncology and Gastroenterology, University Hospital of Padua, Padua, Italy, [11]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [12]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [13]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [14]Trinity College Dublin, Dublin, Ireland.

Background: With the current therapies, approximately 10-20% of empirically treated naïve patients fail to eradicate *H. pylori* infection.

Aims & Methods: To assess the effectiveness of empirical second-line treatments prescribed in Italy evaluating the European Registry on *H. pylori* Management (Hp-EuReg). The Hp-EuReg is an international multicentre prospective non-interventional registry recording information of *H. pylori* infection management since 2013. Data of all *H. pylori* positive patients who were empirically prescribed a second-line therapy, enrolled from 2013 to March 2021 by Italian centres participating to the Hp-EuReg, were analysed. Effectiveness was evaluated according to the intention to treat (ITT), modified intention to treat (mITT), and per protocol (PP) analysis.

TABLE 1. EFFECTIVENESS BY INTENTION TO TREAT (ITT), MODIFIED INTENTION TO TREAT (MITT), AND PER PROTOCOL (PP) ANALYSIS OF SECOND-LINE EMPIRICAL TREATMENTS.

Second-line treatment	Length (days)	ITT		mITT		PP	
		N	%(95% CI)	N	%(95% CI)	N	%(95% CI)
Triple PPI-A-L	7	2	100(34.2 to 100)	2	100(34.2 to 100)	2	100(34.2 to 100)
	10	188	74.5(67.8 to 80.2)	165	84.8(78.6 to 89.5)	165	84.8(78.6 to 89.5)
	14	6	100(61.0 to 100)	6	100(61.0 to 100)	6	100(61.0 to 100)
PPI + Pylera® (M+Tc+B)	7	1	0(0.0 to 79.3)	1	0(0.0 to 79.3)	1	0(0.0 to 79.3)
	10	159	83.6(77.1 to 86.6)	149	91.9(86.5 to 95.3)	147	92.5(87.1 to 95.8)
	14	1	100(20.7 to 100)	1	100(20.7 to 100)	1	100(20.7 to 100)
Sequential (PPI + C-A-T/M)	10	66	71.2(59.4 to 80.7)	61	78.7(66.9 to 87.1)	70	78.3(66.4 to 86.9)
	14	1	100(20.7 to 100)	1	100(20.7 to 100)	1	100(20.7 to 100)
Concomitant (PPI +C-A-M/T)	10	26	69.2(50.0 to 83.5)	25	72(52.4 to 85.7)	25	72(52.4 to 85.7)
Triple PPI-R-A	10	9	100(70.1 to 100)	10	90(59.6 to 98.2)	10	90(59.6 to 98.2)

ITT (patients with at least a 6-month follow-up; lost to follow-up considered treatment failures), mITT (patients that completed follow-up), and PP analysis (patients that completed follow-up and took at least 90% of medications).N: total number of patients treated; ITT: intention-to-treat; mITT: modified intention-to-treat; PP, per protocol; A, amoxicillin; B, bismuth salt; C, clarithromycin; L, levofloxacin; M, metronidazole; PPI, proton pump inhibitor; R, rifabutin; T, tinidazole; Tc, tetracycline.

Results: 727 patients were included for analysis: mean age was 51 years (SD ± 14.3), and 60.9% of patients were women. 2.2% of the overall patients were allergic to penicillin. Among patients not allergic to penicillin, triple therapy with levofloxacin was most commonly prescribed (31%), followed by single capsule bismuth quadruple therapy (Pylera®) (28.5%), concomitant therapy (26.4%), rifabutin triple therapy (20%), and sequential therapy (11%).
Conclusions: Among the second-line treatments empirically prescribed by Italian centres participating to the Hp-EuReg, single capsule bismuth quadruple therapy (Pylera®) lasting 10 days achieved the highest eradication rate.

L. Gatta: None. G. Fiorini: None. I.M. Saracino: None. M. Pavoni: None. M. Romano: None. A. Gravina: None. L. Granata: None. R. Pellicano: None. A. Gasbarrini: None. A. Di Leo: None. G. Losurdo: None. F. Franceschi: None. G. Nardone: None. A. Rocco: None. M.P. Dore: None. F. Farinati: None. M. Ghisa: None. I. Puig: None. O.P. Nyssen: None. F. Mégraud: None. C. O'Morain: None. D. Vaira: None. J.P. Gisbert: None.

P02.08

QUADRUPLE HYBRID THERAPY AS FIRST-LINE REGIMEN FOR *HELICOBACTER PYLORI* ERADICATION IN A HIGH CLARITHROMYCIN RESISTANCE COUNTRY: THE IMPORTANCE OF A CLOSE MEDICAL-PATIENT RELATIONSHIP

*N. P. ALMEIDA[1,2], **C. CORREIA**[1], J. ESTORNINHO[1], M. FERREIRA[2], C. A. CALHAU[1], M. M. DONATO[2], P. N. FIGUEIREDO[1,2]*
[1]Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal, [2]Faculty of Medicine, University of Coimbra, Coimbra, Portugal.

Background: Standard triple therapy is no longer acceptable in patients with high *Helicobacter pylori* (*H. pylori*) resistance to clarithromycin. Quadruple therapies must be the first choice, but there are few data available about quadruple hybrid therapy. We evaluated the success of such treatment in a cohort of patients followed by a single Gastroenterologist largely dedicated to this pathology.
Methods: This was a retrospective study that included 91 treatment-naïve patients (male-53.8%; mean age-53.2±16.2 years) diagnosed with *H. pylori* infection by positive histology and/or urea breath test (UBT). Dyspepsia was the main indication for treatment-66.3%. The hybrid therapy consisted of 40 mg esomeprazole(b.i.d.) and 1 g amoxicillin(12/12h) for 14 days, with the addition of 500 mg clarithromycin(12/12h) and 500 mg metronidazole(8/8h) for the final 7 days. All patients received detailed oral and written information about the treatment, potential side effects and interactions. Eradication was defined by negative UBT or histology.
Results: The eradication rates were 92.3% (84/91; 95%CI 84.9-96.2%) by intention-to-treat and 95.3% (82/86; 95%CI 88.6-98.1%) by per-protocol analysis. Compliance rate was 94.5% and adverse events occurred in 27.5%, mainly mild (14/25), being dysgeusia the most frequent (19/25). Only 3.3% of patients presented severe adverse events. No compliance (40% vs 5.8%; p=0.046) and diarrhea (as secondary effect (44% vs 0%; p=0.01) were associated with unsuccessful treatment.
Conclusions: Quadruple hybrid therapy is an effective and safe first-line regimen in countries with high *H. pylori* resistance to macrolides. A close relationship between the doctor and his patients could increase compliance and consequently the eradication efficacy.

N.P. Almeida: D. Speakers Bureau/Honoraria (speakers bureau, symposia, and expert witness); Modest; Allergan. C. Correia: None. J. Estorninho: None. M. Ferreira: None. C.A. Calhau: None. M.M. Donato: None. P.N. Figueiredo: None.

P02.09

AN OBSERVATIONAL REAL-LIFE STUDY EVALUATING THE EFFICACY OF 10 AND 14-DAYS CONCOMITANT THERAPY SUPPLEMENTED WITH PROBIOTICS FOR *H. PYLORI* ERADICATION IN NAÏVE PATIENTS IN A HIGH CLARITHROMYCIN AND METRONIDAZOLE RESISTANCE AREA

***K. PRIADKO**, L. GRANATA, R. CERBONE, A. SANTONASTASO, N. DE GENNARO, E. SCOTTO DI VETTA, A. MIRANDA, A. G. GRAVINA, M. ROMANO*
Università degli Studi della Campania "L. Vanvitelli", Napoli, Italy.

Background: Concomitant therapy (CT) has demonstrated to overcome the problem of Clarithromycin (CLA) resistance, while its efficacy in regions with high CLA and Metronidazole (dual) resistance is still debated. The duration of therapy (10 days(10dCT) vs 14 days(14dCT)) and the role of probiotics supplementation in reducing treatment-related adverse events (TRAEs), are still questioned.
Objective: To compare the efficacy and safety of 10dCT vs 14dCT supplemented with probiotics in *H. pylori*-infected treatment-naïve subjects in a region with high dual resistance.
Method: We enrolled 240 *H. pylori*-infected subjects naïve to treatment. *H. pylori* infection was established via ^{13}CUrea Breath Test (^{13}CUBT), HpSA or histology. CT was as follows: Esomeprazole 40mg bid + CLA 500mg bid+ Tinidazole 500mg bid + Amoxicillin 1g bid + *Lactobacillus paracasei* formulation (Enterolactis plus®) bid. Hundred patients received 10dCT and 140 were prescribed 14dCT. Treatment efficacy was assessed at least 4 weeks after treatment completion by ^{13}CUBT. TRAEs were evaluated via questionnaire at the end of therapy.
Results: 1)10dCT-related ITT and PP eradication rates were 80/100 (80%;95%CI 70.8-87.3%) and 80/94 (85.1%;95%CI 76.3-91.6%), respectively; 2) 14dCT- related ITT and PP eradication rates were 133/140 (95%;95%CI 89.97%-97.97%%) and 131/140 (93.5%;95%CI
88.06%-96.97%), respectively; 3)14dCT was significantly superior to 10dCT (p<0.01); 4) Compliance to treatment was over 95% with a prevalence of TRAEs of 20.4%.
Conclusion: 14dCT supplemented with probiotics in an area of high dual resistance, in *H. pylori*-infected subjects naïve to treatment: 1) achieves eradication rates over 90%; 2) is associated with an excellent compliance and a low rate of TRAEs.

K. Priadko: None. L. Granata: None. R. Cerbone: None. A. Santonastaso: None. N. De Gennaro: None. E. Scotto di Vetta: None. A. Miranda: None. A.G. Gravina: None. M. Romano: None.

P02.10

PRIMARY ANTIMICROBIAL RESISTANCE TREND IN ITALIAN *H. PYLORI* NAÏVE PATIENTS BETWEEN 2013-2020: ANALYSIS OF THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

***L. GATTA**[1], G. FIORINI[2], I. M. SARACINO[2], M. PAVONI[2], M. ROMANO[3], A. GRAVINA[3], L. GRANATA[3], R. PELLICANO[4], A. GASBARRINI[5], A. DI LEO[6], G. LOSURDO[6], F. FRANCESCHI[7], G. NARDONE[8], A. ROCCO[8], M. P. DORE[9], F. FARINATI[10], M. GHISA[10], I. PUIG[11], O. P. NYSSEN[12], F. MÉGRAUD[13], C. O'MORAIN[14], D. VAIRA[2], J. P. GISBERT[12], ON BEHALF OF THE HP-EUREG INVESTIGATORS*
[1]Gastroenterology Unit, Versilia Hospital, Lido di Camaiore, Italy, [2]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [3]Università degli Studi della Campania "Luigi Vanvitelli", Naples, Italy, [4]Molinette-SGAS Hospital, University of Turin, Turin, Italy, [5]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [6]University Hospital Policlinico Consorziale, Bari, Italy, [7]Emergency Medicine, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [8]Gastroenterology Unit, Department of Clinical Medicine and Surgery, University Federico II of Naples, Naples, Italy, [9]Department of Medical, Surgical and Experimental Science, University of Sassari, Sassari, Italy, [10]Gastroenterology Unit, Department of Surgery, Oncology and Gastroenterology, University Hospital of Padua, Padua, Italy,

[11]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [12]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [13]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [14]Trinity College Dublin, Dublin, Ireland.

Background: Bacterial antibiotic resistances to *H. pylori* can change over the time. It is therefore mandatory to perform periodic assessment of their prevalence.
Aims & Methods: Performing a time-trend analysis of the primary resistance in Italy evaluating the European Registry on *H. pylori* Management (Hp-EuReg). Data of all *H. pylori* positive naïve patients enrolled from 2013 to March 2021 by Italian centres in the Hp-EuReg with a result of the antibiotic resistance test were assessed.
Results: 1,556 patients were evaluated: mean age was 51 years (SD ± 15), and 64% were women. Resistance rates are reported in Table 1. Resistance to clarithromycin (Cla) was 32.1%, to metronidazole (Metro) 33.9%, and to levofloxacin (Levo) 29.2%. 18.8% of strains were resistant to both Cla and Metro, whilst 10.3% was resistant to Cla, Metro, and Levo. A significant decrease in the single Cla, Metro, and Levo resistance was observed between 2013 and 2020 (p<0.01), as well as in the prevalence of dual (Cla+ Metro) or triple (Cla+ Metro + Levo) bacterial resistance (p<0.001).
Conclusions: Although there is a trend towards a decreasing overall bacterial resistance, more than half of the Italian patients included in the Hp-EuReg reported one or more resistance to the antimicrobials tested. Furthermore, the overall prevalence of resistances remains high, being above 30% for the Cla or Metro, and nearly 30% for Levo.

L. Gatta: None. G. Fiorini: None. I.M. Saracino: None. M. Pavoni: None. M. Romano: None. A. Gravina: None. L. Granata: None. R. Pellicano: None. A. Gasbarrini: None. A. Di Leo: None. G. Losurdo: None. F. Franceschi: None. G. Nardone: None. A. Rocco: None. M.P. Dore: None. F. Farinati: None. M. Ghisa: None. I. Puig: None. O.P. Nyssen: None. F. Mégraud: None. C. O'Morain: None. D. Vaira: None. J.P. Gisbert: None.

TABLE 1. PREVALENCE OF STRAINS NOT RESISTANT AND RESISTANT TO DIFFERENT ANTIMICROBIAL AGENTS BETWEEN 2013 AND 2020 IN NAÏVE PATIENTS ENROLLED IN THE ITALIAN CENTRES PARTICIPATING TO THE HP-EUREG.

	2013	2014	2015	2016	2017	2018	2019	2020	Overall
Number of cultures	145	186	261	162	273	236	171	121	1,556
Strains without resistance	37.2%	42.5%	39.8%	38.9%	57.1%	47%	45%	52.9%	45.5%
C-R	32.4%	37.1%	37.9%	40.1%	24.2%	27.1%	31%	28.1%	32.1%
M-R	50.3%	36.6%	41.8%	38.3%	23.1%	27.5%	31%	29.8%	33.9%
L-R	29.7%	34.9%	35.6%	37%	23.4%	27.5%	25.7%	16.5%	29.2%
A-R	0%	0%	0%	0%	1.5%	0.4%	0%	0%	0.3%
Tc-R	0.7%	0%	0%	0%	0%	0%	0%	0%	0.1%
Dual-R (C+M)	26.2%	24.2%	25.7%	22.2%	12.5%	11.9%	15.8%	14%	18.8%
Triple-R (C+M+L)	13.8%	14.5%	16.1%	14.2%	6.2%	6.4%	7.0%	3.3%	10.3%

A, amoxicillin; B, bismuth salt; C, clarithromycin; L, levofloxacin; M, metronidazole; R, resistant; Tc, tetracycline.

P02.11

VONOPRAZAN-BASED DUAL THERAPY AND HIGH-DOSE PPI DUAL REGIMENS FOR *H. PYLORI* ERADICATION: A COMPARISON OF THE AVAILABLE DATA

L. GATTA[1], *P. MALFERTHEINER*[2,3], *C. SCARPIGNATO*[4,5]
[1]Versilia Hospital, Gastroenterology Unit, Lido di Camaiore, Italy, [2]Ludwig Maximilian Universität, Med Klinik II, München, Germany, [3]Otto v Guericke Universität, Magdeburg, Germany, [4]Department of Health Sciences, United Campus of Malta, Misda, Malta, [5]Faculty of Medicine, Chinese University of Hong Kong, ShaTin, Hong Kong.

Introduction: over the past decades, several attempts to develop a simple and effective, PPI-amoxicillin dual therapy for *H. pylori* eradication have been made, often with disappointing results. Since P-CAB achieve a fast, profound and long-lasting acid suppression, dual therapy with vonoprazan and amoxicillin (VDT) is a promising alternative first-line therapy for *H. pylori* eradication. Such treatment offers the option of being empirically-prescribed with no need of antibiotic resistance testing, thanks to the rare amoxicillin resistance.
Aims & Methods: to perform a systematic review and meta-analysis assessing the effectiveness of VDT to eradicate *H. pylori* infection. Databases were searched from inception to April 2021. Results were compared to those provided by available meta-analyses of high-dose PPI dual therapy (HDDT) trials.
Results: 4 adult trials, performed in Asia, were identified: in 2 studies VDT was given for 7 days, and in 2 studies for 14 days. The pooled eradication rates (ERs) (ITT and PP analysis) were 85.6% (95% CI: 74.8 to 94.0) and 89.1% (95%CI: 76.9 to 97.5), respectively. After removing an outlier study lasting 14 days, the ER became 92.3% and 100%. These ERs compare well with those of HDDT (Table).
Conclusions: VDT provides ER similar to those achieved with HDDT, but with simpler twice daily regimen. The preliminary results of PHALCON-HP study*, performed in Europe and USA, support these conclusions.

L. Gatta: None. P. Malfertheiner: None. C. Scarpignato: None.

*Phathom Press Release. https://investors.phathompharma.com/news-releases/news-release-details/phathom-pharmaceuticals-announces-positive-topline-results.

TABLE 1. SUMMARY OF META-ANALYSES OF RANDOMIZED CONTROLLED TRIALS ASSESSING THE EFFICACY OF HIGH-DOSE PPI DUAL THERAPY (HDDT).

Authors	Year	N	Eradication Rates, % - ITT	Eradication Rate, % - PP	Compliance %	Adverse Events, %
Gao et al.	2016	4	81.3	85.3	95.3	17.9
Yang et al.	2019	4	85.5	88.4	96.7	14.4
Gao et al.	2020	12	83.2	87.5	94.3	12.9
Zhu et al	2020	15	84.3	NR	NR	17.2

N, number of the studies included in the meta-analyses; ITT, intention to treat; PP, per protocol; NR, not reported.

P02.12

FIRST-LINE EMPIRICAL *H. PYLORI* ERADICATION THERAPY IN EUROPE: RESULTS FROM 30,000 CASES OF THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

O. P. NYSSEN[1], *Á. PÉREZ-AÍSA*[2], *D. VAIRA*[3], *L. JONAITIS*[4], *B. TEPES*[5], *A. KECO-HUERGA*[6], *M. CASTRO-FERNÁNDEZ*[6], *A. LUCENDO*[7], *D. BORDIN*[8], *N. BRGLEZ JURECIC*[9], *L. VOLOGZHANINA*[10], *M. CALDAS*[1], *G. FADIEIENKO*[11], *R. ABDULKHAKOV*[12], *L. BUJANDA*[13], *M. LEJA*[14], *M. ROMANO*[15], *S. GEORGOPOULOS*[16], *A. TONKIC*[17], *H. SIMSEK*[18], *A. GASBARRINI*[19], *G. M BUZAS*[20], *P. PHULL*[21], *M. VENERITO*[22], *P. MALFERTHEINER*[22], *J. KUPČINSKAS*[4], *G. BABAYEVA*[23], *O. SHVETS*[24], *F. LERANG*[25], *R. MARCOS PINTO*[26], *T. ROKKAS*[27], *I. SIMSEK*[28], *S. SMITH*[29], *Y. NIV*[30], *D. LAMARQUE*[31], *F. HELUWAERT*[32], *A. GOLDIS*[33], *W. MARLICZ*[34], *V. MILIVOJEVIC*[35], *L. BOYANOVA*[36], *L. KUNOVSKÝ*[37], *V. LAMY*[38], *C. BEGLINGER*[39], *P. BYTZER*[40], *L. CAPELLE*[41], *I. PUIG*[42], *F. MÉGRAUD*[43], *C. O'MORAIN*[29], *J. P. GISBERT*[1], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*
[1]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [2]Agencia Sanitaria Costa del Sol, Red de Investigación en Servicios de Salud en Enfermedades Crónicas (REDISSEC), Marbella, Spain, [3]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [4]Lithuanian University of Health Sciences, Kaunas, Lithuania, [5]AM DC Rogaska, Rogaska Slatina, Slovenia, [6]Hospital de Valme, Sevilla, Spain, [7]Hospital General de

Tomelloso, Tomelloso, Spain, [8]A.S. Loginov Moscow Clinical Scientific Center, Moscow, Russian Federation, [9]Interni oddelek, Diagnostic Centre, Bled, Slovenia, [10]Gastrocentr, Perm, Russian Federation, [11]Digestive Ukrainian Academy of Medical Sciences, Kyiv, Ukraine, [12]Kazan State Medical University, Kazan, Russian Federation, [13]Hospital Donostia/Instituto Biodonostia, Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Universidad del País Vasco (UPV/EHU), San Sebastián, Spain, [14]Digestive Diseases Centre GASTRO, Institute of Clinical and Preventive Medicine & Faculty of Medicine, University of Latvia, Riga, Spain, [15]Università degli Studi della Campania "Luigi Vanvitelli", Napoli, Italy, [16]Athens Medical Paleo Faliron Hospital, Athens, Greece, [17]University Hospital of Split, School of Medicine, University of Split, Croatia, [18]Internal Medicine, Hacettepe, University School of Medicine, Ankara, Turkey, [19]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy, [20]Ferencváros Health Centre, Budapest, Hungary, [21]Aberdeen Royal, Infirmary, United Kingdom, [22]Otto-von-Guericke University, Magdeburg, Germany, [23]Department of Therapy, Azerbaijan State Advanced Training Institute for Doctors named after A.ALIYEV, Baku, Azerbaijan, [24]Internal Medicine, National Medical University named after O.O.Bogomolets, Kyiv, Ukraine, [25]Østfold Hospital Trust, Grålum, Norway, [26]Centro Hospitalar do Porto Institute of Biomedical Sciences Abel Salazar, University of Porto, CINTESIS, University of Porto, Portugal, [27]Henry Dunant Hospital, Athens, Greece, [28]Dokuz Eylul University School of Medicine, Izmir, Turkey, [29]Trinity College Dublin, Dublin, Ireland, [30]Rabin Medical Center, Tel Aviv University, Petah Tikva, Israel, [31]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [32]Centre Hospitalier Annecy Genevois, Pringy, France, [33]Timisoara Hospital, Timisoara, Romania, [34]Pomeranian Medical University, Szczecin, Poland, [35]Clinical Center of Serbia and School of Medicine, University of Belgrade, Belgrade, Serbia, [36]Medical Microbiology, Medical University of Sofia, Sofia, Bulgaria, [37]Department of Gastroenterology and Internal Medicine and Department of Surgery, University Hospital Brno, Faculty of Medicine, Masaryk University, Brno, Czech Republic, [38]CHU de Charleroi, Charleroi, Belgium, [39]University Hospital Basel, Basel, Switzerland, [40]Clinical Medicine, Zealand University Hospital, Copenhagen University, Copenhagen, Denmark, [41]Meander Medical Center, Amersfoort, Netherlands, [42]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [43]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France.

Background: The best approach for *Helicobacter pylori* management remains unclear. An audit process is essential to ensure clinical practice is aligned with best standards of care.
Design: International multicentre prospective non-interventional registry starting in 2013 aimed to evaluate the decisions and outcomes in *H. pylori* management by European gastroenterologists. Patients were registered in an e-CRF by AEG-REDCap up to February 2021. *Variables included*: demographics, previous eradication attempts, prescribed treatment, adverse events, and outcomes. Modified intention-to-treat (mITT) and per-protocol (PP) analyses were performed and data were subject to quality review to ensure information reliability.
Results: In total 41,562 patients from 31 European countries were evaluated and 29,634 (70%) first-line empirical *H. pylori* treatments were included for analysis. Triple therapy with amoxicillin and clarithromycin was most commonly prescribed (39%), followed by non-bismuth concomitant treatment (18%) and bismuth quadruple (three-in-one single capsule) (12%), achieving 84%, 90% and 94% mITT eradication rate, respectively. Over 90% effectiveness was obtained only with 10 and 14-day bismuth quadruple or with 14-day concomitant treatment (Table). Longer treatment duration, higher acid inhibition and compliance were associated with higher eradication rates.
Conclusions: Management of *H. pylori* infection by European gastroenterologists is heterogeneous. Only quadruple therapies lasting at least ten days are able to achieve approximately 90% eradication rates.

O. P. Nyssen: None. Á. Pérez-Aísa: None. D. Vaira: None. L. Jonaitis: None. B. Tepes: None. A. Keco-Huerga: None. M. Castro-Fernández: None. A. Lucendo: None. D. Bordin: None. N. Brglez Jurecic: None. L. Vologzhanina: None. M. Caldas: None. G. Fadieienko: None. R. Abdulkhakov: None. L. Bujanda: None. M. Leja: None. M. Romano: None. S. Georgopoulos: None. A. Tonkic: None. H. Simsek: None. A. Gasbarrini: None. G. M Buzas: None. P. Phull: None. M. Venerito: None. P. Malfertheiner: None. J. Kupčinskas: None. G. Babayeva: None. O. Shvets: None. F. Lerang: None. R. Marcos Pinto: None. T. Rokkas: None. I. Simsek: None. S. Smith: None. Y. Niv: None. D. Lamarque: None. F. Heluwaert: None. A. Goldis: None. W.

Marlicz: None. V. Milivojevic: None. L. Boyanova: None. L. Kunovský: None. V. Lamy: None. C. Beglinger: None. P. Bytzer: None. L. Capelle: None. I. Puig: None. F. Mégraud: None. C. O'Morain: None. J. P. Gisbert: None.

TABLE 1. EFFECTIVENESS BY MODIFIED INTENTION-TO-TREAT (MITT) AND PER-PROTOCOL (PP) ANALYSES OF FIRST-LINE EMPIRICAL TREATMENTS IN EUROPE.

First-line treatment	Length (days)	mITT, N (%)	(95% CI)	PP, N (%)	(95% CI)
Triple-C+A	7	2,129 (82)	(81-84)	2,111 (83)	(81-85)
	10	3,346 (83)	(82-85)	3,304 (84)	(82-85)
	14	3,032 (87)	(86-88)	3,005 (87)	(87-89)
Triple-A+M	7	127 (80)	(72-87)	126 (79)	(72-87)
	10	173 (86)	(80-91)	171 (85)	(80-91)
	14	70 (88)	(80-97)	70 (88)	(80-97)
Triple-C+M	7	744 (84)	(82-87)	741 (85)	(73-85)
	10	122 (66)	(58-75)	120 (67)	(59-76)
	14	212 (87)	(83-92)	210 (87)	(82-92)
Triple-A+L	7	182 (79)	(73-85)	180 (79)	(72-85)
	10	150 (85)	(79-91)	144 (86)	(80-92)
Sequential-C+A+M/T	10	655 (82)	(79-85)	615 (84)	(81-87)
Concomitant-C+A+M/T	10	2,463 (88)	(87-90)	2,397 (89)	(88-90)
	14	2,687 (92)	(91-93)	2,629 (92)	(91-93)
Quadruple-C+A+B	10	644 (86)	(83-89)	637 (87)	(84-90)
	14	2,031 (92)	(91-93)	2,005 (92)	(91-93)
Quadruple-M+Tc+B	10	151 (91)	(87-96)	149 (92)	(87-97)
	14	85 (98)	(92-100)	88 (94)	(87-98)
Single capsule (M+Tc+B)	10	3,104 (94)	(93-95)	3,038 (95)	(94-96)

A – amoxicillin, C – clarithromycin; M – metronidazole; T – tinidazole; L – levofloxacin B; – bismuth salts; Tc – tetracycline.

P02.13

EMPIRICAL FIRST-LINE TREATMENT USE AND EFFECTIVENESS TRENDS IN EUROPE IN THE PERIOD 2013-2020: RESULTS FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

O. P. NYSSEN[1], *Á. PÉREZ-AÍSA*[2], *D. VAIRA*[3], *L. JONAITIS*[4], *B. TEPES*[5], *A. KECO-HUERGA*[6], *M. CASTRO-FERNÁNDEZ*[6], *A. LUCENDO*[7], *D. BORDIN*[8], *N. BRGLEZ JURECIC*[9], *L. VOLOGZHANINA*[10], *M. CALDAS*[1], *G. FADIEIENKO*[11], *R. ABDULKHAKOV*[12], *L. BUJANDA*[13], *M. LEJA*[14], *M. ROMANO*[15], *S. GEORGOPOULOS*[16], *A. TONKIC*[17], *H. SIMSEK*[18], *A. GASBARRINI*[19], *G. M BUZAS*[20], *P. PHULL*[21], *M. VENERITO*[22], *P. MALFERTHEINER*[22], *J. KUPČINSKAS*[4], *G. BABAYEVA*[23], *O. SHVETS*[24], *F. LERANG*[25], *R. MARCOS PINTO*[26], *T. ROKKAS*[27], *I. SIMSEK*[28], *S. SMITH*[29], *Y. NIV*[30], *D. LAMARQUE*[31], *F. HELUWAERT*[32], *A. GOLDIS*[33], *W. MARLICZ*[34], *V. MILIVOJEVIC*[35], *L. BOYANOVA*[36], *L. KUNOVSKÝ*[37], *V. LAMY*[38], *C. BEGLINGER*[39], *P. BYTZER*[40], *L. CAPELLE*[41], *I. PUIG*[42], *F. MÉGRAUD*[43], *C. O'MORAIN*[29], *J. P. GISBERT*[1], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*

[1]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [2]Agencia Sanitaria Costa del Sol, Red de Investigación en Servicios de Salud en Enfermedades Crónicas (REDISSEC), Marbella, Spain, [3]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [4]Lithuanian University of Health Sciences, Kaunas, Lithuania, [5]AM DC Rogaska, Rogaska Slatina, Slovenia, [6]Hospital de Valme, Sevilla, Spain, [7]Hospital General de Tomelloso, Tomelloso, Spain, [8]A.S. Loginov Moscow Clinical Scientific Center, Moscow, Russian Federation, [9]Interni oddelek, Diagnostic Centre, Bled, Spain, [10]Gastrocentr, Perm, Russian Federation, [11]Digestive Ukrainian Academy of Medical Sciences, Kyiv, Ukraine, [12]Kazan State Medical University, Ka-

zan, Russian Federation, [13]Hospital Donostia/Instituto Biodonostia, Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Universidad del País Vasco (UPV/EHU), San Sebastián, Spain, [14]Digestive Diseases Centre GASTRO, Institute of Clinical and Preventive Medicine & Faculty of Medicine, University of Latvia, Riga, Spain, [15]Università degli Studi della Campania "Luigi Vanvitelli", Napoli, Italy, [16]Athens Medical Paleo Faliron Hospital, Athens, Greece, [17]University Hospital of Split, School of Medicine, University of Split, Croatia, [18]Internal Medicine, Hacettepe, University School of Medicine, Ankara, Turkey, [19]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy, [20]Ferencváros Health Centre, Budapest, Hungary, [21]Aberdeen Royal, Infirmary, United Kingdom, [22]Otto-von-Guericke University, Magdeburg, Germany, [23]Department of Therapy, Azerbaijan State Advanced Training Institute for Doctors named after A.ALIYEV, Baku, Azerbaijan, [24]Internal Medicine, National Medical University named after O.O.Bogomolets, Kyiv, Ukraine, [25]Østfold Hospital Trust, Grålum, Norway, [26]Centro Hospitalar do Porto Institute of Biomedical Sciences Abel Salazar, University of Porto, CINTESIS, University of Porto, Portugal, [27]Henry Dunant Hospital, Athens, Greece, [28]Dokuz Eylul University School of Medicine, Izmir, Turkey, [29]Trinity College Dublin, Dublin, Ireland, [30]Rabin Medical Center, Tel Aviv University, Petah Tikva, Israel, [31]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [32]Centre Hospitalier Annecy Genevois, Pringy, France, [33]Timisoara Hospital, Timisoara, Romania, [34]Pomeranian Medical University, Szczecin, Poland, [35]Clinical Center of Serbia and School of Medicine, University of Belgrade, Belgrade, Serbia, [36]Medical Microbiology, Medical University of Sofia, Sofia, Bulgaria, [37]Department of Gastroenterology and Internal Medicine and Department of Surgery, University Hospital Brno, Faculty of Medicine, Masaryk University, Brno, Czech Republic, [38]CHU de Charleroi, Charleroi, Belgium, [39]University Hospital Basel, Basel, Switzerland, [40]Clinical Medicine, Zealand University Hospital, Copenhagen University, Copenhagen, Denmark, [41]Meander Medical Center, Amersfoort, Netherlands, [42]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [43]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France.

Background: The impact of consensus, prescription choices and efficacy trends on clinical practice over time has not been studied in depth.
Methods: International multicenter prospective non-interventional registry aimed to evaluate the decisions and outcomes of *H. pylori* management by European gastroenterologists. All infected adult patients were registered at AEG-REDCap e-CRF up to February 2021. Modified intention-to-treat (mITT) and time trend analyses were performed.
Results: So far 29,634 first-line empirical prescriptions from 31 European countries have been included. Overall, the most common prescribed treatments in the 2013-20 were triple therapies; however, a shift in antibiotic regimens was identified. Triple therapies decreased from over 50% of prescription in 2013/15 to less than 20% in 2018/20. Non-bismuth concomitant therapy use decreased from 21% in 2013/14 to 13% in 2019/20, while Pylera® increased from 0-1% in 2014/2015 to 19% in 2019/20. An increase in the average duration of treatments from 11 to 13 days in 2013-2020, and of the daily dose of PPI, was identified (No trend was identified (data now shown); however, there was an 8% overall improvement in first-line mITT overall effectiveness from 2013 to 2020 (Table 1).
Conclusions: European gastroenterological practice is constantly adapting to the newest published evidence and recommendations (reducing the use of triple therapies and increasing the duration of treatment and the dose of PPIs), with a subsequent progressive improvement in overall effectiveness.

O. P. Nyssen: None. Á. Pérez-Aísa: None. D. Vaira: None. L. Jonaitis: None. B. Tepes: None. A. Keco-Huerga: None. M. Castro-Fernández: None. A. Lucendo: None. D. Bordin: None. N. Brglez Jurecic: None. L. Vologzhanina: None. M. Caldas: None. G. Fadieienko: None. R. Abdulkhakov: None. L. Bujanda: None. M. Leja: None. M. Romano: None. S. Georgopoulos: None. A. Tonkic: None. H. Simsek: None. A. Gasbarrini: None. G. M Buzas: None. P. Phull: None. M. Venerito: None. P. Malfertheiner: None. J. Kupčinskas: None. G. Babayeva: None. O. Shvets: None. F. Lerang: None. R. Marcos Pinto: None. T. Rokkas: None. I. Simsek: None. S. Smith: None. Y. Niv: None. D. Lamarque: None. F. Heluwaert: None. A. Goldis: None. W. Marlicz: None. V. Milivojevic: None. L. Boyanova: None. L. Kunovský: None. V. Lamy: None. C. Beglinger: None. P. Bytzer: None. L. Capelle: None. I. Puig: None. F. Mégraud: None. C. O'Morain: None. J. P. Gisbert: None.

TABLE 1. PRESCRIPTIONS AND EFFECTIVENESS TRENDS OF FIRST-LINE EMPIRICAL TREATMENTS IN EUROPE IN THE PERIOD 2013-2020.

Year	2013	2014	2015	2016	2017	2018	2019	2020
Quadruple-C+A+B	2.0%	2.7%	6.8%	20.5%	13.7%	21.7%	10.8%	9.8%
Pylera®*	0.1%	0.0%	0.5%	13.2%	24.5%	18.7%	21.7%	16.5%
Quadruple-M+Tc+B	2.1%	1.9%	0.5%	0.2%	0.4%	0.5%	1.4%	1.2%
Concomitant-C+A+M/T	21.8%	21.5%	27.0%	22.7%	20.9%	8.0%	13.4%	12.8%
Sequential-C+A+M/T	11.8%	3.5%	1.9%	0.9%	0.5%	0.7%	0.11%	0.1%
Triple-A+L	2.3%	2.2%	3.1%	1.8%	0.3%	0.3%	0.4%	0.3%
Triple-A+M	3.6%	3.0%	1.7%	0.8%	0.9%	0.5%	1.9%	0.7%
Triple-C+M	3.4%	6.4%	8.8%	6.3%	1.4%	0.7%	1.1%	10.2%
Triple-C+A	48.5%	54.6%	44.7%	29.2%	32.1%	31.0%	35.2%	34.6%
Length								
7 days	27.5%	28.1%	24.4%	16.2%	7.9%	1.7%	2.1%	4.5%
10 days	55.1%	52.6%	55.1%	46.5%	47.2%	41.6%	34.7%	29.4%
14 days	17.4%	19.3%	20.4%	37.3%	44.9%	56.7%	63.2%	66.1%
PPI acid inhibition**								
Low	66.6%	56.6%	47.3%	37.9%	39.7%	25.0%	30.1%	45.3%
Standard	16.9%	25.5%	26.7%	24.1%	23.7%	41.3%	30.9%	19.5%
High	16.5%	17.9%	26.0%	38.0%	36.6%	33.7%	39.0%	35.2%
Eradication rate (mITT)	85.0%	85.1%	85.7%	87.6%	87.7%	91.4%	91.5%	92.7%

PPI: proton pump inhibitor; mITT: modified intention-to-treat; A – amoxicillin, C – clarithromycin; M – metronidazole; T – tinidazole; L – levofloxacin B; – bismuth salts; Tc – tetracycline. *: three-in-one single capsule containing metronidazole, tetracycline and bismuth; **Low dose PPI – 4.5 to 27 mg omeprazole equivalents, b.i.d.; standard dose PPI – 32 to 40 mg omeprazole equivalents, b.i.d.; high dose PPI – 54 to 128 mg omeprazole equivalents, b.i.d.

P02.14

EMPIRICAL SECOND-LINE TREATMENTS IN EUROPE: RESULTS FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG

O. P. NYSSEN[1], *Á. PÉREZ-AÍSA*[2], *D. VAIRA*[3], *G. FIORINI*[3], *L. RODRIGO*[4], *A. KECO-HUERGA*[5], *M. CASTRO-FERNÁNDEZ*[5], *J. KUPČINSKAS*[6], *L. JONAITIS*[6], *B. TEPES*[7], *L. VOLOGZHANINA*[8], *M. CALDAS*[1], *S. MARTINEZ-DOMINGUEZ*[9], *E. ALFARO*[9], *A. LUCENDO*[10], *L. BUJANDA*[11], *T. DI MAIRA*[12], *J. BARRIO*[13], *J. M. HUGUET*[14], *J. PEREZ LASALA*[15], *D. BORDIN*[16], *M. LEJA*[17], *A. GASBARRINI*[18], *S. GEORGOPOULOS*[19], *F. LERANG*[20], *P. PHULL*[21], *T. ROKKAS*[22], *O. SHVETS*[23], *Y. NIV*[24], *D. LAMARQUE*[25], *F. HELUWAERT*[26], *A. TONKIĆ*[27], *M. VENERITO*[28], *I. SIMSEK*[29], *V. MILIVOJEVIC*[30], *G. M BUZAS*[31], *V. LAMY*[32], *W. MARLICZ*[33], *L. BOYANOVA*[34], *P. BYTZER*[35], *L. CAPELLE*[36], *L. KUNOVSKÝ*[37], *A. GOLDIS*[38], *C. BEGLINGER*[39], *M. ESPADA*[1], *I. PUIG*[40], *F. MÉGRAUD*[41], *C. O'MORAIN*[42], *J. P. GISBERT*[1], *ON BEHALF OF THE HP-EUREG INVESTIGATORS GASTROENTEROLOGY UNIT OF*

[1]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [2]Agencia Sanitaria Costa del Sol, Red de Investigación en Servicios de Salud en Enfermedades Crónicas (REDISSEC), Marbella, Spain, [3]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [4]Hospital de Asturias, Oviedo, Spain, [5]Hospital de Valme, Sevilla, Spain, [6]Lithuanian University of Health Sciences, Kaunas, Lithuania, [7]AM DC Rogaska,, Rogaska Slatina, Slovenia, [8]Gastrocentr, Perm, Russian Federation, [9]Hospital Clínico Universitario Lozano Blesa, Zaragoza, Spain, [10]Hospital General de Tomelloso, Tomelloso, Spain, [11]Hospital Donostia/Instituto Biodonostia, Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Universidad del País Vasco (UPV/EHU), San Sebastián, Spain, [12]Hospital Universitari i Politècnic, La Fe, Valencia, Spain, [13]Hospital Río Hortega, Valladolid, Spain, [14]Hospital General Univer-

sitario de Valencia, Valencia, Spain, [15]HM Sanchinarro, Madrid, Spain, [16]A.S. Loginov Moscow Clinical Scientific Center, Moscow, Russian Federation, [17]Digestive Diseases Centre GASTRO, Institute of Clinical and Preventive Medicine & Faculty of Medicine, University of Latvia, Riga, Latvia, [18]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy, [19]Athens Medical Paleo Faliron Hospital, Athens, Greece, [20]Østfold Hospital Trust, Grålum, Norway, [21]Aberdeen Royal, Infirmary, United Kingdom, [22]Henry Dunant Hospital, Athens, Greece, [23]Internal Medicine, National Medical University named after O.O.Bogomolets, Kyiv, Turks and Caicos Islands, [24]Rabin Medical Center, Tel Aviv University, Petah Tikva, Israel, [25]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [26]Centre Hospitalier Annecy Genevois, Pringy, France, [27]University Hospital of Split, School of Medicine, University of Split, Croatia, [28]Otto-von-Guericke University, Magdeburg, Germany, [29]Dokuz Eylul University School of Medicine, Izmir, Turkey, [30]Clinical Center of Serbia and School of Medicine, University of Belgrade, Belgrade, Serbia, [31]Ferencváros Health Centre, Budapest, Hungary, [32]CHU de Charleroi, Charleroi, Belgium, [33]Pomeranian Medical University, Szczecin, Poland, [34]Medical Microbiology, Medical University of Sofia, Sofia, Bulgaria, [35]Clinical Medicine, Zealand University Hospital, Copenhagen University, Copenaguen, Denmark, [36]Meander Medical Center, Amersfoort, Netherlands, [37]Department of Gastroenterology and Internal Medicine and Department of Surgery, University Hospital Brno, Faculty of Medicine, Masaryk University, Brno, Czech Republic, [38]Timisoara Hospital, Timisoara, Romania, [39]University Hospital Basel, Basel, Switzerland, [40]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [41]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [42]Trinity College Dublin, Dublin, Ireland.

Background: After a first eradication attempt, approximately 10-20% of patients will fail to achieve *H. pylori* eradication.
Aims: To evaluate the effectiveness of second-line empirical treatments.
Methods: A systematic prospective registry of the clinical practice of European gastroenterologists (31 countries) on *H. pylori* management was established. All infected adult patients were systematically registered at AEG-REDCap e-CRF until February 2021. Modified intention-to-treat (mITT) and per-protocol (PP) analyses were performed.
Results: Overall, 5,228 patients received a second-line empirical therapy. Overall effectiveness was 84% (both by mITT and PP). Over 97% of patients were compliant. AEs were reported in 28% of the cases. Most frequent second-line prescriptions and effectiveness per antibiotic combination is shown in table 1. After failure of first-line clarithromycin-containing treatment, optimal eradication (>90%) was obtained with moxifloxacin-containing triple therapy, or quadruple therapy with levofloxacin and bismuth. In patients receiving triple regimens containing levofloxacin or moxifloxacin and levofloxacin-bismuth quadruple regimens, cure rates were optimized with 14-day regimens using high doses of proton pump inhibitors (PPIs). However, Pylera® or quadruple therapy with levofloxacin and bismuth achieved consistent eradication rates regardless of the PPI dose, duration of therapy, or previous first-line treatment regimen.
Conclusion: Empirical second-line regimens including either 14-day triple therapies with levofloxacin or moxifloxacin, or 14-day levofloxacin-bismuth quadruple or 10-day bismuth quadruple therapies provided optimal effectiveness. However, many other second-line treatments evaluated reported low eradication rates.

O. P. Nyssen: None. Á. Pérez-Aísa: None. D. Vaira: None. G. Fiorini: None. L. Rodrigo: None. A. Keco-Huerga: None. M. Castro-Fernández: None. J. Kupčinskas: None. L. Jonaitis: None. B. Tepes: None. L. Vologzhanina: None. M. Caldas: None. S. Martinez-Dominguez: None. E. Alfaro: None. A. Lucendo: None. L. Bujanda: None. T. Di Maira: None. J. Barrio: None. J. M. Huguet: None. J. Perez Lasala: None. D. Bordin: None. M. Leja: None. A. Gasbarrini: None. S. Georgopoulos: None. F. Lerang: None. P. Phull: None. T. Rokkas: None. O. Shvets: None. Y. Niv: None. D. Lamarque: None. F. Heluwaert: None. A. Tonkić: None. M. Venerito: None. I. Simsek: None. V. Milivojevic: None. G. M Buzas: None. V. Lamy: None. W. Marlicz: None. L. Boyanova: None. P. Bytzer: None. L. Capelle: None. L. Kunovský: None. A. Goldis: None. C. Beglinger: None. M. Espada: None. I. Puig: None. F. Mégraud: None. C. O'Morain: None. J. P. Gisbert: None.

TABLE 1. FREQUENCY OF SECOND-LINE EMPIRICAL TREATMENT PRESCRIPTIONS AND EFFECTIVENESS BY MODIFIED INTENTION-TO-TREAT (MITT) AND PER-PROTOCOL (PP) ANALYSES.

Treatment	N	% Use	mITT, N (%)	(95% CI)	PP, N (%)	(95% CI)
Triple-A+L	1,624	32.1	1,434 (81)	(79-83)	1,413 (81)	(79-83)
Single capsule*	889	17.6	810 (89)	(87-92)	794 (90)	(88-92)
Quadruple-A+L+B	647	12.8	559 (88)	(86-91)	542 (89)	(86-91)
Triple-C+A	346	6.8	246 (78)	(73-84)	241 (78)	(73-84)
Quadruple-M+Tc+B	264	5.2	232 (84)	(79-89)	223 (85)	(80-90)
Quadruple C+A+B	257	5.1	154 (87)	(81-93)	148 (87)	(81-93)
Quadruple-C+A+M	221	4.4	207 (82)	(76-87)	202 (82)	(77-88)
Triple-A+Mx	143	2.8	135 (91)	(86-96)	135 (91)	(86-96)
Triple-A+M	103	2.0	48 (58)	(47-69)	86 (58)	(47-79)
Other	562	11.1	NA	NA	NA	NA
Total	5,056	100%	4,326 (84)	(82-85)	4,236 (84)	(80-83)

95%CI – 95% confidence interval, C – clarithromycin, M – metronidazole, T – tinidazole, A – amoxicillin, L – levofloxacin, B – bismuth salts, Tc – tetracycline, Mx – moxifloxacin, N – Total number of patients receiving an empirical treatment, Other – Other second-line empirical treatments with less than 100 patients treated in each category; *three-in-one single capsule containing metronidazole tetracycline and bismuth.

P02.15

EXPERIENCE WITH SINGLE CAPSULE BISMUTH QUADRUPLE THERAPY IN 5,000 PATIENTS FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

O. P. NYSSEN[1], *Á. PÉREZ-AÍSA*[2], *A. KECO-HUERGA*[3], *M. CASTRO-FERNÁNDEZ*[3], *A. LUCENDO*[4], *D. VAIRA*[5], *L. RODRIGO*[6], *R. PELLICANO*[7], *A. GASBARRINI*[8], *B. GOMEZ RODRIGUEZ*[9], *T. DI MAIRA*[10], *J. ORTUÑO*[10], *M. PERONA*[11], *A. G. GRAVINA*[12], *M. ROMANO*[12], *J. M. HUGUET*[13], *L. FERRER*[13], *Ó. NUÑEZ*[14], *J. BARRIO*[15], *L. FERNANDEZ-SALAZAR*[16], *E. IYO*[17], *M. AREIA*[18], *J. MOLINA-INFANTE*[19], *M. VENERITO*[20], *P. MALFERTHEINER*[20], *R. ROSANIA*[20], *A. LANAS*[21], *S. MARTINEZ-DOMINGUEZ*[21], *E. ALFARO*[21], *B. GÓMEZ*[22], *M. FERNÁNDEZ-BERMEJO*[23], *P. DELGADO GUILLENA*[24], *M. CALDAS*[1], *R. MARCOS PINTO*[25], *B. TEPES*[26], *D. LAMARQUE*[27], *F. HELUWAERT*[28], *W. MARLICZ*[29], *L. KUNOVSKÝ*[30], *V. MILIVOJEVIC*[31], *D. BORDIN*[32], *T. ROKKAS*[33], *M. LEJA*[34], *J. KUPČINSKAS*[35], *M. ESPADA*[1], *I. PUIG*[36], *F. MÉGRAUD*[37], *C. O'MORAIN*[38], *J. P. GISBERT*[1], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*

[1]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [2]Agencia Sanitaria Costa del Sol, Red de Investigación en Servicios de Salud en Enfermedades Crónicas (REDISSEC), Marbella, Spain, [3]Hospital de Valme, Sevilla, Spain, [4]Hospital General de Tomelloso, Tomelloso, Spain, [5]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [6]Hospital de Asturias, Oviedo, Spain, [7]Outpatient clinic, Molinette-SGAS Hospital, University of Turin, Italy, [8]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy, [9]Hospital Virgen de la Macarena, Seville, Spain, [10]Hospital Universitari i Politècnic La Fe, Valencia, Spain, [11]Hospital Quirón, Marbella, Spain, [12]Università degli Studi della Campania "Luigi Vanvitelli", Napoli, Italy, [13]Hospital General Universitario de Valencia, Valencia, Spain, [14]Hospital Univ. La Moraleja, Madrid, Spain, [15]Hospital Río Hortega, Valladolid, Spain, [16]Hospital Clínico Universitario, Valladolid, Spain, [17]Hospital Comarcal de Inca, Mallorca, Spain, [18]Portuguese Oncology Institute, Coimbra, Portugal, [19]Hospital San Pedro de Alcantara, Cáceres, Spain, [20]Otto-von-Guericke University, Magdeburg, Germany, [21]Hospital Clínico Universitario Lozano Blesa, Zaragoza, Spain, [22]Hospital de Mataró, Barcelona, Spain, [23]Clínica San Francisco, Cáceres, Spain, [24]Hospital de Mérida, Badajoz, Spain, [25]Centro Hospitalar do Porto Institute of Biomedical Sciences Abel Salazar, University of Porto, CINTESIS, University of Porto, Portugal, [26]AM DC Rogaska, Rogaska Slatina, Slovenia, [27]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [28]Centre Hospitalier Annecy Genevois, Pringy, France, [29]Pomeranian Medical Uni-

versity, Szczecin, Poland, [30]Department of Gastroenterology and Internal Medicine and Department of Surgery, University Hospital Brno, Faculty of Medicine, Masaryk University, Brno, Czech Republic, [31]Clinical Center of Serbia and School of Medicine, University of Belgrade, Belgrade, Serbia, [32]A.S. Loginov Moscow Clinical Scientific Center, Moscow, Russian Federation, [33]Henry Dunant Hospital, Athens, Greece, [34]Digestive Diseases Centre GASTRO, Institute of Clinical and Preventive Medicine & Faculty of Medicine, University of Latvia, Riga, Latvia, [35]Lithuanian University of Health Sciences, Kaunas, Lithuania, [36]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [37]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [38]Trinity College Dublin, Dublin, Ireland.

Background: There has been resurgence in the use of bismuth-quadruple therapy (PPI, bismuth, tetracycline and metronidazole) in Europe with the commercialization of a three-in-one single-capsule formulation, but the evidence is still limited.
Aim: To evaluate the effectiveness and safety of the single capsule.
Methods: Systematic prospective registry of the clinical practice of gastroenterologists in the European Registry on *Helicobacter pylori* management (Hp-EuReg) collecting all infected adult patients treated with 10-day single capsule according to data sheet (3 capsules/6h) or alternative three times a day (4 capsules/8h) prescriptions, at AEG-REDCap e-CRF until February 2021. Modified intention-to-treat (mITT) and per-protocol (PP) analyses were performed and data were subject to quality review.
Results: Overall, 5,068 (12%) received single-capsule bismuth-quadruple therapy achieving a high eradication rate based on the mITT (92%) and PP (93%) analyses, especially in first-line treatment (94%) but it had also high effectiveness as a rescue therapy, both in second-line (90%) or subsequent lines of therapy (3rd-6th lines:86%) (Table 1). Compliance was the factor most closely associated effectiveness. Adverse events were generally mild-to-moderate and transient, only 3% of patients reported a severe adverse event, leading to discontinuation of treatment in 1.7% of patients.
Conclusions: Treatment with10-day single-capsule bismuth-quadruple therapy achieves *H. pylori* eradication in approximately 90% of patients by mITT in real-world clinical practice, both as a first-line and rescue treatment, with a favourable safety profile.

O. P. Nyssen: None. Á. Pérez-Aísa: None. A. Keco-Huerga: None. M. Castro-Fernández: None. A. Lucendo: None. D. Vaira: None. L. Rodrigo: None. R. Pellicano: None. A. Gasbarrini: None. B. Gomez Rodriguez: None. T. Di Maira: None. J. Ortuño: None. M. Perona: None. A. G. Gravina: None. M. Romano: None. J. M. Huguet: None. L. Ferrer: None. Ó. Nuñez: None. J. Barrio: None. L. Fernandez-Salazar: None. E. Iyo: None. M. Areia: None. J. Molina-Infante: None. M. Venerito: None. P. Malfertheiner: None. R. Rosania: None. A. Lanas: None. S. Martinez-Dominguez: None. E. Alfaro: None. B. Gómez: None. M. Fernández-Bermejo: None. P. Delgado Guillena: None. M. Caldas: None. R. Marcos Pinto: None. B. Tepes: None. D. Lamarque: None. F. Heluwaert: None. W. Marlicz: None. L. Kunovský: None. V. Milivojevic: None. D. Bordin: None. T. Rokkas: None. M. Leja: None. J. Kupčinskas: None. M. Espada: None. I. Puig: None. F. Mégraud: None. C. O'Morain: None. J. P. Gisbert: None.

TABLE 1. THREE-IN-ONE SINGLE CAPSULE EFFECTIVENESS IN FIRST-LINE AND CONSECUTIVE RESCUE TREATMENT LINES.

	Use, N (%)	mITT, N (%)	95% CI	PP, N (%)	95% CI
Overall	5,068 (12*)	4,687 (92)	(91-93)	4,586 (93)	(92-94)
1st line (naïve)	3,538 (70)	3,286 (94)	(93-95)	3,218 (95)	(94-95)
2nd line	948 (19)	865 (90)	(88-92)	848 (90)	(88-92)
3rd line	437 (9)	403 (89)	(86-92)	392 (89.5)	(86-93)
Rescue (3rd to 6th line)	582 (11.5)	536 (86)	(82-89)	520 (87)	(84-90)

*Of the total of treatments included in the Hp-EuReg up to February 2021 (i.e., N= 41,562); mITT: modified intention-to-treat; PP: per-protocol, N: total number of patients analysed.

P02.16

BISMUTH QUADRUPLE THREE-IN-ONE SINGLE CAPSULE: 3 OR 4 TIMES DAILY? SUB-ANALYSIS OF THE SPANISH DATA OF THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

Á. PÉREZ-AÍSA*[1], *O. P. NYSSEN**[2], *A. LUCENDO*[3], *J. BARRIO*[4], *B. J. GOMEZ RODRIGUEZ*[5], *T. DI MAIRA*[6], *J. ORTUÑO*[6], *B. GÓMEZ*[7], *M. PERONA*[8], *L. FERNÁNDEZ-SALAZAR*[9], *E. IYO*[10], *A. CAMPILLO*[11], *L. MOREIRA*[12], *M. JIMENEZ MORENO*[13], *A. KECO-HUERGA*[14], *M. CASTRO-FERNÁNDEZ*[14], *Ó. NUÑEZ*[15], *R. PAJARES VILLARROYA*[16], *M. ESPADA*[2], *A. CANO*[17], *I. PUIG*[17], *F. MÉGRAUD*[18], *C. O'MORAIN*[19], *X. CALVET***[20], *J. P. GISBERT***[2], **BOTH FIRST AUTHORS AND **BOTH SENIOR AUTHORS CONTRIBUTED EQUALLY TO THE STUDY, ON BEHALF OF THE HP-EUREG INVESTIGATORS;*

[1]Agencia Sanitaria Costa del Sol, Red de Investigación en Servicios de Salud en Enfermedades Crónicas (REDISSEC), Marbella, Spain, [2]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [3]Hospital General de Tomelloso, Tomelloso, Spain, [4]Hospital Río Hortega, Valladolid, Spain, [5]Hospital Virgen de la Macarena, Seville, Spain, [6]Hospital Universitari i Politècnic La Fe, Valencia, Spain, [7]Hospital de Mataró, Barcelona, Spain, [8]Hospital Quirón, Marbella, Spain, [9]Hospital Clínico Universitario, Valladolid, Spain, [10]Hospital Comarcal de Inca, Mallorca, Spain, [11]Hospital Reina Sofía, Tudela, Spain, [12]Hospital Clinic de Barcelona, Barcelona, Spain, [13]Hospital Universitario de Burgos, Burgos, Spain, [14]Hospital de Valme, Sevilla, Spain, [15]Department of Clinical Medicine Hospital Uni. Sanitas La Moraleja, Madrid, Spain, [16]Hospital Infanta Sofia, Madrid, Spain, [17]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [18]Laboratoire de Bactétiologie, Hôpital Pellegrin, Bordeaux, France, [19]Trinity College Dublin, Dublin, Ireland, [20]Hospital de Sabadell, CIBERehd, Spain.

Background: Bismuth quadruple with the single capsule (PPI, bismuth, tetracycline and metronidazole) includes the intake of 3 capsules four times a day (3c/6h), according to the technical sheet. This scheme may not be suitable for Spanish eating habits; therefore, some physicians prescribe 4 capsules three times a day (4c/8h).

Aim: To assess the effectiveness and safety of quadruple single capsule bismuth therapy administered three times a day (4c/8h).

Methods: Systematic prospective registry of the clinical practice of gastroenterologists in the European Registry on *Helicobacter pylori* management (Hp-EuReg) collecting all infected Spanish cases treated with the single capsule at AEG-REDCap e-CRF until February 2021. Effectiveness was provided for both the modified intention-to-treat and per-protocol sets.

Results: Overall, 3,624 (71%) cases were from Spain. Of those, 2,459 (68%) were treated with 3c/6h and 1,165 (32%) with the 4c/8h scheme. Most of the cases (72%) were naïve to treatment. Both treatment schedules showed equivalent compliance, adverse events, and eradication rates (table 1). In the group 3c/6h, 4 patients suffered a serious adverse event requiring hospitalisation.

Conclusions: The prescription of quadruple therapy with three-in-one single capsule bismuth given as four capsules three times a day seems to have the same compliance, tolerance and effectiveness as the scheme included in the data sheet (three capsules four times a day) with the benefit of being more convenient for the patient.

Á. Pérez-Aísa: None. O. P. Nyssen*: None. A. Lucendo: None. J. Barrio: None. B. J. Gomez Rodriguez: None. T. Di Maira: None. J. Ortuño: None. B. Gómez: None. M. Perona: None. L. Fernández-Salazar: None. E. Iyo: None. A. Campillo: None. L. Moreira: None. M. Jimenez Moreno: None. A. Keco-Huerga: None. M. Castro-Fernández: None. Ó. Nuñez: None. R. Pajares Villarroya: None. M. Espada: None. A. Cano: None. I. Puig: None. F. Mégraud: None. C. O'Morain: None. X. Calvet**: None. J. P. Gisbert**: None.*

TABLE 1. EFFECTIVENESS (BY MODIFIED INTENTION-TO-TREAT AND PER-PROTOCOL ANALYSES), COMPLIANCE AND SAFETY OF TREATMENT WITH THREE-IN-ONE SINGLE CAPSULE IN FIRST-, SECOND-, AND THIRD-LINE.

				Modified intention-to-treat				Per protocol			
N	Compliance		AEs	Overall	1st line	2nd line	3rd line	Overall	1st line	2nd line	3rd line
4c/8h	1,165	97%	28%	94%	96%	89%	89%	95%	96%	89%	89%
3c/6h	2,405	97%	26%	91%	93%	88%	88%	92%	93%	89%	89%

N: number of treatments. AEs: adverse events. 4c/8h: four capsules three times a day; 3c/6h: three capsules four times a day.

P02.17

ANTIBIOTIC RESISTANCE TRENDS OF *HELICOBACTER PYLORI* NAÏVE PATIENTS IN THE PERIOD 2013-2020: ANALYSIS OF THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

L. BUJANDA[1], *O. P. NYSSEN*[2], *D. VAIRA*[3], *G. FIORINI*[3], *I. MARIA SARACINO*[3], *F. LERANG*[4], *S. GEORGOPOULOS*[5], *B. TEPES*[6], *F. HELUWAERT*[7], *A. GASBARRINI*[8], *T. ROKKAS*[9], *D. BORDIN*[10], *S. SMITH*[11], *D. LAMARQUE*[12], *F. HELUWAERT*[13], *V. LAMY*[14], *R. MUÑOZ*[2], *M. ESPADA*[2], *E. RESINA*[2], *A. CANO*[15], *I. PUIG*[15], *F. MÉGRAUD*[16], *C. O'MORAIN*[11], *J. P. GISBERT*[2], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*

[1]Hospital Donostia/Instituto Biodonostia, Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Universidad del País Vasco (UPV/EHU), San Sebastián, Spain, [2]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [3]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [4]Østfold Hospital Trust, Grålum, Norway, [5]Athens Medical Paleo Faliron Hospital, Athens, Greece, [6]AM DC Rogaska, Rogaska Slatina, Slovenia, [7]Centre Hospitalier Annecy Genvois, Pringy, France, [8]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy, [9]Henry Dunant Hospital, Athens, Greece, [10]A.S. Loginov Moscow Clinical Scientific Center, Moscow, Russian Federation, [11]Trinity College Dublin, Dublin, Ireland, [12]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [13]Centre Hospitalier Annecy Genevois, Pringy, France, [14]CHU de Charleroi, Charleroi, Belgium, [15]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [16]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France.

Background: Bacterial antibiotic resistance frequently changes over time. It is essential to study these trends to apply preventive strategies to help reducing such resistances.
Objective: To conduct a time-trend analysis of the antibiotic resistance to *H. pylori* infection in Europe.
Methods: International prospective European Registry on *H. pylori* Management (Hp-EuReg) collecting all infected adult patients diagnosed with culture and with a result of the antibiotic resistance test were registered at AEG-REDCap e-CRF until February 2021.
Results: A total of 41,562 patients were included, and culture was performed in 3,974 (10%), where 2,852 naïve patients were included for analysis. Resistance to at least one antibiotic was described in 27% of the patients. Resistance to metronidazole (30%) was most frequent, whereas resistance to tetracycline and amoxicillin was below 1%. Clarithromycin resistance remained above 15% throughout the studied years (Table 1). A significant decrease in the metronidazole resistance rate was observed between 2013 (39%) and 2020 (18%), $p<0.001$. Likewise, a decrease in the levofloxacin resistance rate (from 14% to 7%, $p<0.001$) or in dual (clarithromycin and metronidazole) resistance rate (from 13% to 7%, $p<0.05$) were observed in the same period.

TABLE 1. ANTIBIOTIC RESISTANCE TRENDS (2013-2020) OF H. PYLORI NAÏVE PATIENTS IN EUROPE.

N (%)	2013	2014	2015	2016	2017	2018	2019	2020	Variation range
Nº Cultures	423	521	501	271	343	282	270	218	270-521
No resistance	209 (49)	260 (50)	245 (49)	120 (44)	188 (55)	135 (48)	130 (48)	78 (36)	36-55
Clarithromycin (C)	85 (20)	119 (23)	136 (27)	91 (34)	83 (24)	76 (27)	76 (28)	35 (16)	16-34
Metronidazole (M)	165 (39)	155 (30)	162 (32)	90 (33)	84 (25)	78 (28)	77 (29)	40 (18)	18-39
Levofloxacin (L)	58 (14)	100 (19)	121 (24)	73 (27)	75 (22)	69 (25)	48 (18)	16 (7.3)	7-27
Amoxicillin	6 (1)	0 (0)	0 (0)	0 (0)	4 (1.2)	1 (0.4)	0 (0)	0 (0)	<1
Tetracycline	2 (0.5)	1 (0.2)	0 (0)	1 (0.4)	0 (0)	0 (0)	1 (0.4)	0 (0)	<1.4
Dual (C+M)	56 (13)	64 (12)	77 (15)	45 (17)	41 (12)	34 (12)	35 (13)	16 (7.3)	7-17
Triple (C+M+L)	22 (5.2)	31 (6)	45 (9)	26 (10)	19 (5.5)	16 (6)	11 (4.1)	2 (1)	1-10

Conclusion: In naïve patients, *H. pylori* resistance to clarithromycin remained above 15% throughout the period 2013-2020. A progressive decrease in metronidazole (as well as dual clarithromycin and metronidazole) and levofloxacin resistance was observed.

L. Bujanda: None. O. P. Nyssen: None. D. Vaira: None. G. Fiorini: None. I. Maria Saracino: None. F. Lerang: None. S. Georgopoulos: None. B. Tepes: None. F. Heluwaert: None. A. Gasbarrini: None. T. Rokkas: None. D. Bordin: None. S. Smith: None. D. Lamarque: None. F. Heluwaert: None. V. Lamy: None. R. Muñoz: None. M. Espada: None. E. Resina: None. A. Cano: None. I. Puig: None. F. Mégraud: None. C. O'Morain: None. J.P. Gisbert: None.

P02.18

EXPERIENCE WITH RIFABUTIN-CONTAINING THERAPY IN 426 PATIENTS FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

O. P. NYSSEN[1], *D. VAIRA*[2], *G. FIORINI*[2], *I. SARACINO*[2], *M. CALDAS*[1], *D. BOLTIN*[3], *L. BUJANDA*[4], *R. PELLICANO*[5], *A. KECO-HUERGA*[6], *M. CASTRO-FERNÁNDEZ*[6], *E. OBLITAS SUSANIBAR*[7], *A. DI LEO*[8], *G. LOSURDO*[8], *J. MOLINA-INFANTE*[9], *C. DUEÑAS SADORNIL*[9], *A. GASBARRINI*[10], *Y. NIV*[11], *D. LAMARQUE*[12], *F. HELUWAERT*[13], *S. SMITH*[14], *P. PHULL*[15], *T. ROKKAS*[16], *M. ESPADA*[1], *A. CANO*[17], *F. MEGRAUD*[18], *I. PUIG*[19], *C. O'MORAIN*[14], *J. P. GISBERT*[1], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*
[1]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [2]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [3]Rabin Medical Center, Beilinson Campus and the Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel, [4]Hospital Donostia/Instituto Biodonostia, Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Universidad del País Vasco (UPV/EHU), San Sebastián, Spain, [5]Outpatient clinic, Molinette-SGAS Hospital, University of Turin, Italy, [6]Hospital de Valme, Sevilla, Spain, [7]Consorci Sanitari de Terrassa, Barcelona, Spain, [8]University Hospital Policlinico Consorziale, Bari, Italy, [9]Hospital San Pedro de Alcántara, Cáceres, Spain, [10]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Italy, [11]Rabin Medical Center, Tel Aviv University, Petah Tikva, Israel, [12]Hôpital Ambroise Paré,Université de Versailles St-Quentin en Yvelines, Boulogne Billancourt, France, [13]Centre Hospitalier Annecy Genevois, Pringy, France, [14]Trinity College Dublin, Dublin, Ireland, [15]Aberdeen Royal, Infirmary, United Kingdom, [16]Henry Dunant Hospital, Athens, Greece, [17]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [18]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [19]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, Manresa, Spain.

Background: First-line *H. pylori* treatments have been well evaluated; however, there is a need to identify effective rescue therapies.
Objective: To evaluate the effectiveness and safety of rifabutin-containing regimens.
Methods: International prospective European Registry on *H. pylori* Management (Hp-EuReg) registering all adult patients treated with rifabutin at AEG-REDCap e-CRF until February 2021. Modified intention-to-treat (mITT) and per-protocol (PP) analyses.
Results: Overall 426 (1%) cases were treated with rifabutin, most of them from Italy (64%), Spain (25%) and Israel (8%). Culture (before rifabutin treatment) was performed in 63% of the cases: dual resistance (to both clarithromycin and metronidazole) in 43%, and triple resistance (to clarithromycin, metronidazole and levofloxacin) in 38%. Rifabutin was mainly used in second- (32%), third- (26%), and fourth-line (29%) regimens, achieving 83%, 81% and 63% mITT effectiveness, respectively. Compliance with treatment was 89%. In 91% of cases rifabutin was used in a triple therapy with amoxicillin and a proton-pump-inhibitor achieving a mITT effectiveness of 84% (110 patients) in second-line, 80% (70 patients) in third-line and 64.5% (72 patients) in fourth-line. At least one AE was registered in 28% of the patients (most frequently nausea and asthenia) and one serious AE (0.2%) was reported in one patient with leucopenia and thrombopenia with fever requiring hospitalisation.

Conclusion: Rifabutin-containing therapy is safe and effective when one or even multiple previous *H. pylori* eradication treatments have failed.

O. P. Nyssen: None. D. Vaira: None. G. Fiorini: None. I. Saracino: None. M. Caldas: None. D. Boltin: None. L. Bujanda: None. R. Pellicano: None. A. Keco-Huerga: None. M. Castro-Fernández: None. E. Oblitas Susanibar: None. A. Di Leo: None. G. Losurdo: None. J. Molina-Infante: None. C. Dueñas Sadornil: None. A. Gasbarrini: None. Y. Niv: None. D. Lamarque: None. F. Heluwaert: None. S. Smith: None. P. Phull: None. T. Rokkas: None. M. Espada: None. A. Cano: None. F. Megraud: None. I. Puig: None. C. O'Morain: None. J. P. Gisbert: None.

TABLE 1. PRESCRIPTIONS AND EFFECTIVENESS OF RIFABUTIN-CONTAINING REGIMENS BY LINE OF TREATMENT.

	Use, N (%)	mITT, N (%)	95% CI	PP, N (%)	95% CI
Overall	426 (100)	357 (75)	(70-79)	346 (76)	(71-80)
1st line	22 (5)	22 (86)	(65-97)	22 (86)	(65-97)
2nd line	137 (32)	116 (83)	(75-90)	113 (83)	(76-90)
3rd line	109 (26)	87 (81)	(71-89)	84 (82)	(73-91)
4th line	122 (29)	102 (63)	(53-73)	97 (64)	(54-74)
5th line	27 (6)	23 (57)	(34-79)	23 (56)	(34-79)
6th line	9 (2)	7 (71)	(29-96)	7 (71)	(29-96)

mITT: modified intention-to-treat; PP: per-protocol, N: total number of patients analysed.

P02.19

NON-BISMUTH QUADRUPLE CONCOMITANT TREATMENT FOR *H. PYLORI* ERADICATION: SYSTEMATIC REVIEW AND META-ANALYSIS

M. ESPADA, ***O. P. NYSSEN****, J. P. GISBERT*
Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain.

Background: *Helicobacter pylori* eradication with standard triple therapy fails in ≥20% of the cases. Non-bismuth quadruple concomitant therapy is among the recommended first-line treatments.
Aim: To evaluate the efficacy and safety of non-bismuth quadruple concomitant therapy (proton pump inhibitor, clarithromycin, amoxicillin and nitroimidazole), and to compare it with other triple and quadruple regimens.
Methods: Bibliographical searches up to July 2020. Meta-analysis evaluating concomitant therapy as first-line regimen and RCTs comparing concomitant vs. standard triple, sequential, hybrid, and bismuth quadruple therapies.
Results: Overall, 107 studies (55 RCTs) were included (29,268 patients). Concomitant regimen achieved an overall efficacy of 87% (95%CI=86-88%) by intention-to-treat and 91% (90-92%) per-protocol and high efficacy in clarithromycin (89%) and metronidazole resistance (95%), but lower in dual (clarithromycin and metronidazole) resistance (68%). With same treatment durations, the efficacy by intention-to-treat with concomitant regimen was significantly higher than with triple therapies (RD=0.12;95%CI=0.09-0.15) and with sequential regimen (RD=0.04; 0.01-0.06). However, concomitant was similar to hybrid (RD=-0.00;-0.03-0.03) and to bismuth quadruple therapy (RD=-0.02;-0.09-0.04), with no significant differences. Overall concomitant therapy reported 36% (30-42%) of AEs. With same treatment durations, the incidence of AEs with concomitant therapy was similar to triple therapies (RD=0.03;-0.01-0.08), to sequential regimen (RD=0.03; -0.00-0.06) and to bismuth quadruple therapy (RD=0.01;-0.09-0.11), but higher than with hybrid therapies (RD=0.09;0.02-0.16).
Conclusions: Non-bismuth quadruple concomitant therapy is highly effective (~90%) for *H. pylori* eradication, even with clarithromycin or metronidazole resistance, being superior to standard triple and sequential therapies, and similar to hybrid and bismuth quadruple regimens.

M. Espada: None. O.P. Nyssen: None. J.P. Gisbert: None.

P02.20

ERADICATION OF *HELICOBACTER PYLORI*: META-ANALYSIS-BASED OR REGISTRY-BASED? A PERSONAL VIEW.

G. M. BUZÁS
Ferencváros Health Service Non-Profit Ltd, Budapest, Hungary.

Introduction: Registries have recently emerged as valuable databases reflecting the actual results and time-trends of therapeutic methods.
Aim: Comparison of the results of first-line regimens used for the eradication of *H. pylori* as published in the European Registry on *H. pylori* management[1] with the results of meta-analyses.
Method: The results of most-used empirical first-line treatments between 2013 and 2018 were extracted from the Registry and from the high quality meta-analyses performed between 2015 and 2020. Results of the triple, sequential, concomitant and bismuth-based quadruple regimens were analysed on an ITT and PP basis.
Results: PPI+A+C regimen achieved rates of 68.0 and 84.6 on ITT/PP basis according to the registry,-similar to those obtained in meta-analyses (74.8/81.3%). Concomitant treatment (PPI+C+A+M) obtained comparable rates of eradication (86.2/90.4 and 86.0/92.5%, respectively). Bismuth-based quadruple therapy (PPI+C+A+B) obtained similar results (82.8/90.8 vs 84.6/92.4%). Sequential treatment (PPI+C+A+T) obtained comparable results on PP basis (92.1% *vs.* 90.1%). PPI+single capsule regimen achieved 95.5% on PP basis according to the registry and 95.0% in a meta-analysis.
Conclusion: The data of the registry are consistent with the results of meta-analyses. Triple therapy achieved suboptimal results. Concomitant, bismuth based quadruple and single capsule regimens all obtained over 90% rates on PP basis, with no difference between the databases. The implementation of registry data into the guidelines should be welcomed: their grade of evidence remains to be determined.
Abbreviations: A: amoxicillin; B: bismuth compound; C: clarithromycin; M: metronidazole; PPI: proton pump inhibitor, T: tinidazole.

1 Nyssen OP et al. Gut 2021; 70 (1): 40-54, doi:10.1136/gutjnl-2020-321372
G.M. Buzás: None.

P02.21

EFFICACY AND SAFETY OF VONOPRAZAN-BASED QUADRUPLE REGIMENS FOR THE ERADICATION OF *HELICOBACTER PYLORI* IN CHINESE PATIENTS WITH PEPTIC ULCER: A POOLED ANALYSIS OF TWO PHASE III TRIALS

X. HOU[1], *J. WANG*[2], *Q. DU*[3], *F. ZHOU*[4], *L. XIE*[5], *L. GU*[6], *K. KUDOU*[7], *S. ZHANG*[8];
[1]Department of Gastroenterology, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China, [2]Department of Gastroenterology, China-Japan Union Hospital, Jilin University, Changchun, China, [3]Department of Gastroenterology, The Second Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China, [4]Takeda Pharmaceutical Company, Shanghai, China, [5]Takeda Pharmaceutical Company, Beijing, China, [6]Takeda Development Center Asia, Shanghai, China, [7]Takeda Pharmaceutical Company, Osaka, Japan, [8]Department of Gastroenterology, Beijing Friendship Hospital, Capital Medical University, Beijing, China.

Helicobacter pylori infection is highly prevalent in Asia. This pooled analysis of the Chinese subpopulation from two randomized, double-blind, doubledummy, phase III studies explored the efficacy and safety of vonoprazan in treating *H. pylori* infection.
Patients were randomized 1:1 to receive 20 mg vonoprazan or 30 mg lansoprazole once-daily for up to 6 or 8 weeks, whereby *H. pylori*–positive (HP+) patients received vonoprazan- or lansoprazole-based quadruple bismuth-containing therapy (vonoprazan 20 mg/lansoprazole 30 mg, amoxicillin 1 g, clarithromycin 500 mg, bismuth potassium citrate/bismuth tripotassium dicitrate 600 mg, all twice-daily) for the first 2 weeks. *H. pylori* eradication was determined by carbon-13 urea breath test at a follow-up visit 4 weeks after treatment.

At baseline, 270 and 279 patients with peptic ulcers were HP+ in the vonoprazan and lansoprazole arms, respectively. Most patients had duodenal ulcers. *H. pylori* eradication was achieved in 92.0% (231/251) and 86.0% (208/242) of patients receiving vonoprazan and lansoprazole, respectively (difference: 6.1%; 95% CI: 0.515, 11.733; the lower bound of CI was above the prespecified non-inferiority margin of –10%). *H. pylori* eradication was 6.6% (95% CI: 0.862, 12.545) and 12.1% (95% CI: 2.600, 22.262) higher in patients aged <65 years and current smokers, respectively, with vonoprazan vs lansoprazole. The proportion of HP+ patients experiencing treatment-emergent adverse events with onset ≤14 days after treatment (*H. pylori* eradication period) was 23.0% (62/270) and 28.7% (80/279) with vonoprazan and lansoprazole, respectively.
H. pylori eradication rate with vonoprazan was non-inferior to lansoprazole and exceeded 90%, a clinically relevant threshold for determining the efficacy of *H. pylori* eradication regimens.

X. Hou: None. J. Wang: None. Q. Du: None. F. Zhou: A. Employment (full or part-time); Modest; Takeda Pharmaceutical Company Ltd, China. L. Xie: A. Employment (full or part-time); Modest; Takeda Pharmaceutical Company Ltd, China. E. Ownership Interest (stock, stock options, patent or other intellectual property); Modest; Takeda Pharmaceutical Company Ltd, China. L. Gu: A. Employment (full or part-time); Modest; Takeda Development Center Asia, China. K. Kudou: A. Employment (full or part-time); Modest; Takeda Pharmaceutical Company Ltd, Japan. S. Zhang: None.

P02.22

EXPLORING THE POTENTIAL OF BIO-ACTIVE COMPONENTS OF *MORINDA CITRIFOLIA* AND ITS INTERACTION WITH THE *HELICOBACTER PYLORI* ONCOGENIC PROTEIN CAGA

A. BHATTACHARJEE, P. PANDEY, ***O. MUKHERJEE***
National institute of Technology, Durgapur, India.

India is one of the prototypical developing country for *Helicobacter pylori (H. pylori)* infection, with nearly 70% of the population infected with the bacteria; and more than 20 million Indians estimated to suffer from peptic ulcer disease. Recurrent infections and emergence of a large number of multi-drug resistance strains have led to an increasing demand for the identification of newer drug candidates, particularly those derived from ethnobotanical sources. *Morinda citrifolia*, or the Indian Mulberry has been widely quoted in all forms of ancient Indian medicine including Ayurveda for digestive disorder treatment and as an immune modulator, although there is no scientific mechanism suggested for its anti-gastritis effect. Thus our present study is focussed on the identification of active compounds present in *Morinda citrifolia* and understands its interaction with *H. pylori* virulence factors, particularyly cagA. In our study, 45 of the majorly reported active compounds were initially screened through ADMET analysis and later docked into the active site of CagA to evaluate their binding affinities. Initial docking studies predict Beta Sitosterol, Beta Carotenes and Rutin as the best probable candidates. This will be followed by 2D-QSAR analysis and in-vitro analysis of these active compounds for their potential use as antimicrobial and/or inhibitors of CagA.

A. Bhattacharjee: None. P. Pandey: None. O. Mukherjee: None.

P02.23

GELLAN GUM HYDROGELS AS A PH-RESPONSIVE SYSTEM TO CONTROL THE GASTRIC DELIVERY OF HIGHLY EFFECTIVE ANTIMICROBIAL MICROSPHERES AGAINST *HELICOBACTER PYLORI*

D. R. FONSECA[1,2,3], *A. MOURA*[1,2], *C. L. SEABRA*[1,2], *S. GOMES*[1,2], *J. M. OLIVEIRA*[4,5], *R. L. REIS*[4,5], *V. LEIRO*[1,2], *B. N. ESTEVINHO*[6], *C. TEIXEIRA*[7], *P. GOMES*[7], *P. PARREIRA*[1,2], *M. L. MARTINS*[1,2,8]

[1]i3S, Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Porto, Portugal, [2]Instituto de Engenharia Biomédica, Universidade do Porto, Porto, Portugal, [3]Faculdade de Engenharia, Departamento de Engenharia Metalúrgica e de Materiais, Universidade do Porto, Porto, Portugal, [4]3B's Research Group, I3Bs - Research Institute on Biomaterials, Biodegradables and Biomimetics of University of Minho, Headquarters of the European Institute of Excellence on Tissue Engineering and Regenerative Medicine, Avepark, Barco, Guimarães, Portugal, [5]ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal, [6]LEPABE, Departamento de Engenharia Química, Faculdade de Engenharia da Universidade Do Porto, Rua Dr. Roberto Frias, 4200-465, Porto, Portugal, [7]LAQV-REQUIMTE, Departamento de Química e Bioquímica, Faculdade de Ciências, Porto, Portugal, [8]ICBAS, Instituto de Ciências Biomédicas Abel Salazar, Porto, Portugal.

Helicobacter pylori (Hp) is one of the sixteen bacteria that ranks higher concerning antibiotic's resistance and as a threat to human health[1]. Antimicrobial peptides (AMPs)are an innovative alternative due to their broad-spectrum activity and low propensity of bacterial resistance. MSI-78A, an AMP with reported *Hp* bactericidal activity[2], was grafted onto chitosan microspheres (AMP-ChMic) to boost the AMP effect *in situ*. These AMP-ChMic were incorporated into a pH-responsive system to achieve gradual gastric release.MSI-78A was grafted onto chitosan microspheres (produced by spray-dryer) in a controlled orientation using a heterobifunctional spacer (NHS-PEG_{113}-MAL). AMP-ChMic, with diameter ranging from 2 to 7 µm, stable in acidic and neutral pH, demonstrated bactericidal effect against *Hp* J99(highly pathogenic human strain) at lower concentrations than the peptide in solution (≈277 µg *vs.* 512 µg, respectively). The attraction of AMP-ChMic and *Hp* enabled that ≈10 bacteria were killed by 1 single microsphere through membrane destabilization and cytoplasm release.Low acyl gellan gum(LAGG) hydrogels(1.5%w/v) were studied as a pH responsive system for AMP-ChMic controlled release. LAGG hydrogels were prepared as described elsewhere[3] using a modified protocol to incorporate ChMic (1mg/mL). ChMic release was evaluated over one week in different pHs mimicking those of gastric settings (2.6&7.0). AMP-ChMic delivery occurred in all conditions, demonstrating the potential of this strategy for *in situ* delivery.This microsphere-based innovative approach boosted the activity of MSI-78A and LAGG hydrogels are a suitable strategy for AMP-ChMic controlled release, to achieve non-antibiotic *Hp* eradication.

Acknowledgments: PTDC/CTM-BIO/4043/2014&SFRH/BD/146890/2019&CEECIND/01210/2018

[1]Dong *et al. Nat Rev Gastroenterol Hepatol.*(2017)
[2]Neshani *et. al.Helicobacter.*24(2019)
[3]Pereira *et. al.Key Engineering Materials*.587(2014)

D.R. Fonseca: None. A. Moura: None. C.L. Seabra: None. S. Gomes: None. J.M. Oliveira: None. R.L. Reis: *None. V. Leiro: None. B.N. Estevinho: None. C. Teixeira: None. P. Gomes: None. P. Parreira: None. M.L. Martins: None.*

P02.24

COMPARATIVE EFFICACY OF ERADICATION TRIPLE, SEQUENTIAL THERAPY AND QUADRUPLE-THERAPY IN PATIENTS AFTER COVID-19

***V. KRYVY**, I. KLYARYTSKA, I. ISKOVA, T. TSAPYAK*
Medical Academy named after S.I. Georgievsky of Vernadsky CFU, Simferopol, Russian Federation.

Aims: Clarithromycin triple, sequential therapy and bismuth quadruple eradication therapy is advised as first-line therapy for *Helicobacter pylori* (*H. pylori*) eradication by current guidelines. A many lot of patients with peptic ulcer and chronic gastritis after coronavirus disease 2019 (COVID-19), that treated antibacterial therapy. This situation requires an assessment of the effectiveness of standard regimens in patients after COVID-19.
Methods: We studded 68 patients (mean age 32.1±6.4 years) with gastrointestinal symptoms developed after COVID-19 requiring antibacterial therapy. Group A (22 patients) was given clarithromycin standard triple therapy for 14 days, group B (23 patients) - a sequential regimen consisted of rabeprazole 20 mg and amoxicillin 1 g for 7 days, followed by rabeprazole 20 mg, clarithromycin 500 mg, and metronidazole 500 mg for the next 7 days, all given twice daily, group C (23 patients) - quadruple-therapy with rabeprazole, tetracycline, metronidazole and bismuthi subitras for 14 days. Eradication was confirmed by 13C-urea breath test.
Results: The intention-to-treat (ITT) eradication rate was 45.4% (10/22) for triple, 65.2% (15/23) for sequential and 82.6% (19/23) for bismuth-based quadruple therapy. The per-protocol (PP) cure rate was 47.6% (10/21) for triple, 75.0% (15/20) for sequential and 90.5% (19/21) for bismuth-based quadruple therapy. There was no significant difference in compliance and side-effects rates among the protocols.
Conclusions: The bismuth-based quadruple therapy achieved a high eradication rate for first-line *H. pylori* therapy in patient after COVID-19.

V. Kryvy: None. I. Klyarytska: None. I. Iskova: None. T. Tsapyak: None.

P02.25

EFFECTIVE ERADICATION REGIMEN AND DURATION ACCORDING TO THE RESULTS OF CLARITHROMYCIN SUSCEPTIBILITY OF *HELICOBACTER PYLORI*

***B. KIM**, S. NA, Y. CHOE, J. KIM*
The Catholic University of Korea, Incheon, Korea, Republic of.

Background/Aims: Recently, using Dual Priming Oligonucleotide-Based Multiplex Polymerase Chain Reaction (DPO-PCR), it was possible to detect *Helicobacter pylori* and identify point mutations that cause clarithromycin resistance. The aim of this study was to investigate the duration of effective triple therapy in the clarithromycin susceptible group and of quadruple therapy in the resistant group based on DPO-PCR results, respectively.
Methods: We retrospectively analyzed the electronic medical records of 184 patients who received eradication therapy after *H. pylori* were detected and clarithromycin resistance was confirmed through DPO-PCR from September 2019 to December 2020. These patients were treated with 1- or 2-week triple therapy (lansoprazole 40 mg bid, amoxicillin 1000 mg bid, clarithromycin 500 mg bid) in the clarithromycin susceptible group or 1- or 2-week quadruple therapy (lansoprazole 40 mg bid, tripotassium dicitrate bismuthate 300 mg qid, metronidazole). 500 mg tid, and tetracycline 500 mg qid) in the clarithromycin resistance group.
Results: In the clarithromycin susceptible group, per-protocol analyses showed an eradication rate of 87.5% (42/48, 95% CI: 77.1-95.8%) for 1-week and 87.2% (41/47, 78.7-95.7%) for 2-week therapy (p=0.969), respectively. The eradication rate in the clarithromycin resistance group was 91.4% (32/35, 80.0-100.0%) in 1-week and 90.3% (28/31, 77.4-100.0%) in 2-week therapy (p=0.876), respectively. There was no significant difference in the eradication rate, patient compliance, or rate of adverse events between the 1-week and 2-week therapy on both groups.
Conclusions: One-week eradication therapy is enough after DPO-PCR based clarithromycin susceptibility test compared to two-week therapy.

B. Kim: None. S. Na: None. Y. Choe: None. J. Kim: None.

P02.26

CHARACTERISTICS OF EMPIRICAL FIRST- AND SECOND-LINE TREATMENT PRESCRIBED BETWEEN 2013-2020: ITALIAN DATA FROM THE EUROPEAN REGISTRY ON *H. PYLORI* MANAGEMENT (HP-EUREG)

L. GATTA[1], *G. FIORINI*[2], *I. M. SARACINO*[2], *M. PAVONI*[2], *M. ROMANO*[3], *A. GRAVINA*[3], *L. GRANATA*[3], *R. PELLICANO*[4], *A. GASBARRINI*[5], *A. DI LEO*[6], *G. LOSURDO*[6], *F. FRANCESCHI*[7], *G. NARDONE*[8], *A. ROCCO*[8], *M. P. DORE*[9], *F. FARINATI*[10], *M. GHISA*[10], *I. PUIG*[11], *O. P. NYSSEN*[12], *F. MÉGRAUD*[13], *C. O'MORAIN*[14], *D. VAIRA*[2], *J. P. GISBERT*[12], *ON BEHALF OF THE HP-EUREG INVESTIGATORS*

[1]Gastroenterology Unit, Versilia Hospital, Lido di Camaiore, Italy, [2]Department of Surgical and Medical Sciences, University of Bologna, Bologna, Italy, [3]Università degli Studi della Campania "Luigi Vanvitelli", Naples, Italy, [4]Molinette-SGAS Hospital, University of Turin, Turin, Italy, [5]Medicina Interna, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [6]University Hospital Policlinico Consorziale, Bari, Italy, [7]Emergency Medicine, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [8]Gastroenterology Unit, Department of Clinical Medicine and Surgery, University Federico II of Naples, Naples, Italy, [9]Department of Medical, Surgical and Experimental Science, University of Sassari, Sassari, Italy, [10]Gastroenterology Unit, Department of Surgery, Oncology and Gastroenterology, University Hospital of Padua, Padua, Italy, [11]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [12]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid, and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [13]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [14]Trinity College Dublin, Dublin, Ireland.

Background: Evidence on the empirical treatment schemes, length, and power of acid inhibition used to eradicate *H. pylori* in first- and second-line is scarce.
Aims & Methods: Performing an analysis of empirically prescribed first- and second-line regimens, duration, and power of acid inhibition of PPIs used in Italy evaluating the European Registry on *H. pylori* Management (Hp-EuReg). The Hp-EuReg is an international multicentre prospective non-interventional registry recording information of *H. pylori* infection management. Data of all *H. pylori* positive patients enrolled from 2013 to March 2020 by the Italian centres participating to the Hp-EuReg, who were empirically prescribed a first- or second-line treatment, were analysed. PPIs data were standardised using the PPI acid inhibition potency as defined by Kirchheiner *et al.* (Eur J Clin Pharmacol 2019), and Graham *et al.* (Helicobacter 2019), and classified as low, standard and high dose PPI.
Results: First-line included 2,996 patients, and second-line included 797 patients. Data are shown in Table 1.
Conclusions: According to the data from Hp-EuReg, it seems that in Italy prescription of *H. pylori* treatments is adapting to the new evidence such as reducing the use of triple therapies and increasing the duration of treatment, and the dose of PPIs.

L. Gatta: None. G. Fiorini: None. I.M. Saracino: None. M. Pavoni: None. M. Romano: None. A. Gravina: None. L. Granata: None. R. Pellicano: None. A. Gasbarrini: None. A. Di Leo: None. G. Losurdo: None. F. Franceschi: None. G. Nardone: None. A. Rocco: None. M.P. Dore: None. F. Farinati: None. M. Ghisa: None. I. Puig: None. O.P. Nyssen: None. F. Mégraud: None. C. O'Morain: None. D. Vaira: None. J.P. Gisbert: None.

TABLE 1. CHARACTERISTICS OF PRESCRIPTIONS TRENDS OF FIRST- AND SECOND-LINE EMPIRICAL TREATMENTS IN THE ITALIAN CENTRES PARTICIPATING TO THE HP-EUREG STUDY BETWEEN 2013 AND 2020.

Year of enrolmentq	2013	2014	2015	2016	2017	2018	2019	2020	Overall
First line treatment									
Treatment schemes									
Triple PPI-C-A	34.7%	8.7%	2.0%	0.7%	19.3%	16.0%	12.7%	5.3%	5.5%
Triple PPI-L-A	7.4%	3.7%	3.7%	0%	9.3%	7.4%	25.9%	40.7%	2.0%
Sequential (PPI + C-A-T/M)	10.3%	15.7%	14.1%	3.2%	19.1%	18.7%	12.0%	6.9%	61.2%
Concomitant (PPI + C-A-M/T)	0.4%	1.4%	28.1%	29.2%	22.1%	9.3%	3.9%	5.0%	10.3%
PPI + Pylera® (M+Tc+B)	0.0%	0.0%	0.0%	39.8%	9.9%	17.4%	25.2%	7.8%	21.0%
Length of treatment									
7 days	39.3%	11.2%	4.5%	0.0%	13.5%	19.1%	7.9%	4.5%	3%
10 days	8.6%	12.4%	12.4%	11.7%	15.8%	17%	14.7%	7.5%	91%
14 days	0.0%	0.0%	4%	34%	31%	14%	8%	8%	6%
PPI acid inhibition									
Low	4.5%	4.8%	1.6%	3.0%	24.9%	27.8%	20.2%	13.0	48.7%
Standard	33.3%	7.1%	2.4%	0.0%	21.4%	23.8%	9.5%	2.4%	1.5%
High	11.1%	18.5%	23.0%	23.0%	7.4%	5.7%	8.7%	2.5%	49.8%
Second line treatment									
Treatment schemes									
Triple PPI-R-A	3.9%	12.5%	37.5%	10.2%	0.8%	6.3%	21.1%	7.8%	21.1%
Triple PPI-L-A	13.4%	8.5%	19.4%	10.4%	10.4%	15.9%	15.9%	6.0%	33.0%
Sequential (PPI + C-A-T/M)	15.7%	24.3%	15.7%	4.3%	1.4%	24.3%	10.0%	4.3%	11.5%
Concomitant (PPI + C-A-M/T)	0.0%	80.8%	19.2%	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%
PPI + Pylera® (M+Tc+B)	0.0%	0.0%	0.5%	20.2%	10.4%	29.0%	31.1%	8.7%	30.1%
Length of treatment									
7 days	0.0%	0.0%	0.0%	16.7%	0.0%	50%	33.3%	33.2%	1.1%
10 days	8.6%	14.1%	11.7%	11.5%	9.0%	21.2%	18.0%	5.9%	95.3%
14 days	0.0%	1.3%	0.4%	0.5%	0.2%	0.2%	0.2%	0.9%	3.6%
PPI acid inhibition									
Low	2.6%	4.5%	3.5%	8.1%	13.5%	27.4%	29.7%	10.6%	47.8%
Standard	26.1%	21.7%	4.3%	4.3%	0%	30.4%	4.3%	8.7%	3.5%
High	9.8%	19%	30.8%	16.2%	1.6%	8.9%	10.8%	2.9%	48.6%

A, amoxicillin; B, bismuth salt; C, clarithromycin; L, levofloxacin; M, metronidazole; PPI, proton pump inhibitor; R, rifabutin; T, tinidazole; Tc, tetracycline.

P02.27

TUNING UP NANOSTRUCTURED LIPID CARRIERS FOR SPECIFIC *HELICOBACTER PYLORI* ERADICATION: EFFECT OF SIZE, CHARGE AND PROTEIN CORONA

R. CHITAS[1,2,3], *C. L. SEABRA*[4], *C. NUNES*[4], *P. PARREIRA*[1,2], *M. C. L. MARTINS*[1,2,3]

[1]i3S - Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Porto, Portugal, [2]INEB - Instituto de Engenharia Biomédica, Universidade do Porto, Porto, Portugal, [3]ICBAS - Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto, Porto, Portugal, [4]LAQV-REQUIMTE, Departamento de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, Porto, Portugal.

The main treatments to counteract *Helicobacter pylori* (Hp) infection are failing, mainly due to the increase of antibiotic resistance[1]. Previously, drug-free nanostructured lipid carriers (NLC) were developed for Hp eradication[2,3]. This work aims to optimize NLC efficiency in terms of surfactant composition, size and charge to achieve complete Hp eradication and to decipher the effect of NLC's protein corona on their specificity towards Hp.

NLC were produced by hot homogenization and ultrasonication using lipids (Precirol ATO5®&Miglyol-812®)[2,3] and three surfactants: Tween®60(NLC60), Tween® 80 (NLC80) and Cetyltrimethylammonium bromide-CTAB(NLC-CTAB). NLC60 were produced in three different sizes ($NL60_{small}$<200nm, $NL60_{medium}$≈260nm, $NL60_{large}$>400nm) based on sonication parameters (amplitude and time). The effect of charge was studied using NLC60(anionic) and NLC-CTAB (cationic). All NLC were tested *in vitro* against Hp J99 strain and other gut bacteria (*Escherichia coli* ATCC®25922™ and *Lactobacillus acidophilus*-01) in Mueller Hinton Broth (MHB) supplemented with 10%(v/v) inactivated fetal bovine serum (FBS), during 24h. NLC60 protein corona was analyzed by mass spectrometry (MS).
NLC60 and NLC80 reached complete Hp eradication at 10^{12} particles/ml and didn't affect the other gut bacteria. NLC-CTAB were more bactericidal, achieving complete Hp eradication at 10^{11} particles/ml and in *L. acidophilus*-01 at the same concentration. $NLC60_{large}$ showed better performance, achieving bactericidal activity at 10^{11} particles/ml. NLC60 protein corona seems to mask the nanoparticles, delaying its effect in Hp and blocking their effect in *E. coli*.
In conclusion, the physicochemical properties and protein corona influence the NLC bactericidal activity. These results further support NLC therapeutic potential against Hp gastric infection.

R. Chitas: None. C.L. Seabra: None. C. Nunes: None. P. Parreira: None. M.C.L. Martins: None.

1.Malfertheiner *et al.Gut*.2017.
2.Seabra *et al.Int J Pharm*.2017.
3.Seabra *et al.Eur J Pharm Biopharm*.2018.

P02.28

PPI-AMOXICILLIN DUAL THERAPY FOUR TIMES DAILY IS SUPERIOR TO GUIDELINES-RECOMMENDED REGIMENS IN THE *HELICOBACTER PYLORI* ERADICATION THERAPY: A SYSTEMATIC REVIEW & META-ANALYSIS

***C. LI**, Y. SHI, B. SUO, X. TIAN, Z. SONG;*
Peking University Third Hospital, Beijing, China.

Background: Systematic reviews suggested that the eradication efficacy of PPI-amoxicillin dual therapy is similar to that of other commonly used regimens. However, it might be affected by the medication frequency. Basic and clinical studies have shown that dual therapy administered four times daily has a reliable pathophysiological basis and could achieve satisfactory efficacy. Therefore, a systematic review of RCTs of dual therapy and other regimens was conducted to clarify whether dual therapy is superior to guidelines-recommended regimens.
Materials and Methods: The RCTs comparing dual therapy with other regimens were subjected to meta-analysis to evaluate the eradication rate, adverse reactions, and compliance using a random-effects model.
Results: Dual therapy administered four times daily had a higher eradication rate than other regimens (intention-to-treat analysis: 89.7% vs 84.6%, OR: 1.52, 95%CI 1.08-2.14, p=0.02; per-protocol analysis: 92.6% *vs.* 88.2%, OR: 1.54, 95%CI 1.01-2.34, p=0.04). In first-line therapy, according to intention-to-treat analysis, the eradication rate of dual therapy was higher than other regimens (89.8% vs 84.2%, OR: 1.63, 95%CI 1.02-2.61, p=0.04). In per-protocol analysis, dual therapy showed better efficacy than others (92.9% vs 88.3%, OR: 1.68, 95% CI 0.98-2.89, p=0.06), but not significantly. In salvage treatment, no significant difference was detected. The safety of dual therapy was significantly better than other regimens (19.6% *vs.* 36.7%, p<0.01), but no difference was observed in compliance (p=0.58).
Conclusion: PPI-amoxicillin dual therapy administered four times daily has better efficacy and safety in *H. pylori* eradication than current guidelines-recommended regimens, especially in first-line therapy, and mainly in Asia.

C. Li: None. Y. Shi: None. B. Suo: None. X. Tian: None. Z. Song: None.

P02.29

COMPARISON OF THE READING OF CLARITHROMYCIN E-TEST ON *HELICOBACTER PYLORI* BY EYE AND WITH MICROSCOPE

***M. YUSIBOVA**, L. PERCIVAL ANDERSEN*
Department of Clinical Microbiology, København Ø, Denmark.

Introduction: Antibiotic resistance in *H. pylori* is an increasing problem worldwide with regional differences in resistant rates. Antibiotic susceptibility testing mainly relies on culture and phenotypic drug susceptibility testing that can be both time consuming and uncertain. Visual inspection and determination of MICs on the E-test strips leaves room for personal interpretation and is challenged by the formation of almost invisible microcolonies of resistant strains that can be left undetected. The aim of this study was to compare the results of reading the E-test by eye and with a microscope.
Methods: The study was conducted on 15 previously E-tested *H. pylori* strains collected from Danish patients with an indication for gastroscopy between January 2017 - 2019. The strains were cultivated and E-tested for clarithromycin. E - tests were read by eye and microscope at the third, fourth and fifth day from making the E-test, to reveal a possible difference in results.
Results: The study showed 3 out of 15 strains to have visible clarithromycin resistant microcolonies which were only detected when reading the E-test with microscope. The 3 strains had already been registered as clarithromycin sensitive by the routine E-testing. A picture was obtained of the microcolonies through the microscope.
Conclusion: This study revealed the possibility of overlooking clarithromycin resistant microcolonies when reading the E-test by eye. Prescription of clarithromycin to a patient from which a sample of *H. pylori* with resistant microcolonies has been collected, can result in selection of the resistant clones and treatment failure as a result.

M. Yusibova: None. L. Percival Andersen: None.

P02.30

ADDITION OF *SACCHAROMYCES BOULARDII* TO STANDARD TRIPLE THERAPY IN ERADICATION OF *H. PYLORI*: ADVERSE EVENTS AND COMPLIANCE

***O. SJOMINA**[1,2], J. SUHORUKOVA[2,3], A. RŪDULE[2], R. VANGRAVS[2], D. PŪPOLA[2], S. PARŠUTINS[2], I. POĻAKA[2], I. DAUGULE[1,2], I. STONĀNS[2], M. LEJA[1,2]*
[1]Faculty of Medicine, University of Latvia, Riga, Latvia, [2]Institute of Clinical and Preventive Medicine, Riga, Latvia, [3]Daugavpils Regional Hospital, Daugavpils, Latvia.

Background: A wide spectrum of adverse events by eradication may lead to therapy discontinuations and decrease of eradication rates. *Saccharomyces boulardii* addition to standard clarithromycin-based *H. pylori* eradication regimen is associated with lower harms related to less frequent induction of gut resistome and better profile of adverse events.
Objective: to compare the compliance and frequency of adverse events related to standard clarithromycin-based *H. pylori* eradication regimen after adding *Saccharomyces boulardii*.
Methods: Clinical trial participants were healthy individuals aged 40-64. Eradication subgroup underwent urea breath test; positive patients were randomly allocated into four eradication subgroups - standard triple therapy (Amoxicillin 1000mg x 2, Clarithromycin 500mg x2 and Esomeprazole 40mg x2) 10 or 14 days with or without addition of 500 mg *Saccharomyces boulardii*. Patients were called in 21-28 days; adverse events and patients' compliance were registered.
Results: By now, we acquired data from 265 patients. Overall, adverse events were reported by 43.4%. The addition of *Saccharomyces boulardii* showed a general tendency to lower frequency of adverse events, in particular diarrhoea in 14-day regimen (p=0.02, OR 2.7). The compliance in groups with and without probiotics was equal.
Conclusion: Lower frequency of adverse events increases chance of positive outcome. The ongoing research on efficacy and resistome induction in subgroups will complement the results.

O. Sjomina: None. J. Suhorukova: None. A. Rūdule: None. R. Vangravs: None. D. Pūpola: None. S. Paršutins: None. I. Poļaka: None. I. Daugule: None. I. Stonāns: None. M. Leja: None.

TABLE 1. THE SPECTRUM OF ADVERSE EVENTS IN THERAPY SUBGROUPS.

	10 days -	10 days +	p-value	OR (95% CI)	14 days -	14 days +	*p*-value	OR (95% CI)
Reported adverse events, n (%)	15 (40.5)	32 (40.0)	0.95	1.0 (0.46-2.26)	34 (52.5)	34 (41.0)	0.17	1.6 (0.82-3.04)
Compliance, n (%)	36 (97.3)	79 (98.8)	0.58	2.2 (0.13-36.08)	61 (93.8)	78 (94.0)	0.98	1.0 (0.26-3.96)
Diarrhoea	4 (10.8)	10 (12.5)	0.79	0.9 (0.25-2.91)	19 (29.2)	11 (13.3)	0.02*	2.7 (1.18-6.2)
Bitter taste	6 (16.2)	15 (18.8)	0.74	0.8 (0.30-2.37)	14 (21.5)	12 (14.5)	0.26	1.6 (0.69-3.80)
Nausea	2 (5.4)	4 (5.0)	0.92	1.1 (0.19-6.21)	10 (15.4)	7 (8.4)	0.19	2.0 (0.71-5.51)
Abdominal pain	4 (10.8)	3 (3.6)	0.15	3.1 (0.66-14.68)	2 (3.1)	7 (8.4)	0.19	1.3 (0.07-1.72)

- Standard triple therapy without probiotics+ Standard triple therapy with probiotics

P02.31

PRODUCTION OF BIOFILM AS A FEATURE POSITIVELY CORRELATED WITH CLARITHROMYCIN RESISTANCE IN *HELICOBACTER PYLORI*

P. KRZYŻEK[1]*, P. MIGDAŁ*[2]*, G. GOŚCINIAK*[1]
[1]Department of Microbiology, Faculty of Medicine, Wroclaw Medical University, Wrocław, Poland, [2]Department of Environment, Hygiene and Animal Welfare, Wroclaw University of Environmental and Life Sciences, Wrocław, Poland.

Introduction: It is widely accepted that the production of biofilm is a protective mechanism against various types of stressors, including exposure to antibiotics. However, the impact of this structure on the spread of antibiotic resistance in *Helicobacter pylori* is still poorly understood.
Aim: Therefore, the aim of this study was to determine the relationship between biofilm production and the presence of antibiotic resistance in *H. pylori*. Methods: The studies were carried out on 24 clinical *H. pylori* strains with different resistance (antibiotic-sensitive, monoresistant, double-resistant and multidrug-resistant) against clarithromycin, metronidazole and levofloxacin. Determination of resistance was performed using E-tests, while the verification of biofilm formation was performed using the crystal violet staining method.
Results: A strong correlation was found between the amount of biofilm and the presence of clarithromycin resistance (r=0.79). The antibiotic-sensitive strains and those with single resistance to metronidazole or levofloxacin had the lowest biofilm production, while the clarithromycin-monoresistant or the double-resistant (clarithromycin + metronidazole or clarithromycin + levofloxacin) strains had significantly higher production of this structure ($p<0.05$). The multidrug-resistant strains were characterized by the highest degree of biofilm ($p<0.05$).
Conclusions: Resistance to clarithromycin was positively correlated with biofilm formation in the investigated clinical *H. pylori* strains. Further characterization of the strongest biofilm producers seems important in order to understand better the mechanisms governing biofilm development in *H. pylori*.

P. Krzyżek: None. P. Migdał: None. G. Gościniak: None.

P02.32

ASSESSMENT OF FIRST-LINE TREATMENT IN GREECE: DATA FROM THE EUROPEAN REGISTRY ON *HELICOBACTER PYLORI* MANAGEMENT (HP-EUREG)

T. ROKKAS[1]*, S. GEORGOPOULOS*[2]*, S. MICHOPOULOS*[3]*, V. NTOULI*[4]*, C. LIATSOS*[5]*, I. PUIG*[6]*, O. P. NYSSEN*[7]*, F. MÉGRAUD*[8]*, C. O'MORAIN*[9]*, J. P. GISBERT*[10]*;*
[1]Henry Dunant Hospital, Athens, Greece, [2]Athens Medical Paleo Faliron Hospital, Athens, Greece, [3]Alexandra's Hospital, Athens, Greece, [4]Tzaneio General Hospital of Pireaus, Pireaus, Greece, [5]401 Military Hospital, Athens, Greece, [6]Althaia Xarxa Assistencial Universitària de Manresa and Universitat de Vic-Universitat Central de Catalunya (UVicUCC), Manresa, Spain, [7]Hospital Universitario de La Princesa,

Instituto de InvestigMación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid (UAM), and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain, [8]Laboratoire de Bactériologie, Hôpital Pellegrin, Bordeaux, France, [9]Trinity College Dublin, Dublin, Ireland, [10]Hospital Universitario de La Princesa, Instituto de Investigación Sanitaria Princesa (IIS-IP), Universidad Autónoma de Madrid (UAM), and Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd), Madrid, Spain.

Background: *H. pylori* infection is the most common chronic bacterial infection. Its management has to rely on local effectiveness due to the geographical variability of bacterial antibiotic resistance.
Aim: To evaluate treatment effectiveness in Greece as part of Hp-EuReg.
Methods: Infected adult patients were registered at AEG-REDCap e-CRF from June 2013 to 2020. All cases with a first-line treatment were included for analysis. Modified intention-to-treat (mITT) analysis was used for analysis.
Results: Five medical institutions reported data including 547 patients. These patients were treated with the following regimens: concomitant with clarithromycin, amoxicillin and metronidazole (Concomitant-C+A+M) (38%), hybrid with clarithromycin, amoxicillin and metronidazole (Hybrid-C+A+M) (20%), sequential with clarithromycin, amoxicillin and tinidazole (Sequential-C+A+T) (12%), sequential with clarithromycin, amoxicillin and metronidazole (Sequential-C+A+M) (12%), concomitant with clarithromycin, amoxicillin and tinidazole (Concomitant-C+A+T) (8%), triple with clarithromycin and amoxicillin (Triple-C+A) (7%) and other (3%). Triple-C+A, Sequential-C+A+T, Sequential-C+A+M and Concomitant-C+A+T were used from 2013 to 2015. The respective mITT cure rates (95% CI) were 92% (78-98), 87% (76-94), 67% (54-78) and 91% (79-98). Since 2015 patients were also treated with, concomitant-C+A+M and hybrid-C+A+M regimens, with respective mITT cure rates of 90% (85-94) and 88% (80.5-94). Overall compliance, i.e. >90% drug intake, was 99%, Adverse events were reported by 31% of the patients, dysgeusia being the most frequent (15%).
Conclusions: "Optimized" *H. pylori* therapies should achieve ≥ 90% cure rates. In Greece only quadruple concomitant regimens (PPI, clarithromycin, amoxicillin and a nitroimidazole) achieve this target and therefore can be recommended as first-line treatment.

T. Rokkas: None. S. Georgopoulos: None. S. Michopoulos: None. V. Ntouli: None. C. Liatsos: None. I. Puig: None. O.P. Nyssen: None. F. Mégraud: None. C. O'Morain: None. J.P. Gisbert: None.

P02.33

INHIBITORS OF CARBONIC ANHYDRASES AS ANTI-*HELICOBACTER PYLORI* AGENTS

V. PUCA[1], I. VITALE[1], P. LANUTI[2], G. BOLOGNA[2], R. MURARO[3], S. CARRADORI[1], C. CAPASSO[4], C. T. SUPURAN[5], ***R. GRANDE***[1]
[1]Department of Pharmacy, University "G. d'Annunzio", Chieti-Pescara, Chieti, Italy, [2]Department of Medicine and Aging Science, University "G. d'Annunzio", Chieti-Pescara, Chieti, Italy, [3]Department of Innovative Technologies in Medicine & Dentistry, University "G. d'Annunzio", Chieti-Pescara, Chieti, Italy, [4]Department of Biology, Agriculture and Food Sciences, National Research Council (CNR), Institute of Biosciences and Bioresources, Naples, Italy, [5]Neurofarba Department, Section of Pharmaceutical and Nutraceutical Sciences,University of Florence, Sesto Fiorentino, Florence, Italy.

Urease and Carbonic Anhydrases (CAs) are the two enzymes used by *Helicobacter pylori* for surviving in the human stomach. The inhibition of CAs leads to impaired bacterial growth, reduced expression of virulence factors and provides an option to be used in combination with the current arsenal. We assessed the effect of carvacrol and thymol, two natural and selective CAs inhibitors (CAIs) of *H. pylori*, in suppressing biofilm formation through the inhibition of the production of Outer Membrane Vesicle (OMVs), a pivotal component of *H. pylori* biofilm matrix.The Minimal Inhibitory Concentration (MIC) and the Minimal Bactericidal Concentration (MBC) were evaluated through the microdilution method, while the antibiofilm activity was evaluated by assessing the Minimal Biofilm Inhibitory Concentration

through the alamarBlue assay, the CFU count, CV assay and Live/Dead Cell staining followed by fluorescence microscopy analysis. The production of OMVs in the biofilm and planktonic phenotypes as well as the presence of extracellular DNA (eDNA), associated with them, were determined using LCD, PKH26 and PicoGreen staining followed by flow cytometry analysis.The CAIs exhibited a MIC at 128 µg/mL and at sub-MIC doses, the CAIs were able to inhibit *H. pylori* biofilm formation confirmed by a significative reduction in the production of OMVs-eDNA associated. Therefore, CAIs could exert their antibiofilm activity by inhibiting the release of OMVs-eDNA associated, representing innovative anti-*H. pylori* agents which contribute, through the inhibition of the eDNA delivered by OMVs, to limit the horizontal gene transfer and thus, the spread of antibiotic-resistance.

R. Grande: None. V. Puca: None. I. Vitale: None. P. Lanuti: None. G. Bologna: None. R. Muraro: None. S. Carradori: None. C. Capasso: None. C.T. Supuran: None.

P02.34

EFFICACY OF *H. PYLORI* ERADICATION DEPENDING ON GENETIC POLYMORPHISM OF *CYP2C19, MDR1* AND *IL-1B*

N. BAKULINA[1]*, I. SAVILOVA*[1]*, K. ZAGORODNIKOVA*[2]*, I. BAKULIN*[1]
[1]North-Western State Medical University n.a. I.I. Mechnikov, Saint Petersburg, Russian Federation, [2]Almazov National Medical Research Centre, Saint Petersburg, Russian Federation.

Aim: To evaluate an association of genetic polymorphisms *CYP2C19*, *MDR1*, and *IL-1β* on the eradication rate by 10-day modified therapy in patients with *H. pylori* positive.
Materials and methods: Prospective, randomized trial, included 89 *H. pylori* positive patients, divided into 2 groups 10-days therapy b.i.d.: clarithromycin 500 mg, amoxicillin 1000 mg, bismuth subcitrate 240 mg, rabeprazole 20 mg (in 1 group) or 40 mg (in 2 group). 79 subjects underwent pharmacogenetic testing of *CYP2C19, MDR1*, and *IL-1β*.
Results and discussion: The distribution of genotypes: *CYP2C19* normal metabolizers -40.5%, intermediate-20.3%, poor-0%, rapid-29.1%, ultrarapid-10.1%; *MDR1* CC-25.3%, CT-45.6%, TT-29.1%; *IL-1β* CC-38.0%, CT-35.4%, TT-26.6%. Per-protocol (PP) eradication rates in group with rabeprazole 40 mg were 97.6% (41/42; 95%CI 87.7-99.6), in group with rabeprazole 20 mg were 82.1% (32/39; 95%CI 67.3-91.0). Intention-to-treat analysis in group with rabeprazole 40 mg eradication rates were 89.1% (41/46; 95%CI 77.0-95.3), in group with standard dose rabeprazole - 74.4% (32/43; 95%CI 59.8-85.1). No significant differences in eradication rates between the groups of ultrarapid, rapid, normal and intermediate *CYP2C19* metabolizers (PP: 93.5%/90.3%/84.6% respectively; $\chi 2=0.87$, $p=0.65$). Eradication rates in group with *IL-1β* CC genotype there was no difference among the *IL-1β* CT and TT genotype groups (PP: 92.9%/85.7%/94.7% respectively; $\chi 2=1.34$; $p=0.51$). The cure rate among *MDR1*TT genotype was significantly lower than among subjects in the *MDR1* CC/CT genotype groups (PP: 76.2% vs 96.3%: $\chi 2=5.04$; $p=0.025$; OR=8.13).
Conclusion: Ten-day modified triple therapy with high dose rabeprazole significantly high eradication rates. Independent factor for treatment failure is *MDR1* CC/CT genotype status.

N. Bakulina: None. I. Savilova: None. K. Zagorodnikova: None. I. Bakulin: None.

P02.35

DEVELOPMENT OF NEW SYNTHETIC SURFACTANTS WITH ANTI-HELICOBACTER EFFECT

E. ERMOLENKO[1]*, P. FETIN*[2]*, I. ZORIN*[2]*, A. SVARVAL*[3]*, R. FERMAN*[3]*, V. ORLOVA*[1]*, N. GLADYSHEV*[3,2]
[1]Institute of Experimental Medicine, Saint-Petersburg, Russian Federation, [2]Saint-Petersburg State University, Saint-Petersburg, Russian Federation, [3]Saint-Petersburg Pasteur Institute, Saint-Petersburg, Russian Federation.

Introduction: Currently, the search for alternative means of prevention and treatment of diseases of the stomach that occur due to helicobacteriosis is becoming more urgent.
Aim: The aim of this work is to study the antibacterial activity of new surfactants that selectively inhibit the growth of *Helicobacter pylori* (HP).
Material/methods: We examined synthetized by us comb polyelectrolytes of poly-11-acryloyloxyundecyltrimethylammonium bromide (sample 3), the corresponding monomer (sample 2), and a polymer sample with a pyridinium cation of poly-11-acryloyloxyundecylpyridinium bromide (sample 4). A classical surfactant, cetyltrimethylamnium bromide (sample 1), was used as a comparison. Lack of cytotoxicity in the concentrations used was demonstrated in cell cultures. The antagonistic activity of the substances was studied by the drip method by applying them to the surface of the solid nutrient medium on which pure cultures of *Helicobacter pylori* 10, Lactobacillus plantarum 8RA3, Staphylococcus aureus 209, Escherichia coli M17 were sown at a concentration of 6 lg CFU/ml.
Results: All surfactants had a low antagonistic activity against lactobacilli vinimal inhibitory concentration (MIC)> 1000 mcg/ml. For staphylococci and Escherichia, the MIC was >100 mcg/ml, with the exception of sample 1 (MIC 85 mcg/ml). Only sample 1 and sample 2 were active against HP (MIC 10 mcg/ml).
Conclusion: The advantage of sample 2 was not only the micellar form, which provides high adhesion and harmless excretion through the kidneys, but also its selective effect on HP, unlike representatives of the obligatory members of intestinal microbiota, lactobacilli, and Escherichia.

E. Ermolenko: None. P. Fetin: None. I. Zorin: None. A. Svarval: None. R. Ferman: None. V. Orlova: None. N. Gladyshev: None.

P02.36

EVALUATION OF FIRST-LINE BISMUTH CONTAINING 7-DAY QUINTET THERAPY FOR *HELICOBACTER PYLORI* ERADICATION

Y. CHOI*, H. YOON, C. SHIN, Y. PARK, N. KIM, D. LEE;*
Seoul National University Bundang Hospital, Seongnam-si, Korea, Republic of.

Background/aims: Recently, the eradication rate of *helicobacter pylori* infection has decreased to less than 80% because of the increased resistance to clarithromycin. And the need for a new first-line therapy for *H. pylori* with a high eradication rate has become clear. This study aimed to evaluate the efficacy of 7-day bismuth containing quintet therapy as a first-line eradication treatment of *Helicobacter pylori* infection
Methods: This retrospective study included 133 treatment-naive patients with active *H. pylori* infections, who were confirmed through via rapid urease test or histology between October 2015 and October 2020 at Seoul National University Bundang Hospital. All enrolled patients were treated with bismuth containing quintet therapy for 7days: Tripotassium dicitrato bismuth 600mg twice a day, Rabeprazole 20mg twice a day, Amoxicillin 1g twice a day, Metronidazole 500mg twice a day, Moxifloxacin 400mg once a day. Eradication was assessed with urea breath test 6 weeks after treatment completion.
Results: Seven out of the 133 patients dropped out during the study. Intention to treat and per-protocol eradication rates were 85.7% (95% CI, 79.7-91.6) and 90.5% (95% CI, 85.2-95.5). The prevalence of side effects was 29.3%, including dyspepsia (11.0%), epigastric soreness(7.1%), diarrhea(6.3%), black stools(3.2%), abdominal discomfort(1.6%). And most of the side effects were mild.
Conclusions: The 7-day bismuth containing quintet therapy showed excellent eradication effect, compliance and safety as a first-line eradication treatment of *Helicobacter pylori* infection.

Y. Choi: None. H. Yoon: None. C. Shin: None. Y. Park: None. N. Kim: None. D. Lee: None.

P02.37

ADJUVANT THERAPY WITH EUPATILIN IMPROVES THE STATE OF GASTRIC MUCOSA IN PATIENTS WITH *H. PYLORI*-ASSOCIATED CHRONIC GASTRITIS AND DIABETES MELLITUS TYPE 2

***I. SKRYPNYK**, T. RADIONOVA, G. MASLOVA;*
Poltava State Medical University, Poltava, Ukraine.

Background: our previous studies claim that an association of positive *H. pylori* (HP) status and type 2 diabetes mellitus (T2DM) considerably worsen the state of gastric mucosa (GM) in chronic gastritis (CG) patients that needs therapy intensification.
Objective: to investigate the effect of Eupatilin as an adjuvant to antihelicobacter therapy (AHT) on GM of HP-associated CG and T2DM patients.
Materials and methods: 71 HP-associated CG patients (confirmed histologically and with HP antigen stool-test) and concomitant well-controlled T2DM were enrolled in the study. All patients were randomly subdivided on 2 groups: I (n=36) - underwent AHT (Amoxicillin 1000 mg, Clarithromycin - 500 mg, Pantoprazole 40 mg b.i.d. 10 days) with Eupatilin 60 mg t.i.d. 28 days, II (n=35) - underwent only AHT. Upper endoscopy with biopsy and morphometry was performed, levels of N-acetylneuraminic acid (NANA) and fucose were analysed in blood serum before the treatment and 28 days after.
Results: Eupatilin prescription decreased NANA and fucose concentrations in blood serum 3.2 and 1.8 times less respectively compared to the patients who underwent only AHT ($p<0.05$). NANA and fucose levels after the treatment in the group I did not differ statistically from healthy individuals. Morphological examination revealed that average thickness of GM in the group I increased 1.7 times more compared to the thickness before the treatment ($p<0.05$) while in the group II such statistical difference was absent.
Conclusion: Adjuvant therapy with Eupatilin, aimed to improve the state of gastric mucosa, may be beneficial in patients with HP-associated CG and concomitant T2DM.

I. Skrypnyk: None. T. Radionova: None. G. Maslova: None.

P02.38

TREATMENT AND DIAGNOSIS OF HELICOBACTER INFECTION IN UKRAINE: SUCCESSES AND MISTAKES

***Y. V. NIKIFOROVA**, G. D. FADIEIENKO;*
Government Institution "L.T.Malaya Therapy National Institute of the National Academy of Medical Sci, Kharkiv, Ukraine.

The **goal** is analysis of various schemes of anti-*Helicobacter pylori* therapy (AHBT) and methods for diagnosing infection in Ukraine.
Object and methods: 643 patients were examined. The most common nosology was chronic atrophic gastritis (507, 79.0%), Duodenal Ulcer (118, 18.2%), Gastric Ulcer (14, 2.2%), Non Investigated Dyspepsia (2, 0.3%), Functional Dyspepsia (2, 0.3%). For the primary diagnosis of Helicobacter: Histology (384, 59.7%), Serology (142, 22.1%), Rapid Urease Test (96, 14,9%), Stool Antigen Monoclonal Test (10, 1.6%) and Polyclonal (11, 1.7%). Patients received different anti-Helicobacter therapy regimens: Triple (333, 51.8%), Quadruple (297, 46.2%), Dual (2, 0.3%), Other (11, 1.7%). The patient is taking probiotics: No (517, 80.5%), Yes - Probiotic (126, 19.6%). To control the eradication patients underwent: Stool Antigen Monoclonal Test (91, 84.3%), Histology (9, 8.3%), Polyclonal Test (4, 3.7%), Serology (3, 2.8%), Rapid Urease Test (2, 1.9%).
Results and discussion: The main mistakes in patient management are the rare prescription of probiotics (19.6%) and the use of the serological method to control eadication (2.8%). The most effective eradication scheme is Quadruple with the addition of Bismuth salts of tripotassium dicitrate (BTD) lasting 14 days (92.0%), as well as schemes with the inclusion of probiotics during AHBT (eradication efficiency is 90.6%).

Conclusions: Ways to increase the effectiveness of AHTB in Ukraine: adding BTC to therapy and duration of therapy for at least 10-14 days, adding probiotics (*Saccharomyces boulardii CNCM I-745*) to treatment regimens. It is absolutely unacceptable to prescribe a serological method to monitor the effectiveness of eradication.

Y.V. Nikiforova: None. G.D. Fadieienko: None.

P02.39

METRONIDAZOLE SUSCEPTIBILITY TESTING FOR *HELICOBACTER PYLORI* ISOLATES: COMPARING AGAR DILUTION METHOD & EPSILOMETE TEST

X. TIAN*, Z. SONG, B. SUO, L. ZHOU, C. LI*
Peking University Third Hospital, Beijing, China.

Objective: This study was aimed at validating metronidazole susceptibility testing for *Helicobacter pylori* (*H. pylori*) isolates: comparing agar dilution and Epsilomete test (E-test).
Methods: From August 2018 to July 2020, patients with dyspepsia were examined by gastroscopy in our hospital. Two pieces of gastric mucosa were taken from patients with *H. pylori* infection. *H. pylori* culture was performed. The antimicrobial susceptibility of *H. pylori* to metronidazole was tested by E-test and agar dilution methods, and the consistency and correlation between the two methods were compared.
Results: 105 *H. pylori* strains were successfully cultured, 68 strains of metronidazole resistant strains were detected by agar dilution method (64.8%), 66 resistant strains were detected by E-test (62.9%). Sensitivity of E-test in the detection of metronidazole susceptibility was 97.1%, and specificity was 100%. Cohen's kappa coefficient is 0.959 (95% CI 0.902-1.016, p=0.000). Spearmans correlation detection was r=0.807 (p=0.000). In this study, the cost of E-test was lower than that of agar dilution method. The average cost of completing one case was 269.8 yuan *vs.* 356.6 yuan.
Conclusions: The susceptibility test of *H. pylori* to metronidazole by E-test is consistent with that by agar dilution. Because of its time-saving, labor-saving and low cost, it can be used as the optimal detection method of metronidazole sensitivity test.

X. Tian: None. Z. Song: None. B. Suo: None. L. Zhou: None. C. Li: None.

P02.40

COMPARISON OF THE SUCCESS RATE OF ERADICATION OF *HELICOBACTER PYLORI* BETWEEN HEMODIALYSIS PATIENTS AND NON-HEMODIALYSIS PATIENTS

S. KIM*, M. JOO, J. PARK, H. CHUN, S. LEE;*
Korea University College of Medicine, Seoul, Korea, Republic of.

Purpose: Currently, there is no clear knowledge of the effectiveness of the treatment of *Helicobacter pylori* (HP) infections in patients who undergo hemodialysis. This study will compare the success rate of HP eradication between hemodialysis patients and normal patients.
Methods: Patients were treated with HP eradication at Korea University's Guro Hospital between January 2018 and December 2018 and were evaluated for successful eradication treatment. Patients were randomly selected with a ratio of 1:2 between patients who underwent hemodialysis and patients that did not.

Results: 24 patients who underwent hemodialysis were treated with HP eradication and were evaluated for successful eradication treatment. Out of the 24 patients, 20 patients showed successful HP eradication in the first line treatment and the remaining 4 patients showed successful eradication in the second line treatment. 11 out of the 48 patients who did not undergo hemodialysis failed to show successful eradication in the first line treatment and received the second line treatment. 6 of the remaining 11 patients showed successful eradication in the second line treatment. There were no statistically significant differences between hemodialysis patients and normal patients.
Conclusion: The success rate of HP eradication in hemodialysis patients was not different from normal patients.

S. Kim: None. M. Joo: None. J. Park: None. H. Chun: None. S. Lee: None.

P02.41

HELICOBACTER PYLORI & PRIMARY ANTIBIOTIC RESISTANCE IN THE REGION OF NORTHEASTERN ROMANIA

E. V. POPOVICI[1,2], *M. INDREAS*[1], *C. MUZICA*[2,3], *A. TRIFAN*[2,3]
[1]County Clinical Emergency Hospital of Bacau, Romania, Bacau, Romania, [2]Grigore T Popa "University of Medicine and Pharmacy", Iasi, Romania, [3]Institute of Gastroenterology and Hepatology, "Sf. Spiridon" County Clinical Emergency Hospital, Iasi, Romania.

Introduction: *Helicobacter pylori* (*H. pylori*) infection is one of the most widespread in the world . Treatment of *H. pylori* infection is becoming increasingly difficult as antibiotic resistance develops in various regions of the globe.
Aim: We aimed to assess the antibiotic resistance of *H. pylori* strains isolated in the adult population from the Northeastern Region of Romania.
Material and method: 117 patients hospitalized in the Gastroenterology Department of Bacău County Emergency Hospital, between October 2019 and November 2020, identified with *H. pylori* infection by fecal antigen for *H. pylori* were included. All patients performed upper digestive endoscopy with 2 biopsies (from the gastric antrum and gastric body) in order to isolate *H. pylori* strains; 90 positive cultures were obtained, which were examined for susceptibility to antibiotics for amoxicillin (AMX), clarithromycin (CLR), metronidazole (MTZ), levofloxacin (LEV) and teracycline (TET). The diffusimetric method with E-tests according to the EUCAST guide was used.
Results: Antibiotic resistance of the *H. pylori* strains was recorded as follows: 72.2% for MTZ (65/90 patients), 30% for CLR (27/90 patients), 26.7% for AMX (24/90 patients). The highest resistance was observed in females, as follows: for MTZ (44/45 female patients,97.8%), for CLR (21/45 patients, 46.7%) and for AMX (18/45 patients, 40%). Antibiotic resistance was low for LEV (6/90 patients,6.7%), for RIF (7/90 patients,7.8%) and for TET (12/90 patients, 13.3%).
Conclusion: *H. pylori* strains isolated in patients with primary infection show increased resistance to MTZ, CLR and even AMX in the population of the Northeastern Region of Romania.

E.V. Popovici: None. M. Indreas: None. C. Muzica: None. A. Trifan: None.

ELECTRONIC POSTER ROUND 3

Gastric cancer

P03.01

PROTEOMIC SIGNATURES ASSOCIATED WITH PROGRESSION OF PRECANCEROUS GASTRIC LESIONS AND RISK OF EARLY GASTRIC CANCER

X. LI[1]*, J. QIN*[2]*, M. GERHARD*[3]*, K. PAN*[1]*, W. LI*[1]*;*
[1]Peking University Cancer Hospital, Beijing, China, [2]Beijing Proteome Research Center, Beijing, China, [3]Technical University of Munich, Munich, Germany.

Background: Molecular features underlining the multistage progression of gastric lesions and development of early gastric cancer (GC) are poorly understood. We portrayed the proteomic landscape and explored proteomic signatures associated with progression of gastric lesions and risk of early GC.
Methods: In-depth tissue proteomic profiling was conducted using liquid chromatography-tandem mass spectrometry involving a total of 324 subjects. The discovery cohort comprised 169 subjects, including 111 with gastric lesions and 58 with invasive GC. We then conducted a two-stage validation for key proteomic signatures, enrolling 155 subjects, including 108 with gastric lesions (39 of them were prospectively followed for 280 to 473 days), and 47 with early GC.
Results: There was a clear distinction in proteomic features for precancerous gastric lesions and GC. Four proteome-based molecular subtypes of gastric lesions were derived, revealing molecular heterogeneity beyond cellular morphology. We found 104 positively-associated and 113 inversely-associated proteins for risk of early GC. Of these, APOA1BP, PGC, HPX and DDT were further associated with the risk of gastric lesion progression. Integrating these proteomic signatures, the ability to predict progression of gastric lesions was significantly strengthened (areas under the curve=0.95 *vs.* 0.75, Delong's test p=0.04). Immunohistochemistry based on a subset of subjects and determination of mRNA expression levels validated the findings for these four proteins.
Conclusions: We defined proteomic signatures associated with progression of gastric lesions and risk of early GC, which may have translational significance for identifying a particular high-risk population and detecting GC at an early stage, improving potential for targeted GC prevention.

X. Li: None. J. Qin: None. M. Gerhard: None. K. Pan: None. W. Li: None.

P03.02

CURRENT SMOKING AND *H. PYLORI* STATUS IS ASSOCIATED WITH PRECANCEROUS LESIONS, MISSED" BY SEROLOGIC PEPSINOGEN TESTING

D. RAZUKA-EBELA[1]*, I. POLAKA*[1]*, I. DAUGULE*[2]*, I. EBELA*[2]*, J. YOUNG PARK*[3]*, M. LEJA*[1]
[1]Institute of Clinical and Preventive Medicine of the University of Latvia, Riga, Latvia, [2]Faculty of Medicine of the University of Latvia, Riga, Latvia, [3]International Agency for Research on Cancer, Lyon, France.

Introduction: We aimed to investigate factors associated with false negative (FN) serum pepsinogen (Pg) results in detecting gastric precancerous lesions.
Methods: Pg was measured and upper endoscopy with histology was performed for participants (aged 40-64) within the GISTAR study. Participants were classified as 'increased risk' if they had atrophy and/or intestinal metaplasia concurrent with increased gastric cancer risk (MAPS guideline) or dysplasia, with the rest as 'average risk'. 'Increased risk' histology not identified by serum PgI/PgII≤2 and PgI≤30 ng/mL was labeled FN and analyzed by smoking, *H. pylori* (HP, Giemsa), gender and age. ROC was calculated for PgI/II ratio, evaluated using AUC. The best cut-offs were chosen using Youden's J index (maximizing sensitivity and specificity).

Results: Of 1221 participants, 362 (29.6%) were 'increased risk', of which 157 (13.0%) were FN. FN were more likely to be current than former and never smokers (21.7% vs. 10.7%, $p<0.001$), men (17.5% vs. 9.7% women, $p<0.001$), and HP-positive (16.3% vs. 8.7% HP-negative, $p<0.001$). Using the pre-existing PgI/II cut-off, HP-negative current smokers had substantially lower sensitivity (table). New PgI/II cut-offs, sensitivity and specificity were calculated for current smokers: HP-negative 4.27ng/mL, 67.7%, 65.0%; HP-positive 2.37ng/mL; 65.3%, 72.5%.
Conclusions: Serum Pg accuracy was substantially lower in detecting precancerous lesions in current smokers, especially those HP-negative. Cutoffs optimized by ROC for this particular group may be considered to improve Pg yield.

D. Razuka-Ebela: None. I. Polaka: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Modest; Latvian Council of Science. I. Daugule: None. I. Ebela: None. J. Young Park: None. M. Leja: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Modest; Latvian Council of Science.

TABLE 1. SENSITIVITY (%, 95% CI), SPECIFICITY (%, 95% CI) AND AREA UNDER ROC CURVE FOR PRE-EXISTING PG CUT-OFF VALUES FOR THE 'INCREASED RISK' HISTOLOGY GROUP

	Pg I/Pg II ≤2	Pg I ≤30 ng/mL
All participants	56.27 (50.96-61.47);92.60 (90.63-94.26); 0.82	62.95 (57.73-67.96);81.43 (78.66-83.99); 0.75
Current smokers HP+	51.02 (36.34-65.58);86.24 (73.32-92.09); 0.75	32.65 (19.95-47.54);91.74 (84.90-96.15); 0.64
Current smokers HP-	32.36 (16.68-51.37);93.33 (83.80-98.15); 0.68	38.71 (21.85, 57.81);86.67 (75.41, 94.06); 0.68

P03.03

ESTROGEN AND *HELICOBACTER PYLORI* CAGA MAY INDUCE STEM CELL AND EPITHELIAL MESENCHYMAL TRANSITION PHENOTYPE IN DIFFUSE TYPE GASTRIC ADENOCARCINOMAS

S. KANG[1], *M. PARK*[2], *S. CHO*[1]
[1]Department of Internal Medicine and Liver Research Institute, Seoul National University College of Medicine, Seoul, Korea, Republic of, [2]Seoul National University Hospital, Seoul, Korea, Republic of.

Poor prognosis of diffuse-type gastric cancer (DGC) in young women may be related to female hormones such as estrogen. In addition, infection with *Helicobacter pylori* is thought to be a major cause of DGC as well as intestinal-type gastric cancer. We aimed to identify the carcinogenic mechanisms associated with the enrichment of cancer stem cells induced by estrogen and *H. pylori* in DGC. The estradiol (E2)-treated DGC cells showed increased cell viability, migration and invasion abilities, which were reversed by fulvestrant (ICI), an estrogen receptor antagonist. When E2 was added to DGC organoids, the size of organoids increased. E2-treated cells exhibited higher expression of N-cadherin, Snail, Vimentin, and stemness-associated proteins including Oct4, c-Myc, and Nanog compared to those treated with vehicle. When cells were treated with E2, the expression of an oncogenic long non-coding RNA, *HOTAIR* increased. Infected DGC cells with *H. pylori* increased the expression of MLL3 as a co-regulator of ER complex, and also increased both migration and invasion rates, which was not observed when infected with 60190Δ*CagA*. When cells were treated with both E2 and vectors expressing *CagA,* the expression of both EMT and stemness-related markers increased more than those treated with one among E2 or *H. pylori*. Treatment with estrogen in DGC cell lines may promote stem cell phenotype and epithelial-mesenchymal transition by the expression of *HOTAIR*, and this effect was enhanced by the addition of *H. pylori* infection.

S. Kang: None. M. Park: None. S. Cho: None.

P03.04

LEUKAEMIA INHIBITORY FACTOR SIGNALLING FOR TARGETING CANCER STEM CELLS IN GASTRIC ADENOCARCINOMA

L. SEENEEVASSEN[1], *J. GIRAUD*[1], *E. SIFRÉ*[1], *C. TIFFON*[1], *P. LEHOURS*[1,2], *O. MARTIN*[1], *P. DUBUS*[1,3], *C. VARON*[1]

[1]University of Bordeaux / INSERM / U1053 BaRITOn, Bordeaux, France, [2]Centre National de Référence des Helicobacters et Campylobacters, CHU Bordeaux, Bordeaux, France, [3]Department of Histology and Pathology, CHU Bordeaux, Bordeaux, France.

Cancer stem cells (CSCs) chemo-resistance mechanisms contribute to tumour maintenance and dissemination. Though rare, not all CSCs are involved in tumour metastasis. Some CSCs, Metastasis initiating cells (MICs), possess exacerbated epithelial-to-mesenchymal transition (EMT) and invasive characteristics facilitating tumour primary site evasion and metastasis initiation. Hippo pathway involvement in gastric tumorigenic and invasive properties has recently been established and Leukaemia Inhibitory Factor Receptor (LIFR) and its ligand LIF were found to inhibit gastric CSC tumorigenicity through Hippo kinases LATS1/2 activation. Since LIF impact on gastric MIC invasive properties has never been investigated, this study evaluated LIF effect on MIC invasive properties in GC cell lines and patient-derived xenograft (PDX) cells. RTqPCR and immunofluorescence were used to decipher LIF treatment effect on EMT markers expression as well as on invasive phenotype of GC cells. LIF effect on invasion capacity of GC cells and CSC were evaluated by using 2D and 3D-collagen invasion assays. XMU-MP-1 was used as Hippo kinase inhibitor to evaluate Hippo pathway participation to observed effects. LIF treatment decreased GC cell lines and PDX cells invasion capacity *in vitro*. In addition, decrease in EMT state, linked to the decrease in invasion was observed. LIF anti-invasive effect was reversed by Hippo kinase inhibition, highlighting the role of the Hippo pathway in LIF-dependent effects in GC cells.In conclusion, this study first displays Hippo kinases- dependent LIF anti-invasive properties in GC cells. LIF treatment could *in fine* constitute a new CSCs-targeting strategy to help decrease relapse cases and bad prognosis in GC.

L. Seeneevassen: None. J. Giraud: None. E. Sifré: None. C. Tiffon: None. P. Lehours: None. O. Martin: None. P. Dubus: None. C. Varon: None.

P03.05

DOES MICROBIAL LACTATE PLAY A ROLE IN GASTRIC ADENOCARCINOMA?

K. VINASCO-PACHECO, *H. MITCHELL, N. KAAKOUSH, N. CASTAÑO-RODRÍGUEZ*
University of New South Wales, Sydney, Australia.

Introduction: Lactic acid-producing bacteria (LAB) are enriched in gastric adenocarcinoma (GAC). Given that lactate is involved in several hallmarks of cancer, microbially-derived lactate could be a contributing factor in GAC.
Objective: We aimed to survey the gastric microbiota of GAC patients and functional dyspepsia (FD) controls. Given the reported enrichment of LAB in GAC, we investigated the expression levels of genes encoding the main host lactate transporters (*MCT1, MCT2*, and *MCT4*) and lactate receptor (*HCAR1*) in human gastric biopsies.
Methods: DNA and RNA were extracted from gastric biopsies from GAC and FD patients. The gastric microbiota was studied using 16S rRNA gene (DNA) and transcript (cDNA) amplicon sequencing of the V4 region with the Illumina MiSeq 2x250 bp chemistry. Stratified analyses by *Helicobacter pylori* status (*H. pylori*-negative [HP-] cluster (C) 0 and HP+ C1) were performed. Further, we evaluated the expression levels of *MCT1, MCT2, MCT4,* and *HCAR1* using qRT-PCR. The $2^{-\Delta\Delta Ct}$ and the fold-change were calculated.
Results: The relative abundance of *Lactobacillus* was significantly higher in GAC across all analyses (within HP- C0 and HP+ C1 as well as within DNA and cDNA). *MCT1, MCT2, MCT4,* and *HCAR1* were significantly downregulated in GAC patients.
Conclusions: *Lactobacillus* enrichment is an important dysbiotic signature in GAC that is not influenced by *H. pylori* status. Also, the significant downregulation of *MCTs* and *HCAR1* in the stomach of GAC patients might suggest an alteration of lactate transport in gastric carcinogenesis, possibly due to exacerbated levels of microbially-derived lactate in the tumor microenvironment.

K. Vinasco-Pacheco: None. N. Castaño-Rodríguez: None. N. Kaakoush: None. H. Mitchell: None.

P03.06

REPROGRAMING OF GASTRIC EPITHELIAL CELLS TOWARDS PRECANCEROGENIC AND PROINVASIVE PHENOTYPE BY SECRETOME OF *HELICOBACTER PYLORI*-ACTIVATED FIBROBLASTS

G. KRZYSIEK-MACZKA[1], A. TARGOSZ[1], M. STRZALKA[1], U. SZCZYRK[1], T. WROBEL[2], J. OPILA[3], J. CZYZ[2], A. PTAK-BELOWSKA[1], ***T. BRZOZOWSKI***[1]

[1]Department of Physiology, Faculty of Medicine, Jagiellonian University Medical College, Cracow, Poland, [2]Department of Cell Biology, Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Cracow, Poland, Cracow, Poland, [3]Department of Applied Computer Sciences, Faculty of Management, AGH University of Science and Technology, Cracow, Poland, Cracow, Poland.

Despite improvements in gastric cancer (GC) therapy, patients continue to suffer from cancer relapses and metastases. Both pathologies have also been linked to the relationship between asymptomatic *Helicobacter pylori* (*Hp*) infections and cancer incidence.The limited efficiency of GC treatment strategies can depend upon the activity of tumor stroma with the key role of cancer-associated fibroblasts (CAFs) known to create the tumor microenvironment and enhancing metastatic cascade. We investigated the effect of long-term eposure of normal gastric epithelial cells to *Hp*activated gastric fibroblasts (*Hp*-AGF) secretome or non-infected normal gastric fibroblasts secretome (GF). The invasive properties of cells were checked by microscopy and time-lapse video microscopy in Geltrex basement membrane (BM) assays. The expression of invasion-related factors was checked by RTPCR, Western Blot, immunofluorescence and Elisa. We have shown that the long-term incubation of RGM1 cells in the presence of *Hp*-activated gastric fibroblast (*Hp*-AGF) secretome induced increased motility, actin cytoskeletal plasticity and shift towards overall $Snail^{+}$/$Twist^{+}$/Cytokeratin19^{+}/FAP^{+}//$MMPs^{high}$/$cMet^{high}$/$pEGFR^{high}$/β1-$Integrin^{high}$/TNC+ motile and invasive phenotype combined with ability to migrate through and destroy artificial BM. We conclude that long-term influence of *Hp*-infected fibroblast secretome induces reprogramming of epithelial cells towards cancerogenic and invasive phenotype which can be extrapolated to EMT type 3 and thus may contribute to cancer initiation and progression. We propose that this microevolution involves the HGF-Integrin-Ras-dependent Twist activation leading to MMP and TNC upregulation resulting in subsequent EGFR activation. We also postulate that long-term influence of *Hp*AGF secretome induces phenotypical plasticity of epithelial cells likely switching from cancerous to CAF phenotype.

G. Krzysiek-Maczka: None. A. Targosz: None. M. Strzalka: None. U. Szczyrk: None. T. Wrobel: None. J. Opila: None. J. Czyz: None. A. Ptak-Belowska: None. T. Brzozowski: None.

P03.07

PUTATIVE IMPACT OF CAGA PROTEIN ON DNA DAMAGE REPAIR MACHINERY DURING *HELICOBACTER PYLORI* INFECTION

E. KONTIZAS[1,2], *S. TASTSOGLOU[3], T. KARAMITROS[1], Y. KARAYIANNIS[1,2], P. KOLLIA[2], A. HATZIGEORGIOU[3], D. N. SGOURAS[1]*

[1]Laboratory of Medical Microbiology, Department of Microbiology, Hellenic Pasteur Institute, Athens, Greece, [2]Department of Genetics and Biotechnology, Faculty of Biology, School of Science, National and Kapodistrian University of Athens, Athens, Greece, [3]Laboratory of Bioinformatics, Hellenic Pasteur Institute, Athens, Greece.

Helicobacter pylori (*Hp*) infection induces inflammation and a plethora of DNA damages including strand-breaks, microsatellite instability, epigenetic alterations and base mutations. Gastric epithelial cells, in order to maintain genomic integrity, require an integrous DNA damage repair (DDR) machinery which, however, has been reported to be modulated by the infection. CagA is a major *Hp* virulence factor that deregulates numerous host cell functions such as proliferation and

apoptosis. Its pathogenic activity is partly regulated by tyrosine phosphorylation on repeated EPIYA-motifs. Our aim was to identify putative effects of *Hp* infection and CagA on DDR, investigating the transcriptome of AGS cells, infected with wild-type, *Δ*CagA and EPIYA-phosphorylation-defective strains. Upon RNA-Sequencing on polyA-selected transcripts we performed Differential Expression Analysis, Pathway Analysis and visualization on KEGG Pathway Maps per DDR mechanism. Key DDR components that were observed to be deregulated were validated via Western Blot utilizing AGS and GES1 cells. Transcriptome analysis revealed that a notable number of DDR genes were downregulated during *Hp* infection resulting to potential attenuation of Base Excision Repair and Mismatch Repair and a more intricate deregulation of Nucleotide Excision Repair and Homologous Recombination. CagA was observed to contribute to *NTHL1*, *MUTYH*, *FEN1*, *APE1*, *POLD1*, *LIG1* and *RAD51* downregulation which was verified on the protein expression level. Contrary to transcriptome data, APE1 protein levels were observed increased. Our study suggested that CagA can act as a significant contributor of the *Hp* infection-mediated DDR modulation, potentially disrupting the balance between DNA damage introduction and repair thus favoring genomic instability and carcinogenesis.

E. Kontizas: None. S. Tastsoglou: None. T. Karamitros: None. Y. Karayiannis: None. P. Kollia: None. A. Hatzigeorgiou: None.

P03.08

EX-VIVO PROFILING OF VOLATILE ORGANIC COMPOUNDS RELEASED FROM GASTRIC CANCER AND NON-CANCEROUS TISSUE

D. SLEFARSKA[1,2], *L. MEZMALE*[3], *I. KIKUSTE*[3,4], *M. LEJA*[3,4,5], *P. MOCHALSKI*[1,2]
[1]Institute of Chemistry, Jan Kochanowski University, Kielce, Poland, [2]Breath Research Institute of the University of Innsbruck, Dornbirn, Austria, [3]Institute of Clinical and Preventive Medicine & Faculty of Medicine, University of Latvia, Riga, Latvia, [4]Digestive Diseases Centre GASTRO, Riga, Latvia, [5]Riga East University Hospital, Riga, Latvia.

Introduction: The human body releases numerous volatile organic compounds (VOCs) through tissues and various body fluids. These compounds form a specific chemical profile that may be used to detect the gastric cancer-related changes in human metabolism and thereby, to diagnose this type of cancer at an early stage. More specifically, the information provided by this profile can be helpful in distinguishing between gastric cancer and non-cancerous tissues and identification of potential volatile makers of this disease.
Aim: The main goal of this study was to identify VOCs derived from gastric cancer and non-cancerous tissues and perform preliminary descriptive analysis.
Methods: Volatiles released by the tissue samples were captured using solid phase microextraction (SPME). VOCs analysis was performed using gas chromatography with mass spectrometric detection (GC-MS).
Results: In total 44 patients were analyzed. More than 60 compounds were identified, including hydrocarbons, aromatics, aldehydes, ketones, heterocyclics and esters. Identification of compounds was obtained in two steps. Amongst the identified compounds there were, e.g., isoprene, 2-butanone, n-hexane, ethyl acetate, benzene, pyrrole, p-xylene, benzonitrile, *D*-limonene and *γ*-butyrolactione.
Conclusions: The aim of this study was to identify VOCs released by gastric cancer and non-cancerous tissues. Headspace analysis of tissues, involving GC-MS combined with SPME resulted in the identification of 62 VOCs. The results of the study suggest that volatile organic compounds emitted by cancerous tissue form the cancer-specific chemical fingerprints of this cancer. Further analyzes are needed to verify possible markers of gastric cancer and gain better insight into their origin in the human body.

D. Slefarska: None. L. Mezmale: None. I. Kikuste: None. M. Leja: None. P. Mochalski: None.

P03.09

THE ROLE OF THE NONSPECIFIC IMMUNITY IN THE PROGRESSION OF GASTRIC CANCER ASSOCIATED WITH *HELICOBACTER PYLORI* INFECTION

***O. SMIRNOVA**, A. SINYAKOV*
Federal Research Center "Krasnoyarsk Scientific Center of the Siberian Branch of the Russian Academy, Krasnoyarsk, Russian Federation.

The aim of the study was to evaluate the chemiluminescent activity of neutrophilic granulocytes and monocytes in patients with gastric cancer with *H. pylori* infection.
Methods: 50 patients with gastric cancer with *Helicobacter pylori* infection were examined. The control group consisted of 50 healthy individuals. As a method for studying the activity of neutrophilic granulocytes and monocytes, we used a chemiluminescent analysis of spontaneous and induced production of reactive oxygen species neutrophilic granulocytes and monocytes in patients with gastric cancer.
Results: In patients with gastric cancer with spontaneous and induced chemiluminescence of neutrophilic granulocytes and monocytes there was an increase in the time to reach the maximum with spontaneous and induced chemiluminescence compared to the control group. In addition, in patients with gastric cancer with spontaneous and induced chemiluminescence of neutrophilic granulocytes and monocytes there was a decrease in the area under the glow curve compared to the control group.
Conclusions: Patients with gastric cancer with *Helicobacter pylori* infection have been found to have a depletion of metabolic reserves and a decrease in antitumor effects, as well as a decrease in the response rate of NG in this disease. In patients with gastric cancer associated with *Helicobacter pylori*- infection, a decrease in monocyte activity is detected due to the duration of the disease and the toxic effects of the tumor products. The inefficiency of phagocytosis of monocytes leads to the spread of the tumor.

O. Smirnova: None. A. Sinyakov: None.

P03.10

ROLE OF CLAUDIN PROTEINS FOR PREDICTION OF LYMPHATIC OR LYMPH NODE INVASION AMONG SUBMUCOSAL-INVASIVE EARLY GASTRIC CANCER

***M. JOO**[1], J. PARK[1], B. LEE[1], S. KIM[1], W. KIM[1], J. BANG[1], H. CHUN[2], S. LEE[3]*
[1]Korea University Guro Hospital, Korea University College of Medicine, Seoul, Korea, Republic of, [2]Korea University Anam Hospital, Korea University College of Medicine, Seoul, Korea, Republic of, [3]Korea University Ansan Hospital, Korea University College of Medicine, Seoul, Korea, Republic of.

Purpose: Claudin (CLDN) is a tight junction protein found in human epithelial cells, and the expression of CLDN-3, 4 is known to increase, but that of CLDN-8 to decrease with progression of gastric cancer. In this study, we investigate the different expression of CLDN-3, 4, and 8 in submucosal (SM)-invasive early gastric cancer (EGC) according to lymphatic vessel (LV) or lymph node (LN) invasion.
Methods: We enrolled 44 patients who underwent surgical gastric resection and confirmed as EGC with submucosal invasion from January 2007 to December 2018. To assess the prevalence of epithelial tight junctions, we performed immunohistochemical staining for CLDN-3, 4 and 8. The stain intensity of the tumor cells was graded either weak, moderate or strong, and the proportions in each intensity grade were used to evaluate immunoreactivity: If more than 50% of the cells were stained with moderate to strong intensity, the immunoreactivity was classified as high, or as low otherwise.
Results: Among 44 patients, 26 patients (59.1%) had LV invasion, and 19 (43.2%) had LN invasion. Among 18 patients without LV invasion, 1 patient (5.6%) had high CLDN-3 expression, while in 26 cases of LV invasion, 9 patients (34.6%) had high CLDN-3 expression (p=0.025). Among patients without LN invasion, 5 of 25 patients (20.0%) had high CLDN-8 expression, while none of 19 patients (0.0%) with LN invasion had high CLDN-8 expression (p=0.049).
Conclusion: Upregulation of CLDN-3 and downregulation of CLDN-8 may be useful markers for prediction of LV or LN invasion among SM-invasive EGC.

M. Joo: None. J. Park: None. B. Lee: None. S. Kim: None. W. Kim: None. J. Bang: None. H. Chun: None. S. Lee: None.

P03.11

REASONS FOR REFUSING FURTHER ENDOSCOPIC SURVEILLANCE IN PATIENTS WITH DIAGNOSED PRECANCEROUS GASTRIC LESIONS

L. R. ROTBERGA[1,2], *M. LEJA*[1,2,3], *I. KIKUSTE*[1,2,3], *I. POLAKA*[2], *J. Y. PARK*[4]
[1]University of Latvia, Faculty of Medicine, Riga, Latvia, [2]Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia, [3]Digestive Diseases Centre GASTRO, Riga, Latvia, [4]International Agency for Research on Cancer, Lyon, France.

Background: Endoscopic surveillance of patients with precancerous lesions is crucial for timely identification of an early-stage cancer. The European (MAPS) guidelines are defining the groups of subjects to be subjected to surveillance as well as the intervals of control.
Aim: To evaluate the proportion of patients refusing to undergo surveillance endoscopy, and the reasons for refusing surveillance.
Methods: Altogether, 233 GISTAR study subjects in whom surveillance endoscopy was indicated according to the MAPS guidelines, were invited for upper endoscopy by a telephone call. Reasons for refusing the follow up endoscopy were categorized into 5 categories.
Results: 65 out of 233 patients refused surveillance investigation after the initial upper endoscopy, of those 35 in the very high-risk group (dysplasia), 5 in the high-risk group (OLGA or OLGIM stage III-IV), and 25 in the medium high-risk group (intestinal atrophy and metaplasia). The most common reason for refusing surveillance upper gastroscopy was “just did not want it” - 28, followed by “other”, which included reasons like health and transportation issues. The third most common reason was “financial problems” - 8, followed by “find in unnecessary” - 6, and the least common reason category - “lack of time”, concluding 4 patients.
Conclusion: Approximately half of the patients, who refused endoscopic surveillance, were in a group with the highest risk of developing gastric cancer. Feeling healthy, lack of belief in surveillance procedures being among the main reasons for not being compliant are indicating the need for improved health literacy among the general population.

L.R. Rotberga: None. M. Leja: None. I. Kikuste: None. I. Polaka: None. J.Y. Park: None.

P03.12

PERIODONTAL DISEASE, GINGIVITIS, PERIODONTITIS, TOOTH LOSS & GASTRIC ADENOCARCINOMA: SYSTEMATIC REVIEW

F. J. AGUIAR[1], *G. A. FERNANDES*[1], *M. A. FAGUNDES*[1], *F. S. MENEZES*[2,3], *M. P. CURADO*[1]
[1]ACCAMARGO, São Paulo, Brazil, [2]Department of Health Education - Federal University of Sergipe, Aracaju, Brazil, [3]University of São Paulo, São Paulo, Brazil.

Objective: To assess the association between periodontal disease, gingivitis, periodontitis, tooth loss, gastric adenocarcinoma.
Methods: This systematic review investigated observational studies published in all available languages from 1961 until March 2021, on PubMed, Embase, Web of Science, Scopus, Lilacs and Opengrey databases. Case-control and cohort studies were included and cross-sectional studies, systematic reviews, case reports, literature reviews, ecological studies, experimental studies, and animal studies were excluded. Rayyan software was used to screen studies and exclude duplicates. According to PICO, two researchers (FJNA and MAF) reviewed the titles and abstracts of the studies retrieved following the eligibility criteria. Also, the references of the selected articles were revised to include relevant studies.
Results: In total, 12 cohort studies and four case-control studies were identified between 1998 and 2020. These articles were carried out in Japan (n= 2), China (n= 3), Taiwan (n= 3), the USA (n= 4), Finland (n= 1), Sweden (n= 2), and Iran (n= 1).

Conclusion: Despite the apparent biological plausibility between periodontal disease, gingivitis, periodontitis, tooth loss and gastric cancer, there are few epidemiological studies on this association and the results are conflicting. In none of the four case-control studies was there an association between periodontal disease, gingivitis, periodontitis, tooth loss and gastric adenocarcinoma, whereas in the cohort studies it was observed that in half of them there was an association between exposure and outcome, and in the other half there was no association.

F.J. Aguiar: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Modest; CAPES. G.A. Fernandes: None. M.A. Fagundes: None. F.S. Menezes: None. M.P. Curado: None.

P03.13

FINDINGS FROM THE SURVEILLANCE UPPER ENDOSCOPIES IN PATIENTS WITH GASTRIC MUCOSAL DYSPLASIA AT THE BASELINE

L. R. ROTBERGA[1,2], *M. LEJA*[1,2,3], *S. ISAJEVS*[1,2,4], *I. TOLMANIS*[2,3], *M. B. PIAZUELO*[5]
[1]Faculty of Medicine, University of Latvia, Riga, Latvia, [2]Institute of Clinical and Preventive Medicine, University of Latvia, Riga, Latvia, [3]Digestive Diseases Centre GASTRO, Riga, Latvia, [4]Academic Histology laboratory, Riga, Latvia, [5]Division of Gastroenterology, Department of Medicine, Vanderbilt University School of Medicine, Nashville, TN, United States.

Background: Regular surveillance of patients with gastric precancerous lesions, in particular, those with dysplasia, is essential for timely recognition of progression of the lesion towards gastric cancer.
Aim: To evaluate findings of the surveillance upper gastrointestinal (GI) tract endoscopy in patients from the GISTAR cohort having been diagnosed dysplasia at the baseline endoscopy.
Methods: Upper endoscopies were performed according to the GISTAR study protocol, obtaining 5 non-targeted biopsies plus targeted biopsies if necessary. Indications and timing of the surveillance were applied according to the MAPS, i.e., subjects at baseline being diagnosed with dysplasia were included to the evaluation.
Results: Out of 98 subjects results of the surveillance endoscopy were available from 60. Of those, 28 had low-grade dysplasia, 32 were diagnosed as indefinite for dysplasia, but none were diagnosed high-grade dysplasia at baseline. *H. pylori* infection was detected at the baseline endoscopy in 45 subjects (75%), and eradication therapy was completed in 36 of them. One patient developed gastric cancer during surveillance (Stage 0; $TisN_0M_0$) In six patients, dysplasia progressed to a higher grade. In three subjects, dysplasia remained in the same grade. Altogether, 50 study subjects were not found to have dysplasia at the follow-up endoscopy; 28 of those have had received eradication following the baseline endoscopy.
Conclusion: Endoscopic surveillance of patients with gastric dysplasia is important to identify those progressing to more advanced lesions, even though a significant proportion of subjects may be found without dysplastic lesions during the surveillance, in particular after having undergone *H. pylori* eradication.

L.R. Rotberga: None. M. Leja: None. S. Isajevs: None. I. Tolmanis: None. M.B. Piazuelo: None.

P03.14

CHANGES IN LIPID PEROXIDATION AND ANTIOXIDANT PROTECTION IN CHRONIC ATROPHIC GASTRITIS AND GASTRIC CANCER ASSOCIATED WITH *HELICOBACTER PYLORI* INFECTION

O. SMIRNOVA*, A. SINYAKOV*
Federal Research Center "Krasnoyarsk Scientific Center of the Siberian Branch of the Russian Academy, Krasnoyarsk, Russian Federation.

Objective: to evaluate the content of malondialdehyde and the activity of antioxidant enzymes (superoxide dismutase and catalase) in chronic atrophic gastritis and gastric cancer associated with *Helicobacter pylori*- infection.

Methods: 25 patients with chronic atrophic gastritis, 50 patients with gastric cancer and 50 practically healthy volunteers were examined. The content of malondialdehyde, the activity of superoxide dismutase and catalase were determined in the blood serum by spectrophotometric methods.
Results: In patients with chronic atrophic gastritis in the blood serum, an increase in the content of malondialdehyde relative to the control group was revealed, which indicates an increase in lipid peroxidation in these patients. In patients with chronic atrophic gastritis, the activity of both enzymes: superoxide dismutase and catalase increased. In patients with gastric cancer, showed 50-fold increase in the content of malondialdehyde relative to the control group, indicating significant oxidative stress in patients. However, there was a decrease in the activity of superoxide dismutase and an increase in catalase activity in patients with gastric cancer relative to the control group.
Conclusion: Patients with gastric cancer associated with *Helicobacter pylori*- infection exhibit severe oxidative stress. An imbalance is detected in the bifunctional system of superoxide dismutase - catalase, the activity of the main enzyme of the antioxidant defense superoxide dismutase is reduced, while the high activity of catalase indicates massive cell decay in gastric cancer, and it can be assumed that in conditions of high catalase activity, cells lining blood vessels are subject to significant oxidative stress.

O. Smirnova: None. A. Sinyakov: None.

P03.15

EVALUATION OF THE GLUTATHIONE PART OF ANTIOXIDANT PROTECTION IN THE DEVELOPMENT OF ATROPHY IN CHRONIC GASTRITIS AND GASTRIC CANCER ASSOCIATED WITH *HELICOBACTER PYLORI* INFECTION

O. SMIRNOVA*, A. SINYAKOV*
Federal Research Center "Krasnoyarsk Scientific Center of the Siberian Branch of the Russian Academy, Krasnoyarsk, Russian Federation.

Objective: to evaluate the content of malondialdehyde and components of the glutathione antioxidant defense component in chronic atrophic gastritis and gastric cancer associated with *Helicobacter pylori* infection.
Methods: 40 patients with gastric cancer, 25 patients with chronic atrophic gastritis, and 50 practically healthy volunteers were examined. The content of malondialdehyde, reduced glutathione, the activity of glutathione-S-transferase and glutathione peroxidase were determined in the blood serum by spectrophotometric methods. Statistical data processing was carried out using Statistica.
Results: The content of malondialdehyde increased 5 times in patients with chronic atrophic gastritis relative to control group. In patients with chronic atrophic gastritis, the activity of both enzymes increased, while the content of reduced glutathione did not statistically significantly differ from the control group. In patients with gastric cancer there was an increase in the concentration of malondialdehyde in plasma compared with the control group. The concentration of glutathione-S transferase and glutathione peroxidase in plasma in patients with cancer increased compared with the control group. The level of restored glutathione in patients with gastric cancer was significantly higher than in all other studied groups.
Conclusion: In patients with chronic atrophic gastritis, pathogenetic changes are caused not only by inflammation, but also by a histodestructive process in the gastric mucosa, which leads to a more pronounced oxidative stress. In patients with gastric cancer, lipid peroxidation processes are enhanced, proven by an increase in serum malondialdehyde.

O. Smirnova: None. A. Sinyakov: None.

P03.16

POLYPHENOLS INTAKE AND GASTRIC CANCER: A QUICK REVIEW THAT PRECEDES A CASE-CONTROL STUDY IN THE AMAZON REGION OF BRAZIL

***M. FAGUNDES**, G. FERNANDES, M. CURADO*
AC Camargo Cancer Center, São Paulo, Brazil.

Background: Phenolic compounds can have a protective effect on the risk of several types of cancer, including gastric cancer (GC). However, the investigation of classes and subclasses of polyphenols has not been widely carried out in relation to CG in Brazil. The aim of this quick review was to describe the association of polyphenol intake and GC.
Methods: Observational studies as cohort and case-control published in all languages available until March 2021 in PubMed were investigated. PICO was considered for the inclusion and exclusion of the evaluated abstracts and titles. Rayyan software was used to screen studies and exclude duplicates.
Results: Of the 166 articles found, 12 were selected for descriptive analysis. It was observed that 50% of the studies were published between 1999 - 2010, 3 studies published in the last 5 years, and only 1 in a country of Latin America (Mexico). Seven are case-control studies, 1 compiled from 10 case-control studies and 4 are prospective cohorts. Flavonoids were the most studied class, and only 2 studies evaluated the total of polyphenols intake. Cohort studies showed no association, whereas all case-control studies showed that some classes of polyphenol intake were inversely associated with the risk of GC.
Conclusions: The inverse association between polyphenol intake and GC can be better observed in case-control studies. A case-control study in the Amazon region of Brazil can be the pioneer in evaluating this association in South America, as well as bringing important contributions to the scientific literature on the topic.

M. Fagundes: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Modest; Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq). G. Fernandes: None. M. Curado: None.

ELECTRONIC POSTER ROUND 4

Helicobacter infection - pathogenesis and host response

P04.01

HELICOBACTER PYLORI UPREGULATE EPITHELIAL CORTACTIN EXPRESSION IN A CAGA- AND JNK-DEPENDENT MANNER

*I. SHARAFUTDINOV, N. TEGTMEYER, **S. BACKERT***
Friedrich-Alexander University Erlangen-Nuremberg, Erlangen, Germany.

Helicobacter pylori is a microbial pathogen, which can lead to various gastric disorders ranging from gastritis to gastric cancer. During infection, *H. pylori* disturbs various host signaling pathways, one of which may result in activation of the actin-binding protein cortactin. Cortactin is a major regulatory factor involved in the regulation of cellular cytoskeleton organization and cell movement. Moreover, cortactin has been repeatedly shown to be amplified and overexpressed in various human cancers. Here we show that *H. pylori* can induce overexpression of cortactin in gastric AGS and intestinal Caco-2 epithelial cell lines.
Cortactin protein amounts increased by 2-3-fold after 24-48 hours infection, as shown by Western blotting and immunofluorescence microscopy. Using a set of CagA-positive and CagA-negative strains as well as various isogenic mutants of *H. pylori*, we demonstrate that cortactin overexpression depends on the type IV secretion system (T4SS), and in particular on the translocation of the major bacterial

virulence factor CagA. Transfection experiments revealed that ectopic expression of CagA in AGS cells is sufficient to induce overexpression of cortactin. Interestingly, tyrosine phosphorylation of CagA was not required for this process since phospho-deficient CagA was capable of increasing cortactin expression. Finally, by using various kinase inhibitors, we found that the mitogen-activated protein kinase JNK (c-Jun N-terminal kinase) is essential for the pathway leading to cortactin overexpression. Therefore, we discovered a new CagA/JNK pathway inducing cortactin overexpression upon *H. pylori* infection, which in turn might contribute to the development of gastric disorders, including gastric cancer.

S. Backert: None. I. Sharafutdinov: None. N. Tegtmeyer: None.

P04.02

HELICOBACTER PYLORI PQQE PROTEASE CLEAVES JUNCTIONAL ADHESION MOLECULE A TO DISRUPT TIGHT JUNCTION FUNCTIONS

M. S. MARQUES[1,2,3], A. C. COSTA[1,2,3], H. OSÓRIO[1,2,3], M. L. PINTO[1,2], S. RELVAS[4], M. DINIS-RIBEIRO[3,5,6], F. CARNEIRO[1,3,4], M. LEITE[1,2,3], ***C. FIGUEIREDO***[1,2,3]

[1]IPATIMUP - Institute of Molecular Pathology and Immunology of the University of Porto, Porto, Portugal, [2]i3S - Instituto de Investigação e Inovação em Saúde, Universidade do Porto, Porto, Portugal, [3]Faculty of Medicine of the University of Porto, Porto, Portugal, [4]Centro Hospitalar Universitário S. João, Porto, Portugal, [5]Instituto Português de Oncologia, Porto, Portugal, [6]Center for Health Technology and Services Research, Porto, Portugal.

Background & Aims: *Helicobacter pylori* is a persistent gastric colonizer able to alter the structure and functions of intercellular junctions. We investigated the relationship between *H. pylori* and epithelial JAM-A to reveal a novel virulence factor implicated in tight junction dysfunction.
Methods: The impact of *H. pylori* on JAM-A expression was determined in gastric cell lines, in primary gastric cells, and in gastric biopsy specimens of patients. *H. pylori*-mediated JAM-A cleavage was confirmed by mass spectrometry, and the cleavage site was determined by MALDI MS. Cells stably transfected with full-length JAM-A or JAM-A lacking the cleaved sequence were used in transepithelial electrical resistance, slow aggregation, and cell invasion assays to evaluate the functional consequences of *H. pylori*-mediated cleavage. Chromatographic techniques, MALDI-TOF/TOF, and peptide mass fingerprinting were used to purify and identify the *H. pylori* virulence factor that cleaves JAM-A. Validation of JAM-A cleavage was performed with recombinant wild-type and catalytic domain mutant proteases.
Results: We show that *H. pylori* disrupts JAM-A *in vitro* in gastric cell line models, in primary cells, and *in vivo* in the gastric mucosa of infected patients. *H. pylori* cleaves the cytoplasmic domain of JAM-A and this affects the epithelial barrier function and cell-cell adhesion. Finally, we identify PqqE (HP1012) as the *H. pylori* protease that cleaves JAM-A, uncovering an unreported function for this bacterial metalloprotease.
Conclusions: Our findings reveal a unique strategy that *H. pylori* uses to disrupt the structure and functions of tight junctions, which may contribute to bacterial pathogenesis.

C. Figueiredo: None. M.S. Marques: None. A.C. Costa: None. H. Osório: None. M.L. Pinto: None. S. Relvas: None. M. Dinis-Ribeiro: None. F. Carneiro: None. M. Leite: None.

P04.03

EFFECT OF *HELICOBACTER PYLORI* ERADICATION ON THE RECURRENCE OF GASTRIC CANCER AFTER ENDOSCOPIC SUBMUCOSAL DISSECTION

J. PARK[1], *B. LEE[1], M. JOO[1], S. KIM[1], H. CHUN[2], S. LEE[3]*

[1]Korea University Guro Hospital, Seoul, Korea, Republic of, [2]Korea University Anam Hospital, Seoul, Korea, Republic of, [3]Korea University Ansan Hospital, Seoul, Korea, Republic of.

Objective: This study aimed to investigate the effect of *H. pylori* eradication on gastric cancer recurrence after endoscopic submucosal dissection (ESD).

Methods: We retrospectively analyzed 640 EGC patients who underwent ESD from December 2005 to Jun 2017 in Korea University Guro Hospital. Patients were categorized according to pathologic result of endoscopic submucosal dissection (curative resection, non-curative resection) and status of *H. pylori* infection. The primary endpoint was gastric cancer recur according to *H. pylori* status.
Results: Total 65 patients recurred gastric cancer during follow-up period. Gastric cancer recurred in 22 patients of the *H. pylori*-eradicated group (19 patients (8.2%) in the curative resection group, 3 patients (15.7%) in the non-curative resection group) and 13 patients of the *H. pylori*-persistent group (10 patients (17.2%) in the curative resection group, 3 patients (37.5%) in the non-curative resection group).
Conclusion: Successful *H. pylori* eradication may decrease gastric cancer recur after ESD for EGC. In particular the case of non-curative resection group, *H. pylori* eradication may be effective in improving the patient's prognosis.

J. Park: None. B. Lee: None. M. Joo: None. S. Kim: None. H. Chun: None. S. Lee: None.

P04.04

COMPREHENSIVE INTEGRATION OF GENOME-WIDE ASSOCIATION AND GENE EXPRESSION STUDIES REVEALS NOVEL GENE SIGNATURES FOR HELICOBACTER-INDUCED GASTRIC DISEASE AND POTENTIAL THERAPEUTIC TARGETS

M. BADR[1], *M. OMAR*[2], *G. HÄCKER*[1];
[1]Institute of Medical Microbiology and Hygiene, Freiburg, Germany, [2]Department of Pathology and Laboratory Medicine, New York, NY, United States.

Study goals: *Helicobacter pylori* is a gram negative bacterium that frequently colonizes the mucus layer of human stomach, where some bacteria will attach to the gastric epithelial cells triggering an immune response recruiting neutrophils and macrophages, which may lead to gastritis. This inflammatory environment can in some cases advance to peptic ulcers and gastric cancer. Here we harness in silico analysis models of published gastric biopsies gene expression data for *H. pylori* infected patients in different disease stages to identify novel markers for disease development, relevant signaling pathways, and potential targets for therapy.
Results: This analysis revealed a core signature of 55 differentially expressed genes that were shared between patients at different stages of the pathology, with TLR8, CASP1, and TNFRSF10B among the most significantly upregulated genes. Pathway enrichment analysis revealed cytokine-mediated signaling pathway, interferon-gamma-mediated signaling pathway, and Mineral absorption among the most strongly associated common pathways. Dihomo-gamma-linolenic acid was one of agents inducing the highest reverse signature in our connectivity map analysis.
Conclusions: Our study shows that the approach of a meta-analysis increases sensitivity and permits the identification of candidate genes and mechanisms that may play a role in the pathogenesis of *H. pylori* and tumorigenesis. Novel targets and therapeutic candidates were identified that may provide a basis for future functional and epidemiological studies. Our observations provide valuable data about the underlying biology of the host response to *H. pylori* and shed light to importance of early screening in various other diseases as metabolic syndrome.

M. Badr: None. M. Omar: None. G. Häcker: None.

P04.05

INHIBITION OF POLYCOMB REPRESSIVE COMPLEX 2 EXPRESSION AND FUNCTION BY *HELICOBACTER PYLORI*

R. FITZGERALD*, M. DEVAPAL, V. SAINI, J. HICKEY, D. MCNAMARA, S. M. SMITH*
Trinity College Dublin, Dublin, Ireland.

Introduction: The Polycomb repressive complex 2 (PRC2) trimethylates histone H3 on lysine 27 (H3K27me3) triggering gene silencing. Altered expression of PRC2 components is associated with disease and carcinogenesis.
Aim: To investigate expression and function of PRC2 during *H. pylori* infection.

Methods: qPCR was performed to monitor *H. pylori*-mediated expression changes in PRC2 component genes *Ezh2*, *Eed* and *Suz12* in MKN45 and AGS gastric epithelial cells, THP-1 macrophages and stomach biopsies from *H. pylori*-infected and uninfected patients. Accumulation of RNA polymerase II (PolII) and H3K27me3 at gene loci was measured by chromatin immunoprecipitation (ChIP)-qPCR. The Student's T-test and Mann-Whitney U-test were calculated on cell culture and tissue results, respectively. P value of <0.05 was significant.
Results: *H. pylori* decreased expression of *Ezh2*, *Eed* and *Suz12* in AGS and MKN45 cells. *Eed* expression was significantly reduced in *H. pylori*-infected and *H. pylori* LPS-treated THP-1 macrophages. A significant decrease (41%) in median *Eed* expression was observed in the gastric mucosa of *H. pylori*-infected (N=21) versus uninfected (N=9) patients (p=0.03). Consistent with their functional role in gene silencing, decreased expression of PRC2 components was associated with decreased accumulation of H3K27me3 and increased PolII at the transcriptional start site (TSS) of the gene encoding the pro-inflammatory cytokine Interleukin-8.
Conclusion: *H. pylori* inhibits expression of PRC2 components in gastric epithelial cells, macrophages and gastric mucosa. Additionally, *H. pylori* reduces levels of the repressive histone mark H3K27me3 at the *Il8* gene TSS. Further studies are required to identify H3K27me3 targets and their role in *H. pylori*-associated pathogenesis.

R. FitzGerald: None. M. Devapal: None. V. Saini: None. J. Hickey: None. D. McNamara: None. S.M. Smith: None.

P04.06

HELICOBACTER PYLORI INFECTION PROVIDES PROANGIOGENIC CONDITIONS IN AN EXPERIMENTAL MODEL OF VASCULAR ENDOTHELIAL CELLS

P. RUSEK-WALA[1,2], *A. KRUPA*[1], *W. GONCIARZ*[1], *M. CHMIELA*[1]
[1]Department of Immunology and Infectious Biology, Institute of Microbiology, Biotechnology and Immunology, Faculty of Biology and Environmental Protection, University of Lodz, Lodz, Poland, [2]The BioMed-Chem Doctoral School, University of Lodz and Lodz Institutes of the Polish Academy of Sciences, Lodz, Łódź, Poland.

Introduction: There is substantial evidence, that gut microbiota, including *Helicobacter pylori* (*HP*), along with hyperlipidemia contribute to the development of Coronary Heart Disease (CHD). Our results indicated that *HP* infection and high-fat diet act synergistically in development of proinflammatory and potentially proatherogenic endothelial cell environment. Moreover, *in vitro* model of vascular endothelial response, driven by *HP* components, showed endothelial cells activation, deregulation of apoptosis and enhancement of Collagen secretion.
Aim: To investigate the role of *HP* components in a development of atherosclerotic angiogenesis, which may be potentially promoted in the proinflammatory and proatherogenic endothelial cell environment.
Methods: Human microvascular endothelial cells (HMEC-1) exposed to *HP* components and reference substances (LPS *E. coli*) were examined for formation of capillary like tubes (*in vitro* assay for testing angiogenesis). Fibroblast Growth Factor (FGF) served as positive control. The network of tube-like forms was visualized using microscope and the intensity of the angiogenesis was analyzed.
Results: Our results indicated that *HP* LPS intensified the process of capillary like tube formation by HMEC-1 cells, suggesting the role of *HP* components in inducing angiogenesis. Interestingly, *HP* LPS appeared to promote angiogenesis more intensively than LPS *E. coli*, which served as a reference substance.
Conclusions: Our results showed that *H. pylori* infection may provide conditions, which promote atherosclerotic angiogenesis. The observation was supported by the fact, that vascular endothelial cells, exposed to *HP* components, secrete massive amount of Collagen, which can be considered in terms of proregenerative activity in response to *HP* infection

P. Rusek-Wala: None. A. Krupa: None. W. Gonciarz: None. M. Chmiela: None.

P04.07

HELICOBACTER PYLORI INFECTION, DISTRIBUTION OF *DUP*A VIRULENCE GENE AND ASSOCIATED CLINICAL OUTCOMES: THE SITUATION IN CENTRAL WEST BRAZIL

G. R. MAXIMO[1], A. F. P. L. RAMOS[1], L. L. D. SILVA[1], J. N. PEREIRA[2], M. P. DOS SANTOS[2], L. T. RASMUSSEN[2], A. M. BRITO[3], ***M. S. BARBOSA[1]***

[1]University Federal of Goiás, Goiânia, Brazil, [2]Faculty of Medicine of Marília, Marília, Brazil, [3]Goiás Association to Combat Cancer, Goiânia, Brazil.

Helicobacter pylori (*H. pylori*) is a Gram-negative bacterium that affects about 50% of the world population. The parasite-host relationship is decisive for the clinical outcomes of gastroduodenal diseases. The duodenal ulcer promoter (*dup*A) gene of *H. pylori* can be considered a marker of virulence in gastroduodenal diseases. In this sense, the objective of the study was to evaluate the presence of the *dup*A gene in infectious strains isolated from patients with severe and non-severe gastropathies in the Midwest of Brazil. The patients were segregated into three groups: severe diseases (patients with gastric cancer- CG), non-severe disease (patients with gastritis) and control (patients without gastric complaints). Pearson's chi-square test with a 5% significance level was applied to categorical variables to assess differences between groups.
A total of 82 gastric biopsies were analyzed using histological and molecular techniques. The *dup*A gene was detected in 70.7% (58/82) of the total samples. In the group of non-severe patients, the gene was detected in 75% (39/52), followed by the normal group 71% (10/14) and CG 56.2% (9/16). There was no significant difference between the presence of the *dup*A gene and the associated risk factors, sex, age and education level. Furthermore, *dup*A was not associated with the development of severe gastropathies in the population studied. In conclusion the *dup*A gene cannot be considered a biomarker for severe diseases, requiring a larger sample size to evaluate the role of this gene in the development of gastropathies in the study population.

G.R. Maximo: None. A.F.P.L. Ramos: None. L.L.D. Silva: None. J.N. Pereira: None. M.P. dos Santos: None. L.T. Rasmussen: None. M.S. Barbosa: None. A.M. Brito: None.

P04.08

EXPRESSION OF APOPTOSIS AND PROLIFERATION PROTEINS BY THE CELLS OF INFLAMMATORY INFILTRATE OF GASTRIC LAMINA PROPRIA IN PATIENTS WITH PEPTIC ULCER DISEASE

V. V. TSUKANOV[1]*, N. N. BUTORIN[2], A. V. VASYUTIN[1], J. L. TONKIKH[1], O. V. PERETYAT'KO[1], R. V. RYABOKON'[1,3], V. A. KHORZHEVSKIY[3,4]*

[1]Federal Research Centre "Krasnoyarsk Science Centre" of the Siberian Branch of Russian Academy of Science, "Scientific Research Institute of medical problems of the North", Krasnoyarsk, Russian Federation, [2]Federal State-Funded Educational Institution of Higher Education "Katanov Khakass State University", Abakan, Russian Federation, [3]Krasnoyarsk regional pathological and anatomical bureau, Krasnoyarsk, Russian Federation, [4]Federal State Budgetary Educational Institution of Higher Education "Prof. V.F. Voino-Yasenetsky Krasnoyarsk State Medical University" of the Ministry of Healthcare of the Russian Federation, Krasnoyarsk, Russian Federation.

Aim: To study the expression of apoptosis and proliferation proteins by the cells of inflammatory infiltrate of gastric lamina propria (IIGLP) in patients with chronic non-atrophic gastritis (CG) and peptic ulcer disease (PUD).
Methods: In the Abakan city (Khakassia), an endoscopy with biopsies from the antrum and gastric corpus mucosa was performed in 44 patients with CG (23 Khakasses and 21 Caucasoids) and 47 patients with PUD (22 Khakasses and 25 Caucasoids). Proliferation marker Ki67, antiapoptotic protein bcl-2 and proapoptotic factor CPP-32 were determined by immunohistochemical method in IIGLP.

Results: The proportion of cells with Ki67 expression in antral IIGLP tended to increase in PUD patients compared with CG patients in both the Khakasses (1.6% versus 1.1%; *p*=0.08) and Caucasoids (1.3% versus 0.8%; *p*=0.06). Bcl-2 was detected in 32.2% of IIGLP cells in Khakasses with PUD and in 24.8% of IIGLP cells in Khakasses with CG (*p*=0.04); in 38.9% of IIGLP cells in Caucasoids with PUD and in 27.1% of IIGLP cells in Caucasoids with CG (*p*=0.02) in the gastric body. CPP-32 had a lower expression in IIGLP in patients with PUD compared to individuals with CG in Khakasses (40.0% versus 55.5%; *p*=0.04) and Caucasoids (38.3% versus 52.1; *p*=0.04) in the antrum.
Conclusion: We found a tendency to increase the proliferation marker Ki67, lower values of the pro-apoptotic protein CPP-32, and a higher level of the anti-apoptotic protein bcl-2 in PUD patients, compared with CG patients. This indicates a shift in the proliferative-apoptotic relationship towards proliferation in PUD patients.

V.V. Tsukanov: None. N.N. Butorin: None. A.V. Vasyutin: None. J.L. Tonkikh: None. O.V. Peretyat'ko: None. R.V. Ryabokon': None. V.A. Khorzhevskiy: None.

P04.09

REVISITED ROLE OF *HELICOBACTER PYLORI* CAGPAI, CAGA, VACA AND GGT IN APOPTOSIS DURING INFECTION OF GASTRIC EPITHELIAL CELLS

J. KNORR, I. SHARAFUTDINOV, N. TEGTMEYER, ***S. BACKERT***
Friedrich-Alexander University Erlangen-Nuremberg, Erlangen, Germany.

Two virulence factors of *H. pylori* have been supposed to promote the induction of apoptosis (e.g., vacuolating cytotoxin VacA or γ-glutamyl transpeptidase GGT), while others display anti-apoptotic functions (e.g., effector protein CagA). Previous analyses gathered insights into the function of these proposed pro- and anti-apoptotic elements, however, many studies usually employed strategies such as transfection with DNA constructs expressing the factor of interest or treatment with purified proteins, which provided only limited information about how they could affect host cell death or survival in a complex scenario upon infection. Here we aimed to study the role of *H. pylori* virulence factors on apoptosis during infection of AGS gastric epithelial cells.
For this purpose, we generated single and double deletion mutants of the *H. pylori*, targeting genes with proposed pro-apoptotic effects (Δ*vacA*, Δ*ggt,* Δ*vacA/ggt*), anti-apoptotic effects (Δ*cagA*), or the *cag* T4SS (Δ*cag*PAI, Δ*cagE*). We infected AGS cells and determined the percentage of apoptotic cells by staining with AnnexinV and fluorescence microscopy. While the reduction of apoptotic cells in infections with strains lacking the pro-apoptotic factors VacA or GGT were expected, it came as a surprise that the *H. pylori* mutant lacking the anti-apoptotic factor CagA only showed a slight increase in apoptosis, compared to infections with wild-type bacteria. Interestingly, the Δ*cag*PAI and Δ*cagE* mutants exhibited a far greater rate of apoptosis than the Δ*cagA* mutant, which lead to the conclusion that the *cag* T4SS itself, but not translocated CagA, is the primary driver of *H. pylori*´s anti-apoptotic properties during infection.

S. Backert: None. J. Knorr: None. I. Sharafutdinov: None. N. Tegtmeyer: None.

P04.10

LOCAL CYTOKINE STATUS IN *HELICOBACTER PYLORI* INFECTION

G. S. ISAEVA[1]*, R. ISAEVA*[2]*, E. AGAFONOVA*[1]*, N. EFIMOVA*[3]*, R. BURKHANOV*[4]
[1]Kazan State Medical University, Kazan Research Institute of Epidemiology and Microbiology, Kazan, Russian Federation, [2]I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russian Federation, [3]Republican Clinical Oncological Dispensary Republic of Tatarstan, Kazan, Russian Federation, [4]Polyclinic of Medical and Sanitary unit of the Ministry of Internal Affairs of the Russian Federation in the Republic of Tatarstan, Kazan, Russian Federation.

Objective: To study the level of cytokines in the gastric mucosa depending on the degree of *H. pylori* contamination.

Material and methods: To detect *H. pylori* (HP), 52 patients with chronic gastroduodenitis were examined using the cytological method. The levels of the cytokines TNF-α, IL-1β, IFN-γ and the apoptosis marker sCD95 (sAPO-1/FAS) were determined using the enzyme immunoassay.
Results: The main group included 40 patients -HP (+), the comparison group included 12 (HP -). The HP contamination of gastric mucosa in low degree was detected in 45 % cases, in medium degree - in 40 % cases, in high degree -15 % cases. In the HP+ group there was an increase of the pro - inflammatory cytokines - IL-1 by 8.5 times (p<0.05), TNF-α by 12.2 times (p<0.05) and an increased level of anti-inflammatory cytokine IL-10 (p<0.05) compared to HP negative patients. The levels of IL-1β and TNF-α progressively increase depending on the degree of HP contamination. The TNF-α level correlates with the dynamics of the sAPO-1/FAS increase, which reflects the readiness of the gastric mucosa cells for apoptosis.
Conclusion: The increase in the degree of HP gastric mucosa contamination leads to a sharp increase in the levels of proinflammatory cytokines associated with TNF-mediated apoptosis, and an increase in the processes of programmed cell death. In the framework of pathogen-induced immunosuppression, with a high degree of HP contamination, there is an increase in the production of anti-inflammatory cytokine IL-10 and inhibition of IFN-γ.

G.S. Isaeva: None. R. Isaeva: None. E. Agafonova: None. N. Efimova: None. R. Burkhanov: None.

TABLE 1. LOCAL CYTOKINE STATUS IN PATIENTS WITH CHRONIC GASTRODUODENITIS.

Groups of patients with chronic gastroduodenitis	IL 1 пг/мл M±m	TNF- α пг/мл M±m	IL 10 пг/мл M±m	IFN γ пг/мл M±m	sCD95(sAPO-1/FAS) пг/мл M±m
Low degree HP+	3.2 ±1.8	3.2±0.5	19.5±1.8	3.8±0.8	1.9±0.4
Medium degree HP+	27.9±3.1	17.1±0.8	36.8±2.4	2.0±0.2	7.5±0.6
High degree HP+	39.8±2.7	20.1±0.8	40.8±3.7	1.3±0.8	10.5±0.8
Total: Chronic gastroduodenitis (HP+)	23.8±2.6	13.4±0.8	32.4±0.8	2.3±0.3	6.8±0.6
Chronic gastroduodenitis H.pylori- (comparison group)	2.8 ±0.9	1.1±0.8	20.1±0.8	3.1±0.2	1.6±0.2

P04.11

ANALYSIS OF THE *HELICOBACTER PYLORI* VACA VIRULENCE GENE IN DYSPEPTIC PATIENTS

J. C. P. SERRA[1], L. L. D. SILVA[1], D. M. M. CARDOSO[2], J. N. PEREIRA[3], M. P. DOS SANTOS[3], L. T. RASMUSSEN[3], ***M. S. BARBOSA[1]***
[1]University Federal of Goiás, Goiânia, Brazil, [2]Institute of the Digestive System, Goiânia, Brazil, [3]University of Medicine of Marília, Marília, Brazil.

Helicobacter pylori (*H. pylori*) is a bacterium that affects more than 50% of the world population. The clinical outcomes of *H. pylori* infection are the result of pathogen-host interaction. The vacuolating cytotoxin A (*vac*A) gene is considered an important virulence factor. The aim of this study was to detect the presence of the *H. pylori vac*A gene and to evaluate the association of this marker with gastropathies. 119 gastric biopsy samples were collected from dyspeptic patients in central Brazil. The detection of the microorganism and the presence of the molecular marker were performed using specific primers for the 16S rRNA and *vac*A genes, respectively. The results demonstrate a total of 63% of the patients were positive for *H. pylori*, of which 57% were infected with *H. pylori* vacA positive strains. Infection with the positive *H. pylori* vacA strain was more prevalent in patients older than 45 years. Approximately 94% of patients infected with positive *H. pylori vac*A strains were diagnosed with some type of gastric disease. The most common dyspepsias were gastritis (53.4%) and duodenitis (16%). Infection with *H. pylori vac*A positive, was associated with severe lesions earlier when compared with patients not infected by the microorganism. In this study, the *vac*A gene was considered a molecular marker of severe diseases in young patients. Additional studies are needed to evaluate the most virulent allelic subtypes of the *vac*A gene, as well as the profile of resistance to antibiotics used in the therapeutic regime of circulating strains in the region.

M.S. Barbosa: None. J.C.P. Serra: None. L.L.D. Silva: None. D.M.M. Cardoso: None. J.N. Pereira: None. M.P. dos Santos: None. L.T. Rasmussen: None.

P04.12

SEARCHING FOR CROSS-REACTING ANTIBODIES PRODUCED DURING *HELICOBACTER PYLORI* INFECTION IN AN EXPERIMENTAL ANIMAL MODEL

A. TOMASZEWSKA[1,2], *W. GONCIARZ*[1], *A. KRUPA*[1], *M. CHMIELA*[1]
[1]Department of Immunology and Infectious Biology, Institute of Microbiology, Biotechnology and Immunology, Faculty of Biology and Environmental Protection, University of Lodz, Banacha 12/16, Lodz, Poland, [2]The Bio-Med-Chem Doctoral School of the University of Lodz and Lodz Institutes of the Polish Academy of Sciences. Faculty of Biology and Environmental Protection, University of Lodz, Łódź, Poland.

Introduction: Bacterial antigens including *Helicobacter pylori* (*HP*) can potentially contribute to the development of systemic diseases based on antigenic mimicry and cross-reactive antibodies. Bioinformatic analysis showed, that *HP* cytotoxin associated gene A (CagA) protein possess sequence similar to receptor of human tumor necrosis factor (TNFR) and apoptotic proteins: caspase 3 and Bcl-2 protein.
Aim: To assess the production of anti-CagA antibodies, and antibodies towards peptides (P)with common CagA and TNFR (P1), caspase 3 (P2) or Bcl-2 (P3) sequences, during *HP* infection in *Cavia porcellus*.
Methods: The serum samples of control animals or experimentally infected with *HP* were collected at 7, 28 and 60 days after inoculation. The levels of IgG antibodies: anti-CagA, anti- P1, anti-P2 and anti-P3, were evaluated using the ELISA assay.
Results: Anti-CagA and anti-P1 antibodies were detected in serum samples of *HP* infected animals at 7 and 28 days of infection whereasanti-P2 and anti-P3antibodies were detected in serum samples from animals at 28 days after inoculation. There was no antibodies with such specificity inserum samples of uninfected animals.
Conclusions: The induction during *HP* infection of antibodies, cross-reacting with *HP* CagA and common sequences of human TNFR and/or apoptotic proteins may suggest a possible interference of such antibodies with various cellular mechanisms of the host.

A. Tomaszewska: None. W. Gonciarz: None. A. Krupa: None. M. Chmiela: None.

P04.13

DOWNREGULATION OF PRO-REGENERATIVE ACTIVITY OF IL-33 IN THE MILIEU OF *H. PYLORI* LIPOPOLYSACCHARIDE

W. GONCIARZ[1], *A. KRUPA*[1], *A. MORAN*[2], *A. TOMASZEWSKA*[1,3], *P. PŁOSZAJ*[1], *M. CHMIELA*[1]
[1]Department of Immunology and Infectious Biology, Institute of Microbiology, Biotechnology and Immunology, Faculty of Biology and Environmental Protection, University of Lodz, Lodz, Poland, [2]Department of Microbiology, School of Natural Sciences, National University of Ireland Galway, Galway, Ireland, Golway, Ireland, [3]The Bio-Med-Chem Doctoral School, University of Lodz and Lodz Institutes of the Polish Academy of Sciences, Banacha st 12/16, 90-237 Lodz, Poland, Łódź, Poland.

Introduction: Lipopolysaccharide (LPS) of *Helicobacter pylori*-(Hp) which can be released during infection due to bacterial cell lysis is involved in gastric barrier disintegration and pathogenesis of Hp related disorders. IL-33 is a pro-inflammatory cytokine and signaling molecule, which alerts the host immune system and allows to restore gastric tissue homeostasis.
Aim: To elucidate the interference of Hp LPS with the pro-regenerative activity of IL-33 resulting in diminished gastric cells recovery.
Methods: Primary gastric epithelial cells and fibroblasts from *Cavia porcellus* were used as experimental models. Cells transfected with IL-33 siRNA, untreated or exposed to LPS Hp were sub-cultured in the medium with or without exogenous IL-33. The biomarkers of oxidative stress and apoptosis were assessed in conjunction with activation Erk, production of collagen I and soluble ST2 as well as the effectiveness of cell migration.

Results: IL-33 driven migration of gastric tissue cells was related to downregulation of oxidative stress and apoptosis, control of Erk activation and enhanced production of collagen I. However, these effects induced by IL-33 were diminished in the presence of LPS Hp, potentially due to interference with of IL-33 due to apoptotic enzymes, enhanced oxidation or elevated level of soluble ST2 as IL-33 decoy receptor.
Conclusions: In the milieu of Hp LPS, the recovery of gastric cells initiated by IL-33 can be diminished due to downregulation of its pro-regenerative activity.
Funding: This research was funded by University of Lodz, grant number 25/IDUB/MLOD/2021. The role of *H. pylori* LPS in the maintenance of inflammation in the gastric mucosa by excluding the alarm IL-33.

W. Gonciarz: None. A. Krupa: None. A. Moran: None. A. Tomaszewska: None. P. Płoszaj: None. M. Chmiela: None.

P04.14

ADP-HEPTOSE IS THE DETERMINANT OF *HELICOBACTER PYLORI* RESPONSIBLE FOR THE DAMPENING OF HLA-II EXPRESSION IN MACROPHAGES

M. DE BERNARD[1], *S. COLETTA*[1], *C. DELLA BELLA*[2], *M. M. D'ELIOS*[2], *C. JOSENHANS*[3]
[1]University of Padova, Padova, Italy, [2]University of Florence, Florence, Italy, [3]Max von Pettenkofer Institute, Munich, Germany.

In the recent past, we evidenced that infection of macrophages by *H. pylori* results in the decline of HLA-II expression due to the up-regulation of some miRNAs, especially miR146b, targeting CIITA, the master regulator for the transcription of HLA-II genes. The results of the present investigation revealed that the bacterial factor responsible for the downregulation of HLA-II complex in macrophages is ADP-heptose, an intermediate metabolite in the biosynthetic pathway of LPS. It is known as a microbe-associated molecular pattern (MAMP) that, once injected into the cytosol of epithelial cells by the TIVSS, leads to the activation of NF-κB and to a strong pro-inflammatory response through the secretion of IL-8 and other mediators. Our findings support the notion that ADP-heptose, which is partially released by the bacteria, may get access into the cytosol of macrophages regardless the TIVSS and endocytosis. Following the activation of NF-κB, it elicits a pro-inflammatory response, as in gastric epithelial cells, but in parallel, it upregulates the expression of miR146b that, in turn, depresses the expression of CIITA. These findings imply that *H. pylori*, by taking advantage of ADP-heptose, recruits inflammatory cells, but then exploits them to establish its survival niche in the face of the robust Th1 immune response which is elicited in the gastric mucosa of infected patients. Moreover, since ADP-heptose is an intermediate of the lipopolysaccharide biosynthetic pathway in Gram-negative bacteria, our results suggest that the mechanism of immune evasion based on this MAMP might be adopted by other bacteria.

M. de Bernard: None. S. Coletta: None. C. Della Bella: None. M.M. D'Elios: None. C. Josenhans: None.

P04.15

PRO-INFLAMMATORY AND ANTI-INFLAMMATORY CYTOKINES AND IMMUNOGLOBULINS IN THE DEVELOPMENT OF CHRONIC ATROPHIC GASTRITIS WITH *HELICOBACTER PYLORI* INFECTION

O. SMIRNOVA, *A. SINYAKOV*
Federal Research Center "Krasnoyarsk Scientific Center of the Siberian Branch of the Russian Academy, Krasnoyarsk, Russian Federation.

The aim of this investigation was to study the content of pro-inflammatory and anti-inflammatory cytokines and immunoglobulins in patients with chronic atrophic gastritis associated with *Helicobacter pylori* infection.

Methods: 50 patients with *Helicobacter pylori* were studied. The control group consisted of 50 healthy individuals. Determination of the content of cytokines (IL-2, IL-4, IL-8, L-10) in the blood serum was performed by enzyme-linked immunosorbent assay. The quantitative determination of IgA, IgM, IgG, IgE. Statistical data processing was carried out using Statistica software packages for Windows 8.0.
Results: In patients with chronic atrophic gastritis with *Helicobacter pylori*, an increase in IL-2, IL-4, IL-8 and IL-10 was detected in comparison to the control group. In patients with chronic atrophic gastritis, in combination with *H. pylori* infection, unidirectional changes in the humoral immunity were observed, an increase in IgG and an increase in IgA compared with the control group.
Conclusions: In atrophic gastritis with *Helicobacter pylori* infection, immuno-inflammatory changes in the Th-1 and Th-2 types are activated. Activation of pro-inflammatory and anti-inflammatory cytokines helps to limit the inflammatory process in the gastric mucosa. pathogen elimination does not occur, which contributes to an increase in the infectious load on the patient and the progression of atrophic changes in the gastric mucosa. Despite the activation of the production of specific antibodies, humoral immunity in chronic atrophic gastritis in combination with *H. pylori* infection is ineffective, since there is no sufficient elimination of the pathogen.

O. Smirnova: None. A. Sinyakov: None.

P04.16

TLR1-SNP-RS4833095-GENOTYPE IS NOT ASSOCIATED WITH INFLAMMATION PHENOTYPE IN *H. PYLORI*-NEGATIVE PATIENTS

M. KARLE[1], C. THON[1], D. JECHOREK[2], P. MALFERTHEINER[3,1], ***A. LINK[1]***
[1]Department of Gastroenterology, Hepatology and Infectious Diseases, Otto-von-Guericke University Hospital, Magdeburg, Germany, [2]Department of Pathology, Otto-von-Guericke University Hospital, Magdeburg, Germany, [3]Department of Internal Medicine II, Ludwig-Maximilians University Hospital, Munich, Germany.

Introduction: *G*enetic factors such as single nucleotide polymorphisms (SNP) in toll-like-receptor-1 (TLR1) may influence the intensity of *H. pylori* gastritis. We aimed to evaluate the potential impact of TLR1-SNP-rs4833095 genotype on the intensity and type of gastric pathologies in *H. pylori* negative subjects.
Methods: 581 patients have been prospectively included in the study. During upper GI endoscopy, stomach biopsies were taken for histological, microbiological evaluation, and *H. pylori*-serology was obtained. Based on histopathological findings, the patients were classified using the Sydney system in patients with normal mucosa (N), chronic non-atrophic gastritis (CNAG), atrophic gastritis (AG) with/without intestinal metaplasia (IM) and gastric cancer. DNA was isolated from gastric biopsies and blood samples and the TLR1-SNP was determined using TaqMan Assay.
Results: Overall 343 (59%) of patients had TT-, 218 (37.6%) TC- and only 20 (3.4%) CC-genotype, respectively. *H. pylori*-serology was negative in 383 (65.9%). The distribution of the TLR1-SNP in *H. pylori* negative patients was comparable to overall cohort with TT-genotype in 236 (61.6%), TC- in 133 (34.7%) and CC-genotype in 14 (3.7%) CC. To prevent potential minority bias, TC-/CC-genotype were combined for the further analysis. We observed no significant differences between TT and TC-/CC-genotype in various variables of the gastric pathology. Only the gastric cancer group showed a higher prevalence of TT-genotype (p=0.0068).
Conclusion: TT-genotype of the TLR1-SNP-rs4833095 is the most common genotype followed by TC and CC. Although TT-genotype was more common in gastric cancer patients, no significant association was observed between TLR-SNP and extend of gastritis in *H. pylori*-negative patients.

M. Karle: None. C. Thon: None. D. Jechorek: None. P. Malfertheiner: None. A. Link: None.

P04.17

ANALYSIS OF INDICATORS CHARACTERIZING THE SYSTEM IMMUNE RESPONSE IN PATIENTS WITH *HELICOBACTER PYLORI*

E. S. AGEEVA[1], *O. V. SHTYGASHEVA*[2]
[1]Medical Academy named after S.I. Georgievsky of Crimean Federal University named after V.I. Vernadsky, Simferopol, Russian Federation, [2]Khakass State University named after N.F. Katanov, Abakan, Russian Federation.

Aim: to study the role of risk factors in pathogenesis of peptic ulcer (PU) and chronic gastritis (CG).
Material and method: Patients with PU (n=21) and CG (n=34) were examined. morphological characteristics of ulcer and dyspepsia were performed of esophagofibrogastroduodenoscopy. *Helicobacter pylori* (HP) was diagnosed morphological, urease methods in the gastric mucosa, the level of specific immunoglobulins. Immunophenotype of blood lymphocytes (CD3+, CD4+ and CD8+) was determined by laser flow cytometry. Apoptosis of blood lymphocytes was assessed after 24 h of cultivation, using karyopathological and cytopathological changes in cells. The level of cytokines (IL-2,4,6,8, TNFα) determined by ELISA. Factor analysis was made using program Statistica 8.0.
Results: Factor analysis of a number of indicators characterizing the state of the systemic immune response was carried out. Use of mathematical processing made it possible to divide all indicators according to their significance into two groups. In patients with CG, the Factor 1 group for the development of the disease included indicators of CD3+ (0.95), CD4+ (0.86) and CD8+ (0.89) blood lymphocytes, Factor 2 - the total number of blood lymphocytes (-0.74) and apoptosis (0.75). In patients with PU two groups of factors were also identified. The Factor 1 group included blood lymphocytes (0.93), their subpopulations (CD3+ - 0.81 and CD4+ - 0.97) and lymphocyte apoptosis (0.93). The structure of the 2nd group included cytokines - IL-4 (0.73), IL-8 (0.90), TNFα (0.90).
Conclusion: The factors most significant for the development of HP-associated inflammation in the pathogenesis of PU and CG were identified.

E.S. Ageeva: None. O.V. Shtygasheva: None.

P04.18

ASSOCIATION BETWEEN THE *HELICOBACTER PYLORI* CAGA VIRULENCE GENE AND THE SEVERITY OF GASTRODUODENAL LESIONS

L. D. R. MARQUES[1], *A. S. OLIVEIRA*[1], *L. L. D. SILVA*[1], *A. F. P. L. RAMOS*[1], *A. M. BRITO*[2], *J. N. PEREIRA*[3], *M. P. DOS SANTOS*[4], *L. T. RASMUSSEM*[4], ***M. S. BARBOSA***[1]
[1]University Federal of Goiás, Goiânia, Brazil, [2]Goiás Association to Combat Cancer, Goiânia, Brazil, [3]Faculty of Medicine of Marília, Marilia, Brazil, [4]Faculty of Medicine of Marília, Marília, Brazil.

Helicobacter pylori colonizes approximately half of the world's human population. The microorganism is the etiologic agent of several non-severe esogastroduodenal lesions (gastritis, esophagitis, duodenitis) and severe (ulcer, atrophy, metaplasia and gastric adenocarcinoma). In this sense, the objective of the study was to evaluate the presence of the *cag*A gene in infectious strains isolated from patients with severe and non-severe gastropathies in the Midwest of Brazil. The patients were segregated into three groups: severe diseases (patients with gastric cancer- CG, ICD-10, C16), non-severe disease (patients with gastritis) and control (patients without gastric complaints). Pearson's chi-square test with a 5% significance level was applied to categorical variables to assess differences between groups. Of the 82 gastric biopsies analyzed using histological and molecular techniques, 19.5% (16) were CG, 63.4% (52) gastritis and 17.1% (14) healthy patients.
Among CG patients infected with positive CagA strains, 61% were men, mean age 51.7 ± 9.8, and 69.2% had a basic level of education. No statistically significant associations were found between *cag*A and the severity of the lesions, as well as with the sex and age of the patients. The results found are extremely relevant, since there is a lack of research on this topic in the study population. In addition, the characterization of circulating strains is extremely relevant for personalized medicine, especially with regard to the prognosis and treatment of the patient.

L.D.R. Marques: None. L.L.D. Silva: None. A.F.P.L. Ramos: None. A.M. Brito: None. J.N. Pereira: None. M.P. dos Santos: None. M.S. Barbosa: None. L.T. Rasmussem: None. A.S. Oliveira: None.

ELECTRONIC POSTER ROUND 5

Epidemiology

P05.01

RELATIONSHIP OF ALCOHOL AND TOBACCO CONSUMPTION AND THE DEVELOPMENT OF GASTRIC ADENOCARCINOMA

A. F. P. L. RAMOS[1], G. R. DE SOUSA[1], G. A. S. SOARES[1], F. A. D. MORAES[1], L. L. D. SILVA[1], L. G. SILVEIRA[1], A. M. BRITO[2], A. A. FERNANDES[3], G. A. FERNANDES[3], M. P. CURADO[3], ***M. S. BARBOSA***[1]
[1]University Federal of Goiás, Goiânia, Brazil, [2]Goiás Association to Combat Cancer, Goiânia, Brazil, [3]AC-Camargo Center, São Paulo, Brazil.

Gastric cancer is the fifth most common malignancy in the world. The aim of the study was to describe the relationship between alcohol and tobacco consumption and the development of gastric adenocarcinoma (AdG). This is a hospital-based case-control study, carried out in the Midwest region of Brazil, in the period 2019-2021. Data were collected using structured questionnaires. The groups were divided into: cases (patients with confirmed diagnosis of AdG by histology, ICD-10, C16), control 1 (dyspeptic patients without neoplasms) and control 2 (patients without gastric complaints).
Categorical variables were compared using Pearson's chi-square test and continuous variables using the Kruskal-Wallis test, with a significance level of 5%. Of the 404 individuals, 24.2% (98) were patients with AdG, 54.1% (41) control 1 and 34.7% (140) control 2. Among the patients with AdG, 55.1% (54) were men, 41.8% (41) were between 56 and 65 years old, 17.4% (17) were smokers, 31.6% (31) ex-smokers, 66.7% (32) consumed up to 40 packs / year, 58.2% (57) were alcoholics and 66.7% (38) consumed up to 51.4 g/day of alcohol. Significant differences were observed between the groups for sex, age group and tobacco consumption in packs/year, 33.3% (16) of the patients with AdG had a consumption greater than 40 packs / year. However, the same was not observed for the variables of alcohol consumption. We conclude that it is necessary to reinforce smoking cessation and prevention policies, as well as to create alcohol prevention programs in the population.

A.F.P.L. Ramos: None. G.R. de Sousa: None. G.A.S. Soares: None. F.A.D. Moraes: None. L.L.D. Silva: None. L.G. Silveira: None. A.M. Brito: None. A.A. Fernandes: None. G.A. Fernandes: None. M.P. Curado: None. M.S. Barbosa: None.

P05.02

DETECTION OF *HELICOBACTER SUIS* IN PORK MEAT PRODUCTS AIMED TO HUMAN CONSUMPTION

M. GARCÍA-FERRÚS*, A. GONZÁLEZ PELLICER, M. A. FERRÚS PÉREZ*
Polytechnic University of Valencia, Valencia, Spain.

Helicobacter suis is considered a zoonotic pathogen associated with gastric diseases, such as gastric ulcers, gastritis and gastric MALT lymphoma in humans. This organism is the most frequently gastric non-*Helicobacter pylori* (HNPH) species detected in human gastric biopsies. Pigs are the natural host of *H. suis,* and this pathogen has been detected in up 60% of farm pig stomachs. Manipulation or consumption of contaminated pork meat has been suggested to be a possible source of transmission for *H. suis,* although the risk of exposure is not clear. Thus, our aim was to determine the prevalence of *H. suis* among pork products for human consumption in Valencia (Spain).
Twenty-five pork livers were collected from different local butchers. Briefly, 10g were enriched in 40ml of Brucella Broth supplemented with 10ml of Fetal Bovine Serum at 37ºC for 48h, under microaerophilic conditions. For each sample, 10ml aliquots of the broth before and after 48h enrichment were concentrated and analyzed by multiplex PCR. All PCR products of positive samples were sequenced for confirm the presence of *H. suis*. *H. suis* was detected by PCR in seven samples (46%). According to our results, *H. suis* is highly prevalent in our geographical area. Direct PCR can be a valid method to detect *H. suis* from pork meat.

This work has been supported by a PID2019-105691RB-I00 Research Project from Ministerio de Ciencia e Innovación, Spain.

M. García-Ferrús: None. A. González Pellicer: None. M.A. Ferrús Pérez: None.

P05.03

EVALUATION OF THE CHEMIOPROTECTIVE ROLE OF PEQUI FRUIT *(CARYOCAR BRASILIENSE)* IN GASTRIC CANCER

L. G. S. SILVEIRA[1], A. F. P. L. RAMOS[1], G. R. DE SOUSA[1], G. A. S. SOARES[1], F. A. D. MORAES[1], L. L. D. SILVA[1], A. M. BRITO[2], A. A. FERNANDES[3], G. A. FERNANDES[3], M. P. CURADO[3], ***M. S. BARBOSA***[1]
[1]University Federal of Goiás, Goiânia, Brazil, [2]Goiás Association to Combat Cancer, Goiânia, Brazil, [3]AC-Camargo Center, São Paulo, Brazil.

Gastric cance (GC) is the sixth most incident neoplasia in the world. The Brazilian flora has plants with great chemoprotective potential, including pequi (*Caryocar brasiliense*). This fruit from central Brazil is rich in β-carotene and lycopene pigments. The chemoprotective role of pequi has been demonstrated in liver cancer, however, there is an absence of studies in the CG. In this sense, the objective of the work was to carry out a preliminary analysis on the chemopreventive potential of *C. brasiliense* in CG. This is a hospital-based case-control study, carried out from 2019 to 2021, paired by sex and age, in which 214 questionnaires were analyzed. Of the total, 78 were from the case group (patients with CG) and 136 from the control group (patients without gastric complaints). Pearson's chi-square test was applied to categorical variables in order to assess the differences between the case and control groups.
CG was more prevalent in the 46 to 60 age group (44.87%, p <0.001), with the male sex being more affected (55%, p <0.001). The number of individuals who reported consuming pequi was similar between the two groups, 75.64% in the case group and 77.21% in the control group. However, there was a higher consumption of pequi in the case group (21.79% consume> 10.6 g / day, $p = 0.013$). It was not possible to determine the chemopreventive role in the CG, requiring a larger sample size to assess the consumption pattern of this fruit in the study population.

L.G.S. Silveira: None. A.F.P.L. Ramos: None. G.R. de Sousa: None. G.A.S. Soares: None. F.A.D. Moraes: None. L.L.D. Silva: None. A.A. Fernandes: None. G.A. Fernandes: None. M.P. Curado: None. M.S. Barbosa: None. A.M. Brito: None.

P05.04

PREVALENCE OF *HELICOBACTER PYLORI* INFECTION IN ASYMPTOMATIC CHILDREN FROM SOUTHEASTERN BRAZIL

A. B. M. CARLOS[1], *V. E. COSTA[2], M. A. M. RODRIGUES[3]*
[1]São Paulo State University (UNESP), Botucatu, Brazil, [2]Stable Isotope Center, Botucatu Institute of Biosciences (IBB), São Paulo State University (UNESP), Botucatu, Brazil, [3]Department of Pathology, Botucatu Medical School (FMB), São Paulo State University (UNESP), Botucatu, Brazil.

The prevalence of *Helicobacter pylori* infection is decreasing worldwide, but is still high in developing countries. We have previously observed 52% of *H. pylori* infection in a cohort of children and adolescents with chronic non ulcer dyspepsia. This prompted us to investigate the prevalence of *H. pylori* infection in asymptomatic children from the same region at Southeastern Brazil and to evaluate the risk factors for the acquisition of the infection.
This cross-sectional study analyzed 161 children (5-13 years), mean age 7.8 years, from a public school at Botucatu, São Paulo state, Southeastern Brazil, which is considered a developed area in Brazil. The status of *H. pylori* infection was determined by urea breath test; and the risk factors for acquisition of the infection were based on a socio demographic questionnaire answered by children's guardian. The overall prevalence of *H. pylori*

infection was 20.5% (33/161); gender prevalence was 18.7% (15/80) for females and 22.2% (18/81) for males. Children with a prior record of gastric diseases, like gastritis and gastroesophageal reflux disease had higher risk to present *H. pylori* infection. In summary, the prevalence of *H. pylori* infection in asymptomatic school children from Southeastern Brazil is lower than that recorded in dyspeptic children from the same region, but higher than the reported in developed countries. History of gastric diseases was the main risk factor for the acquisition of *H. pylori* infection in this cohort of asymptomatic school children from Brazil.

A.B.M. Carlos: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Modest; CNPq. V.E. Costa: None. M.A.M. Rodrigues: None.

P05.05

DIETARY PATTERNS AND *HELICOBACTER PYLORI* INFECTION IN DYSPEPTIC PATIENTS IN CENTRAL WEST BRAZIL.

G. A. S. SOARES[1], F. A. D. MORAES[1], A. F. P. L. RAMOS[1], G. R. DE SOUSA[1], L. G. SILVEIRA[1], L. L. D. SILVA[1], A. M. BRITO[2], A. A. FERNANDES[3], G. A. FERNANDES[4], M. P. CURADO[4], S. B. SANTIAGO[5], ***M. S. BARBOSA***[1]

[1]University Federal of Goiás, Goiânia, Brazil, [2]Goiás Association to Combat Cancer, Goiânia, Brazil, [3].C. Camargo Cancer Center, São Paulo, Brazil, [4]ACCamargo Center, São Paulo, Brazil, [5]Institute Federal of Goiás, Goiânia, Brazil.

Helicobacter pylori infection is related to gastric and extragastric diseases. Diet may play an important role in the development of this infection. The aim of this study was to evaluate the relationship between dietary habits and *H. pylori* infection. A cross-sectional examination of the associations between dietary patterns and *H. pylori* infection in dyspeptic patients seen at a reference hospital in the Midwest of Brazil was performed. Ninety-two questionnaires from patients undergoing upper digestive endoscopy were analyzed. *H. pylori* infection was confirmed by histopathological examination. Categorical variables were compared using Pearson's chi-square test, with a 5% significance level.
Exploratory Factor Analysis was performed for the tertiles of consumption (g/day). The KMO values (> 0.50) showed that the groups were amenable to factoring, as well as the sphericity assumption verified by Bartlett's test ($p < 0.001$). The variance explained by the model, distributed over 5 factors, for negative and positive *H. pylori* was 54.76% and 51.17%, respectively. The prevalence of *H. pylori* infection was 51.09% (47/92). Among infected patients, the mean age was 46.31 ± 14.60 and 59.57% (28/47) were women. There was no difference between the groups and the variables sex ($p = 0.163$), age ($p = 0.861$), marital status ($p = 0.542$), ethnicity ($p = 0.717$), education ($p = 0.592$) and body mass index ($p = 0.085$). The dietary pattern for both groups showed a predilection for ultra-processed foods such as sausages, sweets, and pizza. It was not possible to associate dietary pattern with *H. pylori* infection.

G.A.S. Soares: None. F.A.D. Moraes: None. A.F.P.L. Ramos: None. G.R. de Sousa: None. L.G. Silveira: None. L.L.D. Silva: None. A.M. Brito: None. A.A. Fernandes: None. G.A. Fernandes: None. M.P. Curado: None. M.S. Barbosa: None. S.B. Santiago: None.

P05.06

DIFFERENCES IN MANAGEMENT OF *HELICOBACTER PYLORI* INFECTION: AN OBSERVATIONAL STUDY

R. NTOUNDA[1,2], *G. RASSCHAERT*[3],
BELGIAN HELICOBACTER PYLORI AND MICROBIOTA STUDY GROUP
[1]chu saint pierre/ ULB/ bruxelles, bruxelles, Belgium, [2]Belgian *Helicobacter pylori* and Microbiota Study Group, Bruxelles, Belgium, [3]Belgian *Helicobacter pylori* and Microbiota Study Group, bruxelles, Belgium.

Background: Despite multiple recommendations, management of *Helicobacter pylori* (Hp) infection and eradication rates remain highly variable across countries and sometimes within the same region.Purpose: Obtain insight in physicians management of Hp infection, through a questionnaire, as compared to existing guidelines.

Materials and methods: Our questionnaire, based on the international recommendations on the management of Hp infection, was submitted anonymously to two major scientific associations of physicians: mainly Belgian (both French-speaking and Dutch-speaking) and African (French-speaking).
Results: 138 practitioners responded to the questionnaire, including 95 in the Belgian group and 43 in the African group. The Belgian group has two subgroups: Dutch-speaking (60) and French-speaking (35). Throughout thirty questions studied, the difference between the Belgian and African group is observed only in the use of non-invasive tests (p=0.013), in eradication control (p=0.004) and in the search for Hp infection before bariatric surgery (p<0.05). On the one hand, there is no significant difference in the two Belgian linguistic subgroups. Only 55.8% is interested in therapeutic success rate. On the other hand, only 31.9% of practitioners have an overall therapeutic success > 80%. In addition, overall scores on knowledge of recommendations are often questionable.
Conclusion: There are no significant discrepancies in the management of Hp infection between Belgian and African practitioners despite the difference in diagnostic and therapeutic means. There is an important gap in several aspects between international recommendations and daily practice. Considerable effort in popularizing the guidelines seems to be useful.

R. Ntounda: None. G. Rasschaert: None.

P05.07

HELICOBACTER PYLORI IS ASSOCIATED WITH UNINVESTIGATED DYSPEPSIA IN INHABITANTS OF THE EASTERN SIBERIA ADMINISTRATIVE CENTER

V. V. TSUKANOV*, A. V. VASYUTIN, E. V. KASPAROV, J. L. TONKIKH*
Federal Research Centre “Krasnoyarsk Science Centre” of the Siberian Branch of Russian Academy of Science, “Scientific Research Institute of medical problems of the North”, Krasnoyarsk, Russian Federation.

Aim: To study the relationship between *Helicobacter pylori* infection and uninvestigated dyspepsia in the Krasnoyarsk city.
Methods: 1382 people (684 men and 698 women; average age 40.6 years) living in Krasnoyarsk were selected and examined by the random sampling method. Dyspepsia was diagnosed according to the Rome IV criteria [Stanghellini V. et al., 2016]. Epigastric pain syndrome (EBS) and postprandial distress syndrome (PDS) were distinguished. Instrumental methods for the dyspepsia diagnosis were not used. All patients were tested for *Helicobacter pylori* antibodies in blood serum by enzyme immunoassay method using Biohit (Finland) test system.
Results: The prevalence of uninvestigated dyspepsia was 21.1% (20.6% in men and 21.6% in women; OR=0.94; CI 0.73-1.22; p=0.69). EBS was determined in 5.9% of patients (8.2% men and 3.7% women; OR=2.28; CI 1.42-3.67; p<0.001), PDS - in 15.2% individuals (12.4% men and 17.9% women; OR=0.65; CI 0.48-0.88; p=0.006). The *Helicobacter pylori* infection prevalence was 82.8% (82.2% in men and 83.4% in women; OR=0.92; CI 0.69-1.21; p=0.6). In patients with *Helicobacter pylori* infection dyspepsia in general (22.3% versus 15.5%; OR=1.54; CI 1.06-2.25; p=0.03) and EBS (6.6% versus 2.5%; OR=2.56; CI 1.14-5.78; p=0.02) were registered more often than in individuals without *Helicobacter pylori*. There was no association of *Helicobacter pylori* with PDS (15.6% versus 13.0%; p=0.35). Risk factors for uninvestigated dyspepsia were tobacco smoking, alcohol abuse, age over 40, use of nonsteroidal anti-inflammatory drugs and aspirin.
Conclusion: We found an association of *Helicobacter pylori* infection with dyspepsia, mainly due to EBS, in the population of Krasnoyarsk city.

V.V. Tsukanov: None. A.V. Vasyutin: None. E.V. Kasparov: None. J.L. Tonkikh: None.

P05.08

RELATIONSHIP BETWEEN FOOD HABITS AND THE DEVELOPMENT OF GASTRIC ADENOCARCINOMA

G. R. DE SOUSA[1], A. F. P. L. RAMOS[1], G. A. S. SOARES[1], F. A. D. MORAES[1], L. L. D. SILVA[1], D. C. CAITANO[1], L. G. SILVEIRA[1], A. M. BRITO[2], A. A. FERNANDES[3], G. A. FERNANDES[3], M. P. CURADO[3], ***M. S. BARBOSA***[1]
[1]University Federal of Goiás, Goiânia, Brazil, [2]Goiás Association to Combat Cancer, Goiânia, Brazil, [3]AC-Camargo Center, São Paulo, Brazil.

Gastric cancer (CG) is the sixth most diagnosed neoplasm in the world and the third with the highest mortality rate. Approximately 80% of the factors that influence the development of CG are due to lifestyle and nutritional factors, including the frequent consumption of ultra-processed foods. The aim of this study was to investigate the food consumption of individuals with GC. This is a hospital-based case-control study, carried out from 2019 to 2021, paired by sex and age. Questionnaires from 75 patients with GC (C-16) confirmed by histopathological examination (cases), 161 dyspeptics (control 1) and 139 healthy (control 2) were analyzed. Exploratory Factor Analysis was performed for consumption tertiles (g / day). The KMO values (> 0.50) showed that the groups were subject to factorization, as well as the assumption of sphericity verified by the Bartlett test (p<0.001).
The variance explained by the model, distributed in 5 factors, for cases, control 1 and control 2 was 51.64%, 46.68% and 45.46%. The dietary pattern of patients with CG and dyspeptics showed a predilection for ultra-processed foods such as sausages, pizza, sweet drinks, among others. For healthy patients, factor 1 was composed mostly of unprocessed foods, such as vegetables, cruciferous, tubers and fruits. Minimally processed food distribution was observed among healthy patients. The predominant consumption of ultra-processed foods by CG and dyspeptic patients shows a possible relationship between these foods and CG and other gastric diseases.

G.R. de Sousa: None. A.F.P.L. Ramos: None. G.A.S. Soares: None. F.A.D. Moraes: None. L.L.D. Silva: None. D.C. Caitano: None. L.G. Silveira: None. A.A. Fernandes: None. G.A. Fernandes: None. M.P. Curado: None. M.S. Barbosa: None. A.M. Brito: None.

P05.09

GASTRIC CANCER EARLY MORTALITY: A BRAZILIAN COHORT STUDY

T. TIENGO*, G. A. FERNANDES, P. E. ARANTES, M. P. CURADO*
AC Camargo Cancer Center, São Paulo, Brazil.

Objective: determine 1 year survival and prognostic factors related to early mortality in a cohort of patients with gastric adenocarcinoma (GA) conducted at ACCamargo Cancer Center, São Paulo, Brazil.
Methodology: prospective cohort with GA patients confirmed by histology (C16, M-8140) diagnosed between February 2016 and July 2019. Survival curves were estimated with Kaplan-Meier estimator. We used Cox proportional hazards model to calculate Hazard Ratio (HR) and 95% confidence interval. Statistical significance was 5% for all tests.
Results: 214 cases were analyzed, after one year follow-up 173 (80.8%) survived and 41 (19.2%) died. From these 41 patients 65.9% (27/41) are male, 53.7% (22/41) <64 years, 53.7% (22/41) smokers and ex-smokers, 58.5% (24/41) do not consume alcohol and 10.8% (4/41) *Helicobacter pylori* positive, 63.4% (26/41) have comorbidities being 36.6% (15/41) peripheral vascular disease and 26.8% (11/41) diabetes. No cardia tumor corresponds to 65.9% (27/41), Lauren's diffuse type 51.2% (21/41) and 85.4% (35/41) are advanced clinical stage (III/IV). One year survival was 80.8%, the variables that showed a difference in survival curves with lower estimation were advanced clinical stage (70.6%), over 65 years (67.2%), diabetes (64.5%) and cerebrovascular disease (33.3%). Main prognostic factors are advanced clinical stage (HR 5.80, 95%CI: 2.42-13.8), age ≥65 years (HR 4.47, 95%CI: 1.82-10.95), presence of cerebrovascular disease (HR 2.75, 95%CI: 1.46-5.18) and diabetes (HR 2.27, 95%CI: 1.13-4.57) at diagnosis.

Conclusion: Keynote for early detection is mass screening, however esophagogastroduodenoscopy is invasive and expensive, efforts should be done to direct screening to high-risk population as people above 65 years.

T. Tiengo: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Modest; Group of Epidemiologics and Statistics on Cancer, AC Camargo Cancer Center, São Paulo, Brasil, Fundação CAPES. G.A. Fernandes: A. Employment (full or part-time); Significant; Group of Epidemiologics and Statistics on Cancer, AC Camargo Cancer Center, São Paulo, Brasil. P.E. Arantes: None. M.P. Curado: A. Employment (full or part-time); Significant; Group of Epidemiologics and Statistics on Cancer, AC Camargo Cancer Center, São Paulo, Brasil.

P05.10

PREVALENCE OF *HELICOBACTER PYLORI* CAGA, VACA, OIPA AND ICEA GENOTYPES IN RUSSIAN PATIENTS WITH GASTRODUODENAL DISEASES

***A. V. SVARVAL**, D. STARKOVA, R. FERMAN*
Pasteur Institute, Saint Petersburg, Russian Federation.

There is a very limited number of studies investigated the genetic diversity of *H. pylori* in Russia.
Aims: Based on the assessment of virulence-associated *cagA, iceA, oipA,* and *vacA* genes, we aimed to determine *H. pylori* genotypes regarded as molecular markers in *H. pylori* clinical isolates in St. Petersburg.
Materials and Methods: Using PCR for the detection of *cagA*, *oipA, iceA* genes and *vacA* s-, m-,i- allelic variants, we analyzed a convenience sample of 58 *H. pylori* isolates cultured from biopsies taken during endoscopy from patients with chronic gastritis (G, n=37), duodenal ulcer (DU, n=19), and gastric cancer (GC, n=3).
Results: The 38 (65.5%) of the 58 *H. pylori* isolates were *cagA*-positive, 36 (62.1%) - *oipA*-positive. The proportions of *cagA*+ isolates differed in patients with G (54.1%) and DU (78.9%), (p=0.06). The *iceA1* genotype was detected in 47.4% of patients with DU, the *iceA2* - in 43.2% of patients with G (p>0.05). The *vacA* s1 allele was significantly dominant in patients with DU (94.7%) rather than with G (64.9%) (p=0.01). All *vacA* s2 strains were *cagA*-negative and had the m2 allele. No significant difference in *vacA* m1/m2, *vacA* i1/i2, *iceA1/A2* alleles and *oipA* status was found in isolates from G and DU groups. All three isolates from patients with GC carried the *cagA*+/*oipA*+/*vacA*s1/m1/i1 genotype.
Conclusion: We have determined predominant genotypes in the *H. pylori* population in North-West Russia. The association between *vacA*s1 genotype of the pathogen and clinical manifestations of *H. pylori* infection has been established in our study.

A.V. Svarval: None. D. Starkova: None. R. Ferman: None.

ELECTRONIC POSTER ROUND 6

Microbiology and genomics of Helicobacter

P06.01

PHENOTYPIC, MOLECULAR, AND WHOLE GENOME CHARACTERIZATION OF ANTIBIOTIC RESISTANCE IN ENTEROHEPATIC *HELICOBACTER* SPECIES

***A. MANNION**, Z. SHEN, J. DZINK-FOX, Y. FENG, J. G. FOX*
Massachusetts Institute of Technology, Cambridge, MA, United States.

Enterohepatic *Helicobacter* species (EHS) are Gram-negative, microaerophilic, spiral-shaped bacteria that, unlike gastric helicobacters like *H. pylori*, colonize the lower bowel and hepatobiliary tract of humans, mammals, birds, and reptiles. Seven EHS (*H. bilis*, *H. canadensis*, *H. canis*, *H. cinaedi*, *H. fennelliae*, *H. pullorum*, and *H. winghamensis*) have been isolated from healthy humans and patients with diarrhea, gas-

troenteritis, bacteremia, fever, cholecystitis, and proctocolitis. These human-associated EHS also infect animal reservoirs including chickens, rodents, cats, dogs, sheep, and non-human primates, emphasizing zoonotic transmission. Unlike *H. pylori*, antibiotic treatment paradigms and potential of antibiotic-resistant EHS strains have not been fully described. Therefore, the purpose of this investigation was to characterize in 21 strains of human-associated EHS antibiotic susceptibility profiles and resistance mechanisms to metronidazole (MTZ), clarithromycin (CLR), ciprofloxacin (CIP), rifampicin (RIF), tetracycline (TET), and amoxicillin (AMX). We found 5/21, 9/21, 11/21, 8/21, 16/21, and 14/21 strains were resistant to MTZ, CLR, CIP, RIF, TET, and AMX, respectively, using the agar dilution assay and E-test.
PCR and whole genome sequence analysis of select EHS for mutations in *H. pylori* resistance-associated genes were identified for and significantly associated with CLR, CIP, RIF, TET, and AMX resistance phenotypes as well as homologs to antibiotic efflux pumps. Mutations and/or resistance genes were also present in 67 additionally published genomes of human-associated EHS (not phenotypically profiled). These finding show EHS exhibit antibiotic resistance and elucidate potential genetic mechanisms of these phenotypes. Future surveillance and mechanistic studies will enable development of treatment paradigms for eradicating EHS infection in patients.

A. Mannion: None. Z. Shen: None. J. Dzink-Fox: None. Y. Feng: None. J.G. Fox: None.

P06.02

DETECTION & GENOTYPING OF *H. PYLORI* IN ENVIRONMENTAL SAMPLES

I. HORTELANO MARTIN
Research Institute of Water Engineering and Environment (IIAMA), Valencia, Spain.

Background: Among all emerging waterborne pathogens, *Helicobacter pylori* is one of the most disturbing ones, as it is directly associated with gastric illness and hepatobiliary and gastric cancer. Although the organism is present in water, its prevalence and epidemiological aspects are unclear. Therefore, the study of virulence and resistance markers of *H. pylori* is necessary for its identification and epidemiological characterization in different samples.
Objectives: The aim of this work is the optimization of the PCR method to detect *H. pylori* virulence and resistance to metronidazole and amoxicillin markers in environmental samples.Methods: Reference strains belonging to both, Helicobacter and Arcobacter genera, were used to establish the specific PCR conditions to identify the virulence genotypes (vacA s1, vacA m1, *cagA*) and the resistance genes (*rdx*A and *pbp*1A) of *H. pylori*. Once the PCR conditions were optimized, a total of 37 environmental samples were analysed: 11 wastewater, 2 drinking water, 2 irrigation water and 23 biofilms.
Results: A total of 5 wastewater and 1 drinking water samples were positive for *cag*A gene, and 4 wastewater samples yielded positive for *vac*As1. VacAm1 was identified in one drinking water and 2 irrigation water sample. Two biofilm samples presented *vacAm*1 gene, and other two resulted positive for the resistance gene *pbp*1A. Our results demonstrate the presence in different water samples of *H. pylori* strains which can pose a special threat to human health due to their resistance to the antibiotic treatment and/or their virulence.

I. Hortelano Martin: None.

P06.03

GENETIC DIVERSITY OF *HELICOBACTER PYLORI* STRAINS ISOLATED FROM SINGLE PATIENTS USING MULTILOCUS SEQUENCE TYPING (MLST)

P. SANIEE[1], *B. PASCOE*[2], *F. SIAVOSHI*[3], *F. ATTARIAN*[1], *A. H. GHODRATI*[1], *R. BAHRAMI*[1]
[1]Shahid Beheshti University, Tehran, Iran, Islamic Republic of, [2]University of Bath, Claverton Down, Bath, United Kingdom, [3]University of Tehran, Tehran, Iran, Islamic Republic of.

Introduction: It is well known that high genetic diversity is a hallmark of *H. pylori* which could have a great impact on clinical outcomes. The aim of this study was to determine the intra-patient variation of *H. pylori* strains based on multilocus sequencing typing analysis of seven housekeeping genes.

Methods: Four single colonies were isolated from gastric biopsies cultures of 10 *H. pylori*-positive patients and subjected to DNA extraction and whole genomes sequencing. The assembled genomes were recorded on the MLST website (https://cge.cbs.dtu. dk//services/MLST/), determining the allele number assigned to each locus as well as the sequence type for each isolate.
Results: In two patients, four *H. pylori* isolates had identical allele for all seven loci and in the remaining patients, *H. pylori* isolates had different alleles at least in one locus. Searching the combination of MLST loci showed that in eight patients, all *H. pylori* strains had unique alleles and sequence types which were not recorded previously in the MLST database. In one patient, one isolate and in one patient, two isolates had six novel alleles and only the locus efp was 100 % identical with efp -1497 in *H. pylori* MLST database.
Discussion: in this study multiple novel *H. pylori* sequence types were identified. In most of the patients, *H. pylori* isolates exhibit diverse genotypes. Co-existence of *H. pylori* isolates with unique genetic properties suggest complex selective forces within the stomach during infection that require further studies.

P. Saniee: None. B. Pascoe: None. F. Siavoshi: None. F. Attarian: None. A.H. Ghodrati: None. R. Bahrami: None.

P06.04

POTENTIAL ROLE OF SINGLE NUCLEOTIDE POLYMORPHISM OF gluP AND cgt GENES IN *H. PYLORI* BIOFILM FORMATION

K. A. FAUZIA[1,2,3], *H. AFTAB*[4], *Y. YAMAOKA*[1]
[1]Oita University Faculty of Medicine, Yufu, Oita, Japan, [2]Institute of Tropical Disease, Universitas Airlangga, Surabaya, Indonesia, [3]Department of Public Health and Preventive Medicine, Surabaya, Indonesia, [4]Dhaka Medical College, Dhaka, Bangladesh.

Biofilm formation in *H. pylori* has been associated with the worsening of antibiotic resistance. Biofilm consists of protein and polysaccharide hence, genes related to polysaccharides regulation were known to be related to biofilm formation. Among them are *gluP (glucose/galactose* transporter) and *cgt (*Cholesterol-a-glucosyltransferase). However, the absence of these genes was rare and the single nucleotide polymorphism (SNPs) is more common in the clinical or environmental strains. We investigated the association of the SNPs of *gluP* and *cgt* genes in the biofilm formation.
For the phenotype, we measured the biofilm quantity of 56 *H. pylori* clinical isolates by crystal violet method. Whole-genome sequencing was performed by Illumina miseq with 2x300 reads and the results were used as the input for *ariba* pipeline. Among the 56 isolates, 19.4 % of them were strong biofilm former and 81.6% were weak biofilm former with the cutoff optical density 0.2. Both *gluP* and *cgt genes* were present in 100% of isolates. Ariba pipeline results showed 78 and 66 SNPs for *gluP* and *cgt,* respectively. Among those SNPs, significant association with strong biofilm formation in locus T85S of *gluP* and locus V34A of *cgt* (P-value 0.032 and 0.02, respectively). Further in silico protein modeling showed a destabilizing effect in both proteins by reducing the rigidity which important for the transporting efficiency. This could be the early step to understand the mechanism of biofilm formation.

K.A. Fauzia: None. Y. Yamaoka: None. H. Aftab: None.

P06.05

PEPTIDOGLYCAN AS A MARKER FOR ISOLATION OF ENDOSYMBIOTIC *HELICOBACTER PYLORI* AND *STAPHYLOCOCCUS* FROM YEAST

S. HEYDARI[1], *R. MALEKZADEH*[2], *F. SIAVOSHI*[1], *A. SARRAFNEJAD*[3]
[1]Department of Microbiology, School of Biology, University College of Sciences, University of Tehran, Tehran, Iran, Islamic Republic of, [2]Digestive Disease Research Institute, Tehran University of Medical Sciences, Tehran, Iran, Islamic Republic of, [3]Department of Immunology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran, Islamic Republic of.

Background/Aims: In this study, fluorescent *in situ* hybridization (FISH) was used for demonstrating coexistence of *H. pylori* and *Staphylococcus* inside one gastric *Candida* yeast. Peptidoglycan, as the surface marker of bacteria, was targeted for isolation of intracellular bacteria by immunomagnetic separation (IMS).
Methods: FISH was performed with Cy5-labeled *H. pylori*- and Cy3-labeled *Staphylococcus*-specific probes. Anti-peptidoglycan monoclonal antibody was conjugated with FITC and used for detection of peptidoglycan inside yeast cells by direct immunofluorescence. Tosylactivated magnetic beads were coated with anti-peptidoglycan antibody and used for separation of bacteria from disrupted yeasts. Beads were separated by magnet and observed with scanning electron microscope (SEM). Finally bead-bound bacteria were identified by amplification and sequencing of 16S rDNA.
Results: Simultaneous FISH signals produced in the yeast cells demonstrated coexistence of intracellular *H. pylori* and *Staphylococcus*. Observation of fluorescence green spots also showed interaction of FITC-labeled anti-peptidoglycan antibody with peptidoglycan of intracellular bacteria. Interestingly, there were many peptidoglycan particles outside the yeast cells. Examination of beads with SEM demonstrated bead-bound cocci and short bacilli. Sequencing of amplified products from bead-bound bacteria with the size of 521 bp and 750 bp showed 99% similarity to several strains of *H. pylori* and *Staphylococcus*, respectively.
Conclusions: Our results showed occurrence of peptidoglycan as a marker for existence of prokaryotic cells inside yeast. FISH and IMS results confirmed coexistence of intracellular *H. pylori* and *Staphylococcus* as yeast's microbiome. Furthermore, observation of peptidoglycan particles outside, may reveal that yeast controls the abundance of intracellular bacteria by degrading and exporting peptidoglycan.

S. Heydari: None. R. Malekzadeh: None. F. Siavoshi: None. A. Sarrafnejad: None.

P06.06

PROPHAGE ELEMENTS IN GREEK *HELICOBACTER PYLORI* CLINICAL ISOLATES

*M. KARAPANOU[1,2], **B. MARTINEZ-GONZALEZ**[1], T. KARAMITROS[3], Y. KARAYIANNIS[1], E. KONTIZAS[1], A. F. MENTIS[1], P. KOLLIA[2], D. N. SGOURAS[1]*
[1]Laboratory of Medical Microbiology, Hellenic Pasteur Institute, Athens, Greece, [2]Department of Genetics and Biotechnology, Faculty of Biology, School of Science, National and Kapodistrian University of Athens, Athens, Greece, [3]Bioinformatics and Applied Genomics Unit, Hellenic Pasteur Institute, Athens, Greece.

Helicobacter pylori (*Hp*) is a genetically diverse and highly recombining pathogen coevolving with its human host. Acquisition of prophage has been suggested to influence the evolution of most bacterial species. Next generation sequencing (NGS) technology has aided in the identification of prophage-like elements in genomes of *Hp* strains. We sequenced the genome of 37 *Hp* isolates using the IonTorrent S5 platform. NGS data was generated as short reads and sequences were assembled *de novo*. The assembled contigs were processed using PHASTER web server for predicting the presence of prophage regions. Additionally, BLAST search of predicted prophage sequences found in *Hp* strains, was performed. Twenty-eight prophage-like elements were identified in 40.5% (15/37) of *Hp* genome analyzed. The PHASTER screening revealed the presence of phiHP33, KHP30 and 1961P phage particles and prophage flanking sites (attL, attR) in 8 *Hp* strains. BLAST analysis confirmed the presence of identical phage sequences in 7 out of 8 strains screened by PHASTER, but also determined other integrase and holin genes in another 7 strains with high identity, bit-score and low mismatches. Integrase genes were found in 93.3% (14/15) while both integrase and holin genes were present in 33.3% (5/15) of the *Hp* strains analyzed. Notably, possession of prophage Pt1918U and KHP40 was more frequent in the samples studied. Most of the strains carrying prophage were CagA- and VacA-positive and presented resistance to at least one antibiotic. Continuous studies on characterization and validation of prophage genes should be performed to understand their involvement in *Hp* genome plasticity.

M. Karapanou: None. B. Martinez-Gonzalez: None. T. Karamitros: None. Y. Karayiannis: None. E. Kontizas: None. A.F. Mentis: None. P. Kollia: None. D.N. Sgouras: None.

P06.07

HELICOBACTER PYLORI 'S TYPE 4 SECRETION SYSTEMS AS A GASTRODUODENAL DISEASES MARKER

B. HOANG PHUC
Oita University, Yufu, Japan.

The type 4 secretion system of the integrating and conjugative elements *(tfs* ICE) of *Helicobacter pylori* and its clinical association with the *cag* pathogenicity island (cagPAI) have not yet been well-investigated. In this study, a total of 136 Vietnamese patient *H. pylori* samples (46 duodenal ulcer (DU), 51 non-cardia gastric cancer (NCGC), 39 chronic gastritis (CG)) were fully sequenced using next-generation sequencing and assembled into contigs. *tfs3, tfs4,* and cagPAI genes were compared with the public database. Most (94%) *H. pylori* strains possessed a complete cagPAI, which was the greatest risk factor for clinical outcomes, while the prevalences of *tfs3* and *tfs4* were 45% and 77%, respectively.
Complete *tfs3* and *tfs4* were found in 18.3% and 17.6% of strains, respectively. The prevalence of *H. pylori* strains with complete *tfs3* ICE in DU patients was significantly higher than that in NCGC patients (30.4% vs 11.7%, $P < 0.05$). In addition, the prevalence of strains with complete *tfs3* ICE and cagPAI was significantly higher in DU patients than that in NCGC (28.4% vs 9.8%, $P = 0.038$) and CG patients (28.2% vs 7.7%, $P = 0.024$). cagPAI and complete *tfs3* increased the risk of DU compared to NCGC (OR = 3.56, 95%CI: 1.1-14.1, $P = 0.038$) and CG (OR = 4.64, 95%CI: 1.1-27.6, $P = 0.024$). In summary, the acquisition of *tfs3/4* ICE was common in *H. pylori* strains in patients with gastroduodenal disease in Vietnam, and the complete cluster of *tfs3* ICE was a reliable marker for the severity of disease in the *H. pylori* infected population.

B. Hoang Phuc: None.

P06.09

GENETIC DIVERSITY OF *vacA* VARIABLE *I* , *D* AND *C* REGIONS IN *HELICOBACTER PYLORI* ISOLATES FROM INDIVIDUAL HOSTS

P. SANIEE, T. TAGHINEJAD
Shahid Beheshti University, Tehran, Iran, Islamic Republic of.

Introduction: *H. pylori* strains are very heterogeneous and show high genetic diversity within virulence genes between different host as well as in a single host. vacuolating cytotoxin A (*vacA*) which is correlated with increased risk of disease comprises several polymorphic regions; signal (*s*), middle (*m*), intermediate (*i*), deletion (*d*) and recently identified region termed *c* and the role of this diversity in the bacterial pathogenesis is not fully understood. In this study, the diversity of i, c and d regions of the *vacA* gene was investigated in *H. pylori* isolates from 14 individual patients.
Methods: Gastric biopsies from 14 *H. pylori*-positive dyspeptic patients were cultured on brucella blood agar and incubated under microaerobic conditions. Four single colonies were obtained from each biopsy subculture and subjected to DNA extraction. Amplification of *i, d* and *c vacA* alleles was performed using appropriate primers.
Results: Single colonies of two patients showed no variation in *vacA* alleles. Out of the remaining 12 patients, 10 patients had two and two patients had three different *vacA* genotypes. Totally, 15 different *vacA* genotypes were observed in *H. pylori* isolates from 14 patients. *VacA c1i1d1* was the most common genotype in *H. pylori* isolates.
Discussion: Results of this study showed differences in *vacA* variable i, d and c regions as a representative of heterogeneity in *H. pylori* isolates that infect an individual patient. Future studies on larger number of patients in different disease groups could elucidate any correlation between *vacA* genotype and clinical outcomes.

P. Saniee: None. T. Taghinejad: None.

ELECTRONIC POSTER ROUND 7

Helicobacter and extragastroduodenal disease

P07.01

MUCUS-DEGRADING MICROBIOTA AND PROINFLAMMATORY T-CELL RESPONSES UNDERLIE *HELICOBACTER PYLORI* INDUCED COLON CARCINOGENESIS

***A. RALSER**, A. DIETL, A. WANISCH, R. MEJÍAS-LUQUE, M. GERHARD*
Institute of Medical Microbiology, Immunology and Hygiene, Munich, Germany.

Helicobacter pylori infection affects more than half of the world's population and although this organism colonizes the stomach, chronic infection is also associated with extragastric diseases. *H. pylori* positive individuals harbor a nearly 2-fold increased risk for development of colorectal cancer. However, the underlying mechanisms that confer this observed risk are unclear. Here, we explored the effect of *H. pylori* infection on the intestinal and colonic immune responses, as well as on carcinogenic signaling in $Apc^{+/min}$ and $Apc^{+/1638N}$ mice. Moreover, we assessed the impact of infection on the gut microbiota and validated our findings in a cohort of infected patients.
We found that *H. pylori* infection promotes tumor development and induces *H. pylori* specific proinflammatory T-cell responses. This was accompanied by a reduction of regulatory T-cells in intestine and colon lamina propria. We also observed a loss of mucus producing goblet cells, which was related to increased presence of mucus-degrading microbiota upon *H. pylori* infection. Our results define distant effects of *H. pylori* on the intestinal and colonic immune response and on the microbiota as the dominant mechanisms involved in *H. pylori* driven colorectal carcinogenesis.

A. Ralser: None. R. Mejías-Luque: None. M. Gerhard: None. A. Dietl: None. A. Wanisch: None.

P07.02

EXPLORING THE BINDING MECHANISMS OF *HELICOBACTER PYLORI* TO COLON EPITHELIAL CELLS AND INDUCED DOWNSTREAM SIGNALING

***A. RALSER**, Y. HAMWAY, K. TAXAUER, M. GERHARD, R. MEJÍAS-LUQUE*
Institute of Medical Microbiology, Immunology and Hygiene, Munich, Germany.

Helicobacter pylori colonizes the stomach mucosa and is the leading cause for gastric cancer development. Chronic infection has been associated with a variety of extragastric diseases and emerging studies support an increased risk for colorectal cancer development in *H. pylori* positive individuals. The attachment of the bacteria to host cells is fundamental for *H. pylori* induced pathogenesis, enabling translocation of effector molecules, chronic inflammatory response to infection and subsequent downstream signaling. Here, we aim to characterize the binding of *H. pylori* to colon epithelial cells and to identify virulence factors involved, as well as signaling pathways induced.
We found that *H. pylori* infection alters the expression of CEACAM receptors on colon cancer cells, and that *H. pylori* is able to bind to colon cells as well as primary epithelial cells. Furthermore, we detected CagA translocation as well as activation of NF-kB signaling and IL-8 secretion upon *H. pylori* infection in colon cells. Our findings show that *H. pylori* can successfully bind to colon cells and is able to induce inflammation associated signaling pathways. These results indicate a possible direct effect of *H. pylori* in colorectal carcinogenesis.

A. Ralser: None. R. Mejías-Luque: None. M. Gerhard: None. Y. Hamway: None. K. Taxauer: None.

P07.03

CIRCULATING GHRELIN DECREASE FOLLOWING *HELICOBACTER PYLORI* ERADICATION

P. MANTERO[1], *L. MARCHESI OLID*[2], *C. GIACOMANTONE*[3], *R. E. CORTI*[3], *A. M. CABANNE*[4], *M. A. JANJETIC*[1,2,5], *C. G. GOLDMAN*[1,5]

[1]Universidad de Buenos Aires, Facultad de Farmacia y Bioquímica, Cátedra de Física, Buenos Aires, Argentina, [2]Universidad de Buenos Aires, Facultad de Medicina, Escuela de Nutrición, Buenos Aires, Argentina, [3]Hospital de Gastroenterología "Dr. Carlos Bonorino Udaondo", Sección Esófago-Estómago, Buenos Aires, Argentina, [4]Hospital de Gastroenterología "Dr. Carlos Bonorino Udaondo", Unidad Patología, Buenos Aires, Argentina, [5]Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires, Argentina.

Ghrelin, an appetite modulating peptide mainly produced in the gastric mucosa, has been reported lower in *Helicobacter pylori* infected subjects. This longitudinal pre-post study aimed to evaluate the effect of *H. pylori* eradication on circulating ghrelin, gastric histopathology, appetite and nutritional status. Histopathology and *H. pylori* diagnosis were evaluated from gastric biopsies of dyspeptic adults. Weight and height were assessed. Appetite and nutrient intake were determined using validated tools. Ghrelin concentration was measured by ELISA. *H. pylori* positive patients received eradication therapy and returned 12 weeks later for re-evaluation. Chi-squared, Mann-Whitney, Wilcoxon-Signed-Rank and Friedman tests were applied. *H. pylori* prevalence among 117 screened individuals (43.3±12.6y) was 68.4% (CI95% 59.5-76.1%).
Forty-seven patients returned for control: 28 (59.6%) successfully eradicated while 19 remained infected. Pathology decreased significantly after treatment in eradicated individuals, both in gastric antrum and corpus (p=0.0001), but did not in uneradicated patients (p=0.06 and p=0.41 respectively). Appetite and nutrient intake did not differ significantly after therapy in either group; however, body weight increased in both groups (p=0.02 and p=0.03). Serum ghrelin significantly decreased in eradicated patients [345.0pg/mL (IQR 373.0-517.8) before, 298.5pg/mL (IQR 251.0-383.5) after; p=0.0007] but remained unchanged in those infected (p=0.11). Our results showed a statistically significant decrease in circulating ghrelin after *H. pylori* eradication, which may be related to the recovery of the gastric mucosa. It should be investigated whether weight gain, without food intake and appetite variation, could be related to an alteration of microbiota composition after completion of the eradication treatment regardless of its effectiveness.

P. Mantero: None. L. Marchesi Olid: None. C. Giacomantone: None. R.E. Corti: None. A.M. Cabanne: None. M.A. Janjetic: None. C.G. Goldman: None.

P07.04

AUTOIMMUNE DISEASE DID NOT RESULT IN A HIGHER INCIDENCE OF PERNICIOUS ANEMIA AMONG A COHORT OF 94 PATIENTS WITH ACTIVE *H. PYLORI* INFECTION PRESENTING TO A RHEUMATOLOGY CLINIC

M. LOVY
Desert Oasis Healthcare, Palm Springs, CA, United States.

Background: Based on various cohort studies an association of *H. pylori* and PA has been proposed. This study describes the characteristics of a cohort of 22 patients diagnosed with PA at the time of active *H. pylori* infection in a rheumatology clinic.
Methods: A retrospective chart review was conducted of patients who had gastrointestinal complaints and were subsequently diagnosed with *H. pylori* infection based on a positive urea breath test (+UBT).
Results: There were 94 patients with +UBT. Diagnosis in patients with autoimmune disease, Group 1, included rheumatoid arthritis-28, lupus-5, ankylosing spondilitis-3, psoriatic arthirits-3, CREST-2, Hashimoto's thyroiditis-2, MCTD-1, uveiitis-1, Sjogren's-1, and granulomatosis with polyangiitis-1. Diagnosis in the non-inflammatory group, Group 2, included fracture-15, osteoarthritis-12, osteoporosis-10,

pain-7, thrombocytopenia-1, panniculitis-1, and mastitis-1. Twenty-two patients, 23%, were diagnosed with PA based on low vitamin B-12 levels and presence of either anti-parietal cell (APCA) or intrinsic factor (IF) antibodies, 13 in Group 1 and 9 in Group 2. Two patients in Group 2 had vitamin B-12 levels below 200 pg/ml and negative APCA and IF antibodies. The two groups of patients did not differ in age, gender, racial distribution, incidence of PA, p-value=0.303, or other clinical characteristics.
Conclusion: The high incidence of PA, 23%, observed in this cohort of *H. pylori* infected patients supports the relationship between *H. pylori* and PA. However a higher incidence of PA among patients with autoimmune disease was not seen as might be expected if *H. pylori* acted in concert with underlying genetic predisposition.

M. Lovy: None.

P07.05

HELICOBACTER PYLORI INFECTION, MONOCLONAL GAMMOPATHY OF UNCERTAIN SIGNIFICANCE, AND AUTOIMMUNE DISEASE IN A COHORT OF 150 PATIENTS WITH PERNICIOUS ANEMIA

***M. LOVY**, D. AGUIRRE VEGA, C. ESCOBAR*
Desert Oasis Healthcare, Palm Springs, CA, United States.

Purpose: The contribution of *Helicobacter pylori* (*H. pylori*), plasma cell dyscrasias and other autoimmune disease (AUD) to pernicious anemia (PA) has led to an appreciation of a more varied presentation of the disease. The purpose of this study is to document the spectrum of disease manifest in a cohort of patients diagnosed with PA.
Methods: A retrospective chart review of patients diagnosed with PA over a 10-year period was conducted. The diagnosis of PA was based on low vitamin B12 level and either intrinsic factor and/or anti-parietal cell antibodies.
Results: A total of 150 patients, 106 females and 44 males, aged 32-101years (mean 77.8), were diagnosed. Initial referral was based on acute fracture-41, rheumatoid arthritis-30, arthritis-30, osteoporosis-16, pain-15, AUD-9, systemic lupus erythematosus-7, psoriasis-2. Fifty patients were taking a protein pump inhibitor, 73 had heartburn, and 16 had a history of peptic ulcer disease. Urea breath test was administered to 74 patients with gastrointestinal complaints. Twelve out of 33 patients with AUD tested positive compared to 9 out of 40 without (p-value=.21). In addition to the group of patients with *H. pylori*, 19 had monoclonal gammopathy of uncertain significance, and 51 had AUD, with some overlap between groups.
Conclusion: In a group of 150 patients with PA, 21, or 14%, had *H. pylori* infection. The percentage of patients testing positive for *H. pylori* did not differ between those with and without autoimmune disease, suggesting that development of PA with *H. pylori* infection was independent of the presence of autoimmune disease.

M. Lovy: None. D. Aguirre Vega: None. C. Escobar: None.

P07.06

SCREENING AND DIAGNOSIS OF *HELICOBACTER PYLORI* INFECTION AND AUTOIMMUNE GASTRITIS IN PATIENTS WITH INFLAMMATORY BOWEL DISEASES

***M. KOVACHEVA-SLAVOVA**, H. VALKOV, T. ANGELOV, B. VLADIMIROV*
University Hospital Tsaritsa Ioanna-ISUL, Medical University of Sofia, Sofia, Bulgaria.

The role of *H. pylori (HP)* infection and atrophic gastritis in the development and progression of inflammatory bowel diseases (IBD) remains unknown.
The aim of this study was to screen patients with IBD for *HP*-infection and autoimmune gastritis (AIG), to assess gastric structure, function and the relationships between them all.
We used Montreal classification for IBD. We assessed levels of pepsinogen-I (PG-I), pepsinogen-II (PG-II), gastrin-17 (G-17), *HP* IgG; anti-parietal-cell antibodies (APCA) and anti-intrinsic-factor (AIF) using ELISA method.
The study included 56 persons (27 men, mean age 42.12±15.93years): 44 with IBD - 25 Crohn's disease (CD) and 19 Ulcerative colitis (UC) and 12 healthy controls. We observed lowest PG-I (p=0.026) and highest APCA

(*p*=0.015) in IBD. Age in CD correlated positively with G-17 and PG-I and negatively with AIF (*p*<0.05). 47.76% of IBD patients had AIG. 27.27% of IBD patients were positive for *HP*-infection. Moreover, 25% of patients had superficial *HP*-gastritis, and 6.82% had atrophic gastritis. Women with UC had more often *HP*-infection (*p*=0.025) and more severe gastric mucosal changes (*p*=0.058). We observed higher G-17 in CD patients with ileal localization (L1). Morphological changes, *HP*-infection and AIG did not correlate with IBD course; however, there was a tendency for protective effect of *HP* on IBD as titer of *HP* was higher in patients without IBD complications (*p*=0,045). By iron-deficiency anaemia in IBD, we observed lower PG-I, PG-II and G-17 and higher *HP*-titer. Further research is needed to evaluate the influence of *HP* on IBD course and when to treat the infection.

M. Kovacheva-Slavova: None. H. Valkov: None. T. Angelov: None. B. Vladimirov: None.

P07.07

PREVALENCE & IMPACT OF *HELICOBACTER PYLORI* IN PATIENTS WITH CIRRHOSIS

N. TRAD[1,2], *M. GHANEM*[3], *S. BIZID*[2], *B. BEN SLIMEN*[2], *K. BOUGHOULA*[2], *H. BEN ABDALLAH*[2], *R. BOUALI*[2], *M. ABDELLI*[2]
[1]University of medicine of Tunis, Ariana, Tunisia, [2]military hospital of Tunis, Tunis, Tunisia, [3]military hospital of Tunis, Tunis, Tunisia.

Introduction: Cirrhosis is a public health problem all over the world. Recently, some studies have suggested the role of *Helicobacter pylori* (HP) infection in the development of several major complications in patients with cirrhosis.
Aims: Our objective was to determine the prevalence of HP infection and to assess its prognostic impact in patients with cirrhosis.
Methods: This was a retrospective study including all cirrhotic patients followed in our department between January 2010 and December 2020. Demographic, clinical, and paraclinical data were collected.
Results: A total of 224 patients were included. The mean age was 61.02 ±13.2 years and the sex-ratio was 1.6. The main etiology of chronic liver diseases was viral infection C (32.1%) followed by viral infection B (22.8%) and non-alcoholic steatohepatitis (21.4%). Seventy-seven patients with cirrhosis had HP infection (31.7%). HP infection in cirrhotic patients was statistically associated with CHILD score (*p*=0.041), serum albumin (*p*=0.011), total bilirubin (*p*=0.029), CRP (*p*=0.022) and lymphocyte count (*p*=0.047). Upper gastrointestinal bleeding of varicose or ulcer origin was statistically more common in cirrhotic patients with HP infection (*p*=0.021, OR=1.946 [95% IC: 1.101-3.441]). A statistically significant association between HP infection and the occurrence of hepatic encephalopathy in cirrhotic patients has been noted (*p*=0.002, OR= 2.455 [95% IC: 1.376-4.377]).
Conclusion: In our study, the prevalence of HP infection in patients with cirrhosis was 31.7%. These bacteria could promote upper gastrointestinal bleeding and hepatic encephalopathy. Its eradication could improve the prognosis of cirrhotic patients.

N. Trad: None. M. Ghanem: None. S. Bizid: None. B. Ben Slimen: None. K. Boughoula: None. H. Ben Abdallah: None. R. Bouali: None. M. Abdelli: None.

P07.08

THE FREQUENCY OF *HELICOBACTER PYLORI* AND THE STRUCTURE OF THE GASTRIC MUCOSA IN ELDERLY PATIENTS WITH ESOPHAGITIS

V. V. TSUKANOV[1], *E. V. ONUCHINA*[2], *A. V. VASYUTIN*[1], *J. L. TONKIKH*[1]
[1]Federal Research Centre “Krasnoyarsk Science Centre” of the Siberian Branch of Russian Academy of Science, “Scientific Research Institute of medical problems of the North”, Krasnoyarsk, Russian Federation, [2]Irkutsk State Medical Academy of Postgraduate Education – Branch Campus of the FSBEI FPE RMACPE MOH Russia, Irkutsk, Russian Federation.

Aim: To study the frequency of *Helicobacter pylori* and the structure of the gastric mucosa in elderly patients with esophagitis.

Methods: Clinical examination, endoscopy of the upper gastrointestinal tract with biopsy of the gastric mucosa were performed in 129 elderly patients with esophagitis (52 men and 77 women, mean age 69.0 years) and 125 mature patients with esophagitis (52 men and 73 women, mean age 45.6 years). Esophagitis was diagnosed based on Los Angeles classification [Lundell L.R. et al, 1999]. Morphological assessment of the gastric mucosa was performed using the modified Sydney system [Dixon M.F. et al, 1996]. *Helicobacter pylori* was determined by the morphological method in biopsy specimens stained according to Giemsa.
Results: *Helicobacter pylori* was diagnosed in 61.2% of elderly individuals and in 74.4% of mature patients with esophagitis (OR=0.55; CI 0.32-0.93; p=0.03). The frequency of atrophy in the antrum was 79.8% in elderly patients and 8.8% in mature individuals with esophagitis (p<0.001). In the gastric body, these indicators were 27.1% and 0%, respectively (p<0.001). The frequency of intestinal metaplasia in elderly patients with esophagitis was 27.1% in the antrum and 5.4% in the gastric body, in mature patients with esophagitis - 6.4% in the antrum (p<0.001) and 0% in the gastric body (p=0.01).
Conclusion: In elderly patients with esophagitis, in comparison with those of mature age, atrophy and intestinal metaplasia are more often determined and less often *Helicobacter pylori* in the gastric mucosa, which suggests differences in the pathogenetic mechanisms of esophagitis in the studied age groups.

V.V. Tsukanov: None. E.V. Onuchina: None. A.V. Vasyutin: None. J.L. Tonkikh: None.

P07.09

COMORBIDITY PROFILE ACCORDING TO *HELICOBACTER PYLORI* INFECTION STATUS

F. A. D. MORAES[1], G. A. S. SOARES[1], A. F. P. L. RAMOS[1], G. R. DE SOUSA[1], L. G. SILVEIRA[1], A. M. BRITO[2], A. A. FERNANDES[1], G. A. FERNANDES[1], M. P. CURADO[1], ***M. S. BARBOSA***[1]
[1]University Federal of Goiás, Goiânia, Brazil, [2]Goiás Association to Combat Cancer, Goiânia, Brazil.

Helicobacter pylori is a bacterium that infects about 50% of the global population. Infection by the microorganism is associated with the development of gastropathies. However, studies indicate an association with extragastric diseases and some comorbidities. Due to the lack of information on the association of *H. pylori* infection and comorbidities, the present study aimed to verify the presence of comorbidities in dyspeptic patients infected with *H. pylori*. This is a cross-sectional study, carried out from 2019 to 2021, in which 98 questionnaires containing sociodemographic and lifestyle issues of patients undergoing upper digestive endoscopy, followed by biopsy were analyzed. Categorical variables were compared using Pearson's chi-square test, with a significance level of 5%. The prevalence of *H. pylori* infection was 51.02% (50/98). In the positive *H. pylori* group, females were more affected, 60% (30/50), 58% (29/50) were 50 years old or less, 58% (29/50) were married and 72% (36/50) were non-white (black / black, brown, Asian and others). In the negative *H. pylori* group, 60.61% (35/48) were female, 56.25% (27/48) were 50 years old or less, 50% (24/48) were married and 72, 92% (35/48) were non-white. The most common comorbidities in the positive *H. pylori* group were hypertension 38% (19/50), anemia 30% (15/50) and diabetes 12% (6/50). A similar pattern was observed in the negative *H. pylori* group, 29.17% (14/48) of hypertension, 22.92% (11/48) of anemia and 10.42% (5/48) of diabetes. It was not possible to observe an association between *H. pylori* infection and the studied diseases.

M.S. Barbosa: None. F.A.D. Moraes: None. G.A.S. Soares: None. A.F.P.L. Ramos: None. G.R. de Sousa: None. L.G. Silveira: None. A.A. Fernandes: None. G.A. Fernandes: None. M.P. Curado: None. A.M. Brito: None.

ELECTRONIC POSTER ROUND 8

Paediatric conditions

P08.01

FAECAL MICROBIOTA IN INFANTS AND TODDLERS WITH ALLERGY

E. E. I. D. ILVA DAUGULE
University of Latvia, Riga, Latvia.

Objective: Differences of faecal microbiota have been reported in allergic children. To analyse fecal microbiota composition in infants and toddlers with and without allergy.
Methods: Cross-sectional study was performed at primary healthcare centres. The parents filled questionnaire and brought a fecal transfer container. The DNA was extracted and the 16 rRNS gene sequencing was performed to identify the bacterial taxonomic unit up to the species level. The composition (median reads) and diversity (Shannon index) of the faecal microbiota were analyzed in children according to the presence or absence of parent reported allergy. Statistical analysis: descriptive statistics, Mann-Whitney Test, Spearman's rank correlation.
Results: The study included 64 children (47% boys (N=30)) with a median age of 6.00 months (IQR: 4.00-21.25). Children with parent-reported allergy (N=25) compared to children without allergy (N=39) had higher median sequence reads of *Ruminococcus* [913.00 (IQR:0.00-9015.00) *vs.* 0.00(IQR:0.00-213.00); *p*=0.02] and *Blautia* [8560.00 (IQR:2794.50-23054.00) *vs.* 257.00 (IQR:0.00- 10817.00); *p*=0.07] in children with and without allergy, respectively. The median Shannon index in the total sample was 4.11 (IQR:2.48-5.80): 2.71 (IQR:2.31-6.20) in children with allergy *vs.* 4.24 (IQR 2.66-5.56) - in children without allergy.
Conclusion: In our study sample the composition of the feacal microbiota in infants and toddlers with parent-reported allergy showed minor differences compared to microbiota of individuals without allergy with higher predominance of *Ruminococcus* and *Blautia* genus The diversity of the microbiota was only non-significant lower in children with allergy showing the need for prospective analysis of fecal microbiota changes in relation to development of a disease with increasing age.

E.E.I.D. Ilva Daugule: None.

P08.02

CYTOKINE PROFILE IN SCHOOLCHILDREN WITH *HELICOBACTER PYLORI* WITH FAMILIAL BURDEN OF STOMACH CANCER

T. V. POLIVANOVA[1,2], *V. A. VSHIVKOV*[1]
[1]Federal Research Center «Krasnoyarsk Science Center» of the Siberian Branch of the Russian Academy of Sciences – Scientific Research Institute for Medical Problems of the North, Krasnoyarsk, Russian Federation, [2]Professor V.F. Voino-Yasenetsky Krasnoyarsk State Medical University, Krasnoyarsk, Russian Federation.

Cytokines regulate inflammatory processes, including in the gastric mucosa.
Aim: To assess the level of circulating blood cytokines in *Helicobacter pylori*-associated gastritis in schoolchildren with family history of gastric cancer.
Material and methods: A gastroscopy with a biopsy of the gastric mucosa was performed in 179 schoolchildren with gastroenterological complaints. The age of the examined was 7-17 years. Data on the presence of stomach diseases in relatives in the 1st and 2nd generations were obtained. Diagnosis of gastritis was carried out in accordance with the Sydney classification. *H. pylori* was determined after Giemsa staining of biopsy sections. Indicators of cytokines IL-2, IL-4, IL-6, IL-8, IL-10, IL-18, IL-1β, IF-α, TNM-α were determined in blood serum by ELISA. The significance of differences in traits was analyzed using the Mann-Whitney test. The participants had written consent to participate in the study.

Results: In schoolchildren with a family history of gastric cancer with *H. pylori* associated gastritis, no significant differences in the cytokine profile were found. There was a tendency towards a decrease in IL-18 [25.9 (70.0-304.4) and in children without burdening - 82.7 (131.7-214.4); *p*=0.445]. In contrast, among schoolchildren without *H. pylori* with a predisposition to stomach cancer, the level of IL-18 replication in the blood serum was higher [124.3 (176.2-253.7)] than without a familial predisposition (65.6 (131.7-214.4); *p*=0.445).
Conclusion: Considering the key role of interleukin-18 (IL-18) in the activation of cellular immunity in infections, we can talk about its features in schoolchildren with familial burden of stomach cancer.

V.A. Vshivkov: None. T.V. Polivanova: None.

P08.03

CYTOKINE LEVELS IN *HELICOBACTER PYLORI* ASSOCIATED GASTRITIS IN CHILDREN WITH FAMILIAL BURDEN OF PEPTIC ULCER DISEASE

T. V. POLIVANOVA*, V. A. VSHIVKOV*
Federal Research Center «Krasnoyarsk Science Center» of the Siberian Branch of the Russian Academy of Sciences – Scientific Research Institute for Medical Problems of the North, Krasnoyarsk, Russian Federation.

Aim: To assess the levels of cytokines in *Helicobacter pylori*-associated gastritis in children with family history of peptic ulcer disease.
Material and methods: Gastroscopy with biopsy sampling from the gastric mucosa was performed in 179 children with gastroenterological complaints. The age of the examined was 7-17 years. Information was obtained about stomach diseases in relatives in the 1st and 2nd generations. Morphological diagnosis of gastritis was carried out in accordance with the Sydney classification. *H. pylori* was determined by the morphological method. The levels of cytokines IL-2, IL-4, IL-6, IL-8, IL-10, IL-18, IL-1β, IF-α, TNM-α were determined in blood serum by ELISA. The significance of differences in traits was analyzed using the Mann-Whitney test. The participants had written consent to participate in the study.
Results: In gastritis with *H. pylori* in schoolchildren with familial burden of peptic ulcer disease, the features of expression of TNM-α, inducing the inflammatory process (*p*=0.048) and IFN-α (*p*=0.017), were noted. In the absence of peptic ulcer disease in the presence of *H. pylori*, there was an increase in IL-1β (the strongest inhibitor of hydrochloric acid secretion; *p*=0.051). Replication of IFN-α, noted in schoolchildren with a hereditary predisposition, was observed both in the presence of *H. pylori* infection and in its absence (*p*=0.001). This highlights the dominant role of genetic mechanisms in IFN-α replication.
Conclusion: In the presence of *H. pylori*, individuals with a familial predisposition to peptic ulcer disease with gastritis have features of cytokine regulation at the systemic level.

V.A. Vshivkov: None. T.V. Polivanova: None.

P08.04

THE COURSE OF *HELICOBACTER PYLORI* ASSOCIATED GASTRITIS IN SCHOOLCHILDREN OF BURYATIA

T. V. POLIVANOVA[1,2]*, V. A. VSHIVKOV*[1]
[1]Federal Research Center «Krasnoyarsk Science Center» of the Siberian Branch of the Russian Academy of Sciences – Scientific Research Institute for Medical Problems of the North, Krasnoyarsk, Russian Federation,
[2]Professor V.F. Voino-Yasenetsky Krasnoyarsk State Medical University, Krasnoyarsk, Russian Federation.

Buryatia (Asian part of Russia) is an area with a high prevalence of stomach cancer. Given the role of *H. pylori* in the development of the disease, information about the course of infection, including in children, is extremely important.
Aim: To study the course of *H. pylori*-associated gastritis in schoolchildren of Buryatia.

Material and Methods: 68 schoolchildren with gastroenterological complaints at the age of 7-17 years, living in Buryatia, were examined. All underwent gastroscopy. Biopsies were taken from the antrum and corpus of the stomach. The presence of *H. pylori* was assessed after Giemsa staining of biopsy sections. Diagnosis of gastritis was carried out in accordance with the Sydney classification. The analysis of statistical meaning of the differences between qualitative signs was carried out by x2 criterion. To participate in the study, there was a written consent of senior schoolchildren and parents of children under 15 years of age.
Results: The frequency of detection of *H. pylori* among the surveyed schoolchildren was 64.7%. High activity (2-3 degrees) of antral gastritis was determined in the presence of *H. pylori* in 53.2% and in 8.3% in schoolchildren without infection (p=0.0003). In the body of the stomach 2-3, the degree of gastritis activity was established in 27.3% in schoolchildren with gastritis associated with *H. pylori* and in 12.5% without infection (p=0.1603).
Conclusion: In schoolchildren in Buryatia, *H. pylori* has a pronounced effect on increasing the activity of antral gastritis, less in the body of the stomach.

V.A. Vshivkov: None. T.V. Polivanova: None.

P08.05

CK20 IN GASTRIC MUCOSA IN CHILDREN WITH *HELICOBACTER PYLORI*-ASSOCIATED GASTRITIS WITH SUPERIMPOSED GERD

T. V. POLIVANOVA[1,2], *V. A. VSHIVKOV*[1], *O. V. PERETYATKO*[1]
[1]Federal Research Center «Krasnoyarsk Science Center» of the Siberian Branch of the Russian Academy of Sciences – Scientific Research Institute for Medical Problems of the North, Krasnoyarsk, Russian Federation, [2]Professor V.F. Voino-Yasenetsky Krasnoyarsk State Medical University, Krasnoyarsk, Russian Federation.

Aim: To evaluate the expression of cytokeratin CK20 in the gastric mucosa in children with *H. pylori*-associated gastritis, depending on its overlap with GERD.
Material and Methods: The expression of CK20 in the gastric mucosa in *H. pylori*-associated gastritis was assessed in 89 schoolchildren with gastroenterological complaints at the age of 7-17 years. Conducted esophagogastroduodenoscopy with sampling of biopsies of the body and antrum of the stomach. GERD was diagnosed according to the Montreal Consensus. Gastritis was graded according to the Sydney classification. *H. pylori* was determined by the morphological method. The expression of the CK20 protein in the gastric mucosa was assessed by immunohistochemical method. The statistical significance of differences in qualitative characteristics was analyzed using the x2 test.
Results: In schoolchildren with *H. pylori*-associated gastritis with clinical manifestations of GERD, CK20 expression in the antrum was noted in 57.1%, in schoolchildren without GERD in 13.6% (p=0.0071). In gastritis not associated with *H. pylori*, these indicators were 25.0% (p=0.2049) and 0% (p=0.1370), respectively. Expression of CK20 in the mucous membrane of the gastric corpus in gastritis associated with infection was noted in 28.6% in the presence of GERD and in 13.6% (p=0.3128) in the absence of GERD. In gastritis without *H. pylori*, the indicators were 12.5% (p=0.3129) and 0.0% (p=0.0497), respectively.
Conclusion: The expression of CK20 is higher in *H. pylori*-associated gastritis and increases in association with GERD. To a greater extent, the process affects the antrum of the stomach.

T.V. Polivanova: None. V.A. Vshivkov: None. O.V. Peretyatko: None.

P08.06

EXPRESSION OF CK20 IN THE STOMACH IN CHILDREN WITH *HELICOBACTER PYLORI* AND FAMILIAL PREDISPOSITION TO PEPTIC ULCER DISEASE

T. V. POLIVANOVA[1,2], *V. A. VSHIVKOV*[1], *O. V. PERETYATKO*[1]
[1]Federal Research Center «Krasnoyarsk Science Center» of the Siberian Branch of the Russian Academy of Sciences – Scientific Research Institute for Medical Problems of the North, Krasnoyarsk, Russian Federation, [2]Professor V.F. Voino-Yasenetsky Krasnoyarsk State Medical University, Krasnoyarsk, Russian Federation.

Aim: To evaluate the expression of CK20 in the gastric mucosa in *H. pylori*-associated gastritis in children with a familial predisposition to peptic ulcer disease.
Material and Methods: 89 children aged 7-17 years with gastroenterological complaints were examined. Esophagogastroduodenoscopy was performed with biopsies taken from the body and antrum of the stomach. Information was obtained on the presence of peptic ulcer disease in relatives in the 1st and 2nd generations. *H. pylori* was determined after Giemsa staining of biopsy sections. The expression of the CK20 protein in the gastric mucosa was assessed by immunohistochemistry. The statistical significance of differences in qualitative features was analyzed using the x2 criterion.
Results: In schoolchildren with a hereditary predisposition to peptic ulcer disease, CK20 expression was in 22.7% of children and in 11.9% of children without a predisposition (p=0.2139). In schoolchildren with a hereditary predisposition with *H. pylori*-associated gastritis, the expression of CK20 in the antrum of the stomach was determined in 27.3% and in 18.2% without infection (p=0.6109). In children without a predisposition to peptic ulcer disease, respectively, 17.5% and 3.7% (p=0.0876). In the body of the stomach of schoolchildren with a family predisposition, CK20 with *H. pylori*-associated gastritis was determined in 27.3% and in 9.1% without *H. pylori* (p=0.2689). For schoolchildren without a family predisposition, the indicators were 12.5% and 0%, respectively (p=0.0562).
Conclusion: There is a tendency for increased replication of CK20 in gastritis in schoolchildren with a familial predisposition to peptic ulcer disease and its association with *H. pylori*.

T.V. Polivanova: None. V.A. Vshivkov: None. O.V. Peretyatko: None.

P08.07

CK7 IN SCHOOLCHILDREN WITH *HELICOBACTER PYLORI*-ASSOCIATED GASTRITIS

T. V. POLIVANOVA[1,2], *V. A. VSHIVKOV*[1], *O. V. PERETYATKO*[1]
[1]Federal Research Center «Krasnoyarsk Science Center» of the Siberian Branch of the Russian Academy of Sciences – Scientific Research Institute for Medical Problems of the North, Krasnoyarsk, Russian Federation, [2]Professor V.F. Voino-Yasenetsky Krasnoyarsk State Medical University, Krasnoyarsk, Russian Federation.

Aim: To assess the expression of CK7 in the gastric mucosa in *H. pylori*-associated gastritis in schoolchildren in age groups.
Material and methods: The expression of CK7 in the gastric mucosa in *H. pylori*-associated gastritis was assessed in 89 schoolchildren of various ages: 7-11 years old and 12-17 years old. *H. pylori*-associated gastritis was diagnosed by morphological method in accordance with the Sydney classification. The expression of CK7 in the gastric mucosa was assessed by immunohistochemistry. The statistical significance of differences in qualitative characteristics was analyzed using the x2 test.
Results: In 7-11 year old schoolchildren with *H. pylori*-associated gastritis, CK7 expression was observed in the antrum of the stomach in 50.0% and in 18.8% (p=0.0930) in its absence; in the body, the indices of CK7 expression were 70.0% and 12.5%, respectively (p=0.0027). In schoolchildren aged 12-17 years, the expression of CK7 in the antrum was detected in *H. pylori*-associated gastritis in 41.5% and in 45.5% in the absence of infection (p=0.7602). In the body of the stomach in schoolchildren 12-17 years old, the indices of CK7 expression were 29.3% and 22.7%, respectively (p=0.5771). In case of *H. pylori*-associated gastritis in schoolchildren of the younger age group, the indices of CK7 expression were higher than in older schoolchildren (p=0.0169).
Conclusion: Younger schoolchildren have an increase in CK7 replication in *H. pylori*-associated gastritis. The absence of an increase in the expression of CK7 in the stomach in schoolchildren with age indicates the inconsistency of the process.

T.V. Polivanova: None. V.A. Vshivkov: None. O.V. Peretyatko: None.

ELECTRONIC POSTER ROUND 9

Gut microbiota and non-intestinal disease

P09.01

EFFECTS OF INDIGENOUS FECAL BACTERIA CONSORTIUM TREATMENT IN PATIENTS WITH METABOLIC SYNDROME

*E. ERMOLENKO[1,2], A. SUVOROV[1], **K. ERMOLENKO**[3], M. KOTYLEVA[1], N. LAVRENOVA[1], L. VOROPAEVA[1], S. KOTYLEVA[1]*

[1]Federal State Budgetary Scientific Institution «Institute of Experimental Medicine», Saint-Petersburg, Russian Federation, [2]North-Western State medical University named after I.I. Mechnikov, Saint-Petersburg, Russian Federation, [3]Pediatric Research and Clinical Center for Infectious Diseases, Saint-Petersburg, Russian Federation.

Metabolic syndrome (MS) is connected with microbiota distortions. Role of microbiota in this relationship is not fully understood.
Aim: The aim of the study was to investigate the effectiveness of the indigenous consortium of fecal bacteria (IC) in treatment of patients with MS.
Materials and methods: The study was carried out on 38 patients with MS. Patients received basic therapy and functional food with IC prepared by long-term (6 days) anaerobic cultivation (RF RU patent No. 2,734,896 C2). Samples were examined before and after the introduction of the starter culture bacteriologically, by qPCR and metagenomic analysis.
Results: The decrease in phylum Bacteroidetes and Actinobacteria, an increase in the content of atypical *Escherichia coli*, *Prevotella* spp., *Methanosphaera* spp., *Streptococcus* spp., *Blautia* spp., *Acinetobacter* spp., *Enterobacter* spp. in the feces of MS patients was shown. Biological diversity was preserved, but proportion of lactobacilli, bifidobacteria and enterococci significantly increased in IC. The quantity and relative abundance of opportunistic Enterobacter spp., Acinetobacter spp. and atypical *Escherichia coli* decreased. Population of *Bacteroides thetaiotaomicron* increased after IC consumption. A positive clinical effect of autoprobiotics was characterized by the disappearance of dyspeptic symptoms, a tendency to normalize the lipid profile and reduction in the concentration of C-reactive protein.
Conclusion: The decrease in the manifestation of "small inflammation", improved clinical and laboratory parameters, allows us to consider that the IC is a useful component in therapy of MS. The work was supported by the Ministry of Science and Higher Education of the Russian Federation,075-15-2020-902 «Center for personalized Medicine» FSBSI «IEM»

E. Ermolenko: None. K. Ermolenko: None. M. Kotyleva: None. A. Suvorov: None. N. Lavrenova: None. L. Voropaeva: None. S. Kotyleva: None.

ELECTRONIC POSTER ROUND 10

Microbiota and intestinal disease

P10.01

DOUBLE BLIND RCT STUDY ON THE EFFICACY OF *L. REUTERI* 4659 IN REDUCING INFLAMMATORY MARKERS IN PATIENTS AFFECTED BY ACUTE UNCOMPLICATED DIVERTICULITIS

V. OJETTI[1], *A. SAVIANO[1], M. BRIGIDA[2], C. PETRUZZIELLO[3], M. CARONNA[1], M. CANDELLI[1], M. COVINO[1], F. FRANCESCHI[1]*

[1]Fondazione Policlinico Universitario A. Gemelli, IRCCS, Rome, Italy, [2]Policlinico Tor Vergata, Rome, Italy, [3]Ospedale Cristo Re, Rome, Italy.

Introduction: Recent guidelines suggest treating acute uncomplicated diverticulitis (AUD) without antibiotics. We tested the efficacy of *Lactobacillus reuteri* 4659 (*L. reuteri*) in treating AUD. Primary outcome was reduced abdominal pain and inflammatory markers (C-RP and calprotectin). Secondary outcome was reduced hours of hospitalization.
Patients and methods: A double-blind, RCT was conducted in 119 (49M/70F mean age 65.1± 20.0) patients with a diagnosis of AUD. Group A (61 patients, 36F) were treated with fluids, bowel rest, plus *L. reuteri*/bid for 10 days. Group B (58 patients, 34F) with the same therapy plus placebo/bid for 10 days. All patients completed a daily visual analogue scale (VAS) for abdominal pain.
Results: Both groups showed a mean VAS score of 7 at enrollment and a reduction of 4 points after 3 days. As regards C-RP value, the decrease after 72 h was of 58.8% in the probiotic group and of only 40% in the control group ($p < 0.05$). Probiotic group decreased in calprotectin levels of 17.2% after 72 h, meanwhile the control group decreased only of 10.6% ($p < 0.05$). In *L. reuteri* group the hospitalization was 75.5 hours compared to 83.5 in the placebo group.
Conclusions: Our RCT showed that the supplementation with *L. reuteri* strain 4659 together with bowel rest and fluids significantly reduced both blood and faecal inflammatory markers compared with the placebo group.

V. Ojetti: None. A. Saviano: None. M. Brigida: None. C. Petruzziello: None. M. Caronna: None. M. Candelli: None. M. Covino: None. F. Franceschi: None.

P10.02

EFFECTS OF CYTOKINES IN CHRONIC GASTRODUODENITIS ASSOCIATED WITH *HELICOBACTER PYLORI*, FUNGI AND PROTOZOA INVASION

E. V. AGAFONOVA[1], *G. S. ISAEVA*[1], *R. A. ISAEVA*[2], *N. G. EFIMOVA*[3], *R. R. BURKHANOV*[4]
[1]Kazan State Medical University, Kazan Research Institute of Epidemiology and Microbiology, Kazan, Russian Federation, [2]Sechenov First Moscow State Medical University, Moscow, Russian Federation, [3]Republican Clinical Oncological Dispensary Republic of Tatarstan, Kazan, Russian Federation, [4]Polyclinic of Medical and Sanitary unit of the Ministry of Internal Affairs of the Russian Federation in the Republic of Tatarstan, Kazan, Russian Federation.

In chronic pathology of the gastrointestinal tract, inflammatory process associated with *Helicobacter pylori* (HP) disrupts immunocytokine regulation and tissue trophism, which contributes to the persistence other pathogens. Target. Study of the cytokine profile (CP) in chronic gastroduodenitis (CGD) associated with infection HP and other pathogens. Methods. Patients with CGD associated HP (HP+; N= 84), long-term course and resistance to conventional therapy were examined. The identification of infection included a comprehensive study of biopsy. Cytokines was determined: TNF-α, IL-1β, IFN-γ and apoptosis marker - sCD95 (sAPO-1/FAS) by ELISA. Results.
In patients with CGD, associations of pathogens: HP+ fungi Candida (C) recorded in 40.5%; HP + C + protozoa (Lamblia intestinalis, L) + 10.7%. CP study in groups HP- (control, N = 12); HP + (monoinvasion, N = 38); HP + C + (N = 34); H + C + L+ (N = 9). In the HP + group, increase the levels of proinflammatory cytokines TNF-α, IL-1β b (13.4; 32.4 pg/ml), sCD95 (6.8 pg/ml) and a decrease the level of IFN-γ (2.3 pg/ml). An increase proinflammatory cytokines was noted in the HP + C + groups; HP+C+L-IL 1 (40.9; 30.1 pg/ml), TNF-a (30.1;42.1 pg/ml), which correlated increased TNF-dependent apoptosis. With mixed infection, increase imbalance of IL 10/ IFN γ was towards an increase IL 10 and decrease IFN γ (44.8/1.0; 45.8/0.3) Conclusions. The effects of cytokines determine increased levels local inflammation, TNF-dependent apoptosis, and pathogen-induced immunosuppression.

E.V. Agafonova: None. G.S. Isaeva: None. R.A. Isaeva: None. N.G. Efimova: None. R.R. Burkhanov: None.

P10.03

RIFAXIMIN FOR SMALL INTESTINAL BACTERIAL OVERGROWTH: A RETROSPECTIVE STUDY

C. MOSONI[1], *G. GASBARRINI*[2], *T. DIONISI*[1], *A. GASBARRINI*[1], *L. LOPETUSO*[3,4,5]
[1]Istituto di Medicina Interna, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario A. Gemelli, Rome, Italy, [2]Professore Emerito di Medicina Interna, Università Cattolica del Sacro Cuore, Rome, Italy, [3]CEMAD Digestive Disease Center, Dipartimento di Scienze Mediche e Chirurgiche, Fondazione Policlinico Universitario "A. Gemelli" IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy, [4]Department of Medicine and Ageing Sciences, "G. d'Annunzio" University of Chieti-Pescara, Chieti, Italy, [5]Center for Advanced Studies and Technology (CAST), "G. d'Annunzio" University of Chieti-Pescara, Chieti, Italy.

Rifaximin seems to be effective and safe in treating gastrointestinal aspecific symptoms associated with small intestinal bacterial overgrowth (SIBO), however, to date there is no consensus regarding the proper timing of therapy. The present study, an extension of a study already presented at the EHMSG 2019 Congress, aims to provide preliminary data regarding the effects of rifaximin administered at the dosage of 600 mg/day for five days in patients with an established diagnosis of SIBO. We retrospectively analysed clinical records and lactulose breath tests of 15 otherwise healthy patients (8 males and 7 females) aged between 30 and 60 years old, complaining of gastrointestinal symptoms consistent with SIBO.
The patients had baseline lactulose breaths test suggestive of SIBO. 7 subjects were treated with rifaximin at the daily dose of 600 mg (200 mg after each of the 3 meals), for 5 days per month. The other 8 subjects were treated with the same daily dose of Rifaximin, but for two monthly cycles of 5 days each. All the patients repeated the breath test after one month. The results of the breath tests performed at the baseline and after a month were compared to determine whether the different dosage of the therapy had had different effects. When comparing breath test results between the two groups, we observed that Rifaximin may be able to improve intestinal dysbiosis and gastrointestinal symptoms due to SIBO, with results that seem to be more evident when rifaximin is administered in two monthly cycles rather than one.

C. Mosoni: None. G. Gasbarrini: None. T. Dionisi: None. A. Gasbarrini: None. L. Lopetuso: None.

P10.04

GUT MICROBIOTA MODIFICATION IN PATIENTS WITH INFLAMMATORY BOWEL DISEASES WHO DO NOT RECEIVED AND RECEIVED BIOLOGICAL THERAPY

N. V. BARYSHNIKOVA[1,2], *Y. P. USPENSKIY*[1,3], *A. N. SUVOROV*[2], *M. A. SUVOROVA*[2], *V. I. LYUDYNO*[2], *E. I. ERMOLENKO*[2]
[1]Pavlov First St-Petersburg State Medical University, St-Petersburg, Russian Federation, [2]Institution of experimental medicine, St-Petersburg, Russian Federation, [3]St-Petersburg State Pediatric Medical University, St-Petersburg, Russian Federation.

Background: Gut microbiota disorders is an important factor in the pathogenesis of inflammatory bowel diseases (IBD). Biological therapy can be an additional factor to stimulate microbiota modification. The aim: to estimate the gut microbiota disorders in patients with IBD.
Materials and methods: We investigated fecal samples to determine features of gut microbiota of 22 patients with IBD (12 patients not received biological therapy and 10 patients received biological therapy (BT)). We used real-time polymerase chain reaction with fluorescent detection for fecal examination. Statistical processing was performed using the SPSS8.0 software package. Results: 100% of patients showed negative changes in gut microbiota. Patients who received BT have microbiota disorders worse than in patients who not received BT (table).

Conclusion: Patients with IBD who undergo BT treatment and who do not received BT both exhibit significant microbiota negative modification. That's why probiotic treatment of fecal microbiota transplantation is necessary to use in complex treatment of IBD.

N.V. Baryshnikova: None. Y.P. Uspenskiy: None. A.N. Suvorov: None. M.A. Suvorova: None. V.I. Lyudyno: None. E.I. Ermolenko: None.

TABLE 1. GUT MICROBIOTA MODIFICATION IN PATIENTS WITH IBD WITH OR WITHOUT BT.

Microorganism/%	Without BT	With BT
Bacterial mass increase	17	10
Lactobacillus spp. decrease	50	90
Bifidobacterium spp. increase	25	80
Candida spp.	42	0
Clostridium difficile	25	10
Clostridium perfringens	17	20
Klebsiella pneumonia	33	60
Proteus vulgaris/mirabilis	17	40
Citrobacter spp.	25	20
Enterobacter spp.	25	30
Fusobacterium nucleatum	17	10
Parvimonas micra	17	40
Bacteroides fragilis group/Faecalibacterium prausnitzii	33	30

mITT: modified intention-to-treat; PP: per-protocol, N: total number of patients analysed.

ELECTRONIC POSTER ROUND 11

Microbiota and cancer

P11.01

PRESENCE OF COLIBACTIN-PRODUCING *E.COLI* IN BILIARY JUICE AND DEVELOPMENT OF CHOLANGIOCARCINOMA

M. SOHRABI[1], *F. ALIDAEE*[2], *M. RAOOFIMANESH*[2], ***P. SANIEE***[2]
[1]Gastrointestinal and Liver Diseases Research Center, Iran University of Medical Sciences and Firouzgar hospital, Tehran, Iran, Islamic Republic of, [2]Shahid Beheshti University, Tehran, Iran, Islamic Republic of.

Introduction: Cholangiocarcinoma is the most common malignancy of the bile ducts with high mortality rate. Recent studies have focused on biliary microbiota as an environment-related factor of cholangiocarcinoma. In this study, presence of colibactin - producing *E. coli* which is involved in the etiology of colorectal tumorigenesis was assessed in biliary juice obtained from 20 patients and 20 controls.
Methods: Biliary fluids was collected during endoscopic retrograde cholangiopancreatography (ERCP) from 20 patients with cholangiocarcinoma and 20 controls and subjected to DNA extraction. Amplification of *E. coli*-specific *16S rRNA* gene as well as colibactin gene cluster were performed using appropriate primers. PCR product were sequenced in both forward and reverse directions.
Results: Biliary juice of 12/20 cholangiocarcinoma patients and 16/20 controls were *E. coli* positive. Totally 6 patients (2 patients with cholangiocarcinoma and 4 controls) had colibactin - producing *E. coli* in their biliary juice. No association was found between the presence of colibactin-producing *E. coli* and cholangiocarcinoma.
Discussion: Result of this study demonstrated that although colibactin-positive *E. coli* has carcinogenic potential, these bacteria are not related to cholangiocarcinoma. Nevertheless, further studies on their interaction with other biliary microbiota and host factors could elucidate their possible role in biliary malignancies.

P. Saniee: None. M. Sohrabi: None. F. Alidaee: None. M. Raoofimanesh: None.

P11.02

BACTERIA-DERIVED EXTRACELLULAR VESICLES IN URINE AS A NOVEL BIOMARKER FOR GASTRIC CANCER: INTEGRATION OF LIQUID BIOPSY AND METAGENOME ANALYSIS

J. PARK[1], T. SHIN[2], ***J. KIM[1]****, Y. KIM[2]*
[1]Chung-Ang University College of Medicine, Seoul, Korea, Republic of, [2]Institute of MD Healthcare Inc., Seoul, Korea, Republic of.

Early detection is crucial for improving the prognosis of gastric cancer, but there are no non-invasive markers for early diagnosis of gastric cancer with high accuracy in real clinical settings. Recently, extracellular vesicles (EVs) secreted from bacteria has emerged as new biomarker resources. We aimed to evaluate the microbial composition in gastric cancer using microbiome-derived EVs, and to build a diagnostic prediction model for gastric cancer with the collected metagenome data.
Stool, urine, and serum samples were prospectively collected from 475 subjects (gastric cancer patients, 163; healthy controls, 312). The bacterial and EV portions of stool samples were divided and analyzed respectively, while sterile urine and serum were analyzed only for EV portions. Differences in microbial diversity and composition were analyzed with 16S rRNA gene profiling, using next-generation sequencing method. The selection of biomarkers using logistic regression models was based on relative abundances at genus level.As a result, the microbial composition of healthy groups and gastric cancer patient groups was significantly different in all sample types. The compositional differences of various bacteria, based on relative abundances, were identified at the genus level. Among the diagnostic prediction models for gastric cancer, urine-based model showed the highest performance when compared to that of stool or serum. We suggest that bacterial-derived EVs in urine can be used as novel metagenomic markers for non-invasive diagnosis of gastric cancer, by integrating the liquid biopsy method and metagenome analysis.

J. Kim: None. J. Park: None. T. Shin: None. Y. Kim: None.

ELECTRONIC POSTER ROUND 12

Gut microbiota manipulation

P12.01

SACCHAROMYCES BOULARDII CNCM I-745 SUPPLEMENTATION MODIFIES THE FECAL RESISTOME DURING THE *HELICOBACTER PYLORI* ERADICATION THERAPY

S. G. CIFUENTES[1]*, M. FORNASINI[2], H. COHEN[3], M. E. BALDEÓN[2], P. CÁRDENAS[1]*
[1]Instituto de Microbiología, Universidad San Francisco de Quito, Quito, Ecuador, [2]Facultad de Ciencias Médicas, de la Salud y la Vida, Universidad Internacional del Ecuador, Quito, Ecuador, [3]Clínica de Gastroenterología Prof. Dra. Carolina Olano, Facultad de Medicina, Montevideo, Uruguay.

The gut microbiota is a significant reservoir of antimicrobial resistance genes (ARGs). The use and misuse of antimicrobials can select multi-resistant bacteria and modify the repertoire of ARGs in the gut. Developing effective strategies to manipulate the intestinal resistome would allow us to fight against the antimicrobial resistance threat. Previously, diet and functional foods have been used to manage gut resistome with promising results. Applying shotgun metagenomics, we compared the composition of fecal resistome from individuals treated with triple therapy for *Helicobacter pylori* plus *Saccharomyces boulardii* CNCM I-745 (G1) (n=37) versus triple therapy without *S. boulardii* CNCM I-745 (G2) (n=34) before treatments (M1), immediately after treatments (M2), and one month after treatments (M3).
Using the Resfinder database, we identified 645 unique ARGs in all fecal samples, conferring resistance to 18 classes of antibiotics. The ARGs most frequently identified were against beta-lactams (53.5%), fo-

late pathway antagonists (13.0%), tetracyclines (9.9%), and aminoglycosides (9.7%). The most abundant ARGs in both treatment groups were against tetracyclines, beta-lactams, fluoroquinolones, and aminoglycosides. We observed a significantly lower abundance of ARGs in G1 than in G2 immediately after treatments (M2) (Wilcoxon rank-sum test; P = 0.026). At the same time point M2, we also observed less richness in group G1 than G2, but this difference was not significant. Our study demonstrated that the abundance of ARGs was significantly reduced when antibiotic eradication therapy was supplemented with *S. boulardii* CNCM I-745 in subjects infected with *H. pylori*.

S.G. Cifuentes: None. M. Fornasini: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Significant; Biocodex. H. Cohen: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Significant; Biocodex. F. Consultant/Advisory Board; Modest; Biocodex. M.E. Baldeón: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Significant; Biocodex. P. Cárdenas: B. Research Grant (principal investigator, collaborator or consultant and pending grants as well as grants already received); Significant; Biocodex.

P12.02

ORIGINAL ARTICLE. FECAL MICROBIOME TRANSPLANTATION FOR RECURRENT CDI TREATMENT: EFFICACY, SHORT AND LONG-TERM FOLLOW-UP RESULTS FROM CONSECUTIVE CASE SERIES.

T. URBONAS[1,2], *G. IANIRO*[3], *R. GEDGAUDAS*[1,2], *M. URBA*[1,2], *V. KIUDELIS*[1,2], *G. KIUDELIS*[1,2], *V. PETKEVICIUS*[1,2], *A. VITKAUSKIENE*[4], *G. CAMMAROTA*[3], *A. GASBARRINI*[3], *J. KUPCINSKAS*[1,2]
[1]Department of Gastroenterology, Lithuanian University of Health Sciences, Kaunas, Lithuania, [2]Institute of Digestive Research, Lithuanian University of Health Sciences, Kaunas, Lithuania, [3]Department of Gastroenterology, Gemeli Hospital, Rome, Italy, [4]Department of Clinical Microbiology and Infectious Diseases, Lithuanian University of Health Sciences, Kaunas, Lithuania.

Background: Many studies have shown high effectiveness of fecal microbiota transplantation (FMT) in treatment of recurrent or refractory Clostridium difficile infection (CDI). Nevertheless, data on long term outcomes and complications after FMT are still lacking.
Materials and methods: Our study included 60 consecutive patients that were treated for recurrent CDI infection. In all patients FMT was performed through nasoenteric tube. Fresh donor feces were used for FMT from unrelated donors. Follow up data included information about recurrent CDI episodes, early and late complications, health status at 3, 12 and 24 months after FMT.
Results: FMT was performed for 60 patients with recurrent CDI. Clinical improvement after the first FMT procedure was observed in 48 patients (80%). 10 of 12 initially non-responding patients had clinical resolution after a second FMT leading to an increased overall cure rate of 96.7%. The remaining two patients needed a third FMT with a final overall cure rate of 100%. Nine of 60 patients were under immunosuppressive therapy. Patients were followed up for a median of 20 months. During the follow-up period no long-term serious adverse events (SAE) were documented.
Conclusions: Our study confirms excellent efficacy rates of FMT in the treatment of recurrent CDI. In addition, this study shows that it is possible to avoid short term SAE when FMT is administered *via* nasoenteric tube by following very stringent peri-procedural patient follow-up protocol. Our study also demonstrates good safety with low rate of long-term adverse events after FMT.

T. Urbonas: None. G. Ianiro: None. R. Gedgaudas: None. M. Urba: None. V. Kiudelis: None. G. Kiudelis: None. V. Petkevicius: None. A. Vitkauskiene: None. G. Cammarota: None. A. Gasbarrini: None. J. Kupcinskas: None.

ELECTRONIC POSTER ROUND 13

Microbiota detection and analysesn

P13.01

GUT MICROBIOTA COMPOSITIONAL AND FUNCTIONAL FINGERPRINT IN PATIENTS WITH ALCOHOL USE DISORDER AND ALCOHOL ASSOCIATED LIVER DISEASE

***D. TOMMASO**, G. ADDOLORATO, F. R. PONZIANI, A. GASBARRINI, G. B. GASBARRINI*
Fondazione Policlinico Gemelli IRCCS, Rome, Italy.

Alcohol use disorder (AUD) represents the most common cause of liver disease. The gut microbiota plays a critical role in the progression of alcohol-related liver damage. Aim of this study was to characterize the gut microbial composition and function in AUD patients with alcohol-associated liver disease (AALD). This study included 36 AUD patients (14 with cirrhosis) who were active drinkers and an equal number of matched controls. Stool microbial composition, serum levels of lipopolysaccharide, cytokines/chemokines and gut microbiota functional profile were assessed. AUD patients had a decreased microbial alpha diversity as compared to controls (0.092 *vs.* 0.130, p=.047) and a specific gut microbial signature.
The reduction of Akkermansia and the increase in Bacteroides were able to identify AUD patients with an accuracy of 93.4%. Serum levels of lipopolysaccharide (4.91 *vs.* 2.43, p=.009) and pro-inflammatory mediators (tumour necrosis factor alpha 60.85 *vs.* 15.08, p=.001; interleukin [IL] 1beta 4.43 *vs.* 1.72, p=.0001; monocyte chemoattractant protein 1 225.22 *vs.* 16.43, p=.006; IL6 1.87 *vs.* 1.23, p=.008) were significantly increased in AUD patients compared to controls and in cirrhotic patients compared to non-cirrhotic ones (IL6 3.74 *vs.* 1.39, p=.019; IL8 57.60 *vs.* 6.53, p=.004). The AUD-associated gut microbiota showed an increased expression of gamma-aminobutyric acid (GABA) metabolic pathways and energy metabolism.AUD patients present a specific gut microbial fingerprint, associated with increased endotoxaemia, systemic inflammatory status and functional alterations that may be involved in the progression of the AALD and in the pathogenesis of AUD.

D. Tommaso: None. G. Addolorato: None. F.R. Ponziani: None. A. Gasbarrini: None. G.B. Gasbarrini: None.

P13.02

GUT BACTERIA FUNCTIONALITY PROFILES AND DIVERSITY INDEX DETECTED BY THE GA-MAP® DYSBIOSIS TEST LX

***K. GRAVDAL**, G. KIRUBAKARAN, A. BRÅTHEN KRISTOFFERSEN, C. CASÉN*
Genetic Analysis AS, Oslo, Norway.

The GA-map® Dysbiosis Test Lx results provide a comprehensive list of increase or deficiency of several bacteria in the human gut based on detection of 48 bacteria markers. To enhance the clinical reasoning and interpretation of the microbiota results, GA has additionally developed the GA-map® diversity index and functional bacteria profiles.
GA-map® diversity index quantitatively estimate the bacteria diversity of a sample using signal strength data from 28 non-correlated bacteria markers. Each sample is assigned a diversity index value ranging from 0 to 5 where the higher the value, the greater diversity. Functional bacteria profiles enable easy recognition of the presence or deficiency of bacteria maintaining important gut functions. Based on literature search and our own findings, selected bacteria markers were consolidated into five profiles representing different functions (Table 1). Utilizing the bacteria abundances from the GA-map® Dysbiosis Test Lx, criteria were set for each profile.
With the additional new tools – GA-map® diversity index and functional bacteria profiles – clinicians can gain perspective of the magnitude of the gut bacteria imbalance and its potential effects on gut functions. In line with the increasing knowledge about gut bacteria functionality, we will see more functional profiles established in the future.

K. Gravdal: A. Employment (full or part-time); Significant; Genetic Analysis AS. G. Kirubakaran: A. Employment (full or part-time); Significant; Genetic Analysis AS. A. Bråthen Kristoffersen: A. Employment (full or part-time); Significant; Genetic Analysis AS. C. Casén: A. Employment (full or part-time); Significant; Genetic Analysis AS. E. Ownership Interest (stock, stock options, patent or other intellectual property); Significant; Genetic Analysis AS.

TABLE 1. GUT BACTERIA FUNCTIONALITY PROFILES AND SET PROFILE CRITERIA.

Functional bacteria profiles	Bacteria marker	Criteria (abundance of one/several bacteria markers)
Butyrate producing bacteria	*Anaerobutyricum hallii* *[Eubacterium] rectale* *Faecalibacterium prausnitzii*	Reduced abundance in at least two markers
Gut mucosa protective bacteria	*Faecalibacterium prausnitzii* *Akkermansia muciniphila*	Reduced abundance in both markers
Gut intestinal health marker	*Faecalibacterium prausnitzii*	Reduced abundance, at least below -1
Gut barrier protective and potentially harmful bacteria	*Faecalibacterium prausnitzii* *Ruminococcus gnavus* *Proteobacteria* *Shigella spp./Escherichia spp.*	Reduced abundance in protective marker (F. prausnitzii) and increased abundance in at least one potentially harmful bacteria marker
Pro-inflammatory bacteria	*Proteobacteria* *Shigella spp./* *Escherichia spp.*	Increased abundance in both markers, and at least one above +1

P13.03

EFFECTS OF GREEN TEA AND POST-FERMENTED GREEN TEA EXTRACT ON OBESE ADULTS: A RANDOMIZED DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL FOCUSED ON CHANGE OF GUT MICROBIOTA

M. JU[1]*, N. KIM*[2]*, C. SHIN*[1]*, D. LEE*[1]*, N. KIM*[1]*, H. YOON*[1]*, T. OH*[1]*, Y. PARK*[1]
[1]Seoul National University Bundang Hospital, Seongnam, Gyeonggi, Korea, Republic of, [2]Seoul National University, Seoul, South Korea, Korea, Republic of.

Aims: The aim of this study was to evaluate the effects of green tea extract (GTE) and post-fermented green tea extract (FTE), on obese individuals in terms of changes in body weight, visceral fat, and laboratory profiles, and to find out the relevance through the changes in gut microbiota.
Methods: A total of 120 obese adults were enrolled to the study. They were randomly assigned to the GTE, FTE, and placebo groups. Laboratory data, abdominal CT, dual-energy X-ray absorptiometry, fecal and urine samples were collected.
Results: At week 12, there were no differences in body weight and BMI in the groups ($p > 0.05$ by ANOVA). Changes of visceral fat area and fat percent were not different in the groups ($p > 0.05$ by ANCOVA test). However, fat percent was decreased (from 40.3% to 39.8%), and fat free mass was increased (from 40.7 to 40.9) in FTE group only (paired t-test $p = 0.007$ and 0.006). The fecal microbiome profiles of each group did not differ between baseline and week 6 and 12. Although composition of bacteria-derived extracellular vesicles in urine was different between placebo and GTE/FTE groups, there was no significantly different taxon in the groups.
Conclusion: The administration of GTE or FTE for 12 weeks does not have a significant effect on body weight and BMI in the obese. However, FTE may have a beneficial effect on body fat mass in these population. GTE or FTE supplementation may not change the composition of fecal or urine microbiota substantially.

M. Ju: None. N. Kim: None. C. Shin: None. D. Lee: None. N. Kim: None. H. Yoon: None. T. Oh: None. Y. Park: None.

P13.04

A PORTABLE H2-BREATH TRACKER: LABORATORY ASSESSMENT

E. KOLOMINA[1], *M. DMITRIENKO*[2], *V. KILIMNIK*[2], *A. CHEKMENEVA*[2]
[1]St. Petersburg State University, St. Petersburg, Russian Federation, [2]AMA Co Ltd, St. Petersburg, Russian Federation.

Introduction: The recent COVID-19 outbreak reaffirmed the importance of the gut microbiome for the overall health of the host: the severity of the infection was higher in individuals with altered gut microbiota. Also, the importance of in-home testing became clear when non-essential health services were paused during another spike of infection. With this in mind, we decided to design a simple breath tracker for in-home hydrogen breath testing to monitor the health of the gut.
Materials and methods: A prototype of a portable H2-breath tracker was constructed using a commercially available hydrogen-sensitive MEMS sensor. The prototype was tested in a laboratory environment at a range of hydrogen concentrations appropriate for levels in exhaled air: from 1 ppm to 10 ppm with a step of 1 ppm. A calibration gas mixture with a concentration of 100 ppm was diluted with pure air to obtain desired concentrations. All measurements were compared to an H2-breath analyzer intended for clinical use. The corresponding reaction to possible interfering gases was tested using CH4 and acetone.
Results: The obtained data was mathematically analyzed, conversion equations of the output signal to H2 concentrations were obtained. The prototype was sensitive to all concentrations used in the experiment. A strong correlation between results measured with the prototype and H2-analyzer was observed. CH4 and acetone do not interfere with the signal.
Conclusions: The constructed portable H2-breath tracker showed promising results. We hope to test it with human exhaled air soon.

E. Kolomina: None. M. Dmitrienko: None. V. Kilimnik: None. A. Chekmeneva: None.

sercon

Sercon ABCA Breath Test Instruments

Many Requirements One solution

- The accepted gold standard for breath testing since 1996. High automated throughput of 240 samples, with reloading for up to 336 samplesIntuitive software and reporting.
- The only dedicated H Pylori IRMS instrument to be FDA approved.
- Multiple breath applications available (liver function, bacteria overgrowth, pancreatic function, lactose intolerance, gastric emptying, fat malabsorption and lipid metabolism).

- Compact design ideal for point of care.
- High efficiency - Fast operation, 2 - 3 minutes for one set samples automatic batch testing.
- Simple - One-touch operation, automatic control systems.
- Analytical results generated within 3 minutes.

- Approved by the European commission in 1997
- Complete solution for breath testing

ISO 9001:2015 Certified
ISO 13485:2016 Certified

Sercon Limited, Unit 3B, Crewe Trade Park,
Gateway, Crewe, Cheshire CW1 6JT UK
Tel: +44 (0)1270 580008 Email: sales@sercongroup.com

www.sercongroup.com

SerconLimited @SerconLimited

AUTHOR INDEX

Detect and **confirm** eradication of an **active** *H. pylori* infection in just minutes

Compact, sample-to-result GI assay platform

- **Simple** sample prep
- **Easy**, standardized workflow - less than 1 minute hands-on time
- **Flexible** testing options - batch or load-and-go option
- Fluorescent technology **improves performance, removes subjectivity**

Visit Curian® HpSA® virtually
www.meridianbioscience.com/meetcurian

Let's get social!

meridian BIOSCIENCE®
LIFE DISCOVERED. LIFE DIAGNOSED.

3471 River Hills Drive, Cincinnati, Ohio | Tel: 888-763-6769 | sales@meridianbioscience.com

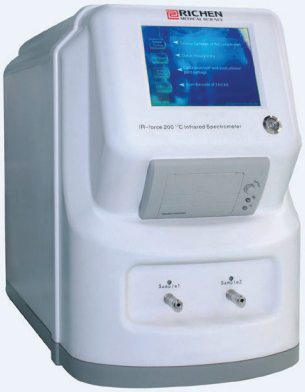
KEYWORD INDEX

RICHEN MEDICAL SCIENCE

European Helicobacter & Microbiota Study Group

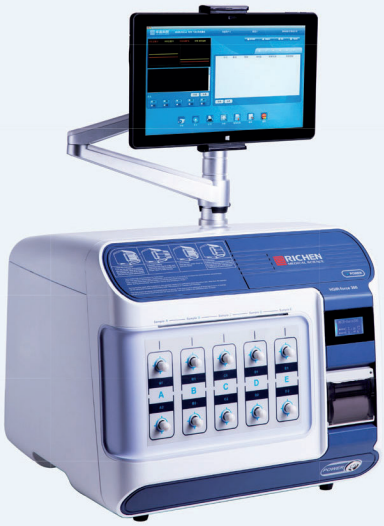
New Instruments Generations in Breath Test Analysis

TIME FOR CHANGE



IR-FORCE 200 Android

IR-FORCE 200 Fancy



IR-FORCE 300 Plus

RICHEN MEDICAL SCIENCE

Beijing Richen - force Science & Technology Co., Ltd
4/A, Dian Tong Creative Square,
No.7 Jiuxianqiao North Street Chaoyang District, Beijing, China

RICHEN EUROPE S.R.L. COMPANY OF RICHEN GROUP

European Subsidiary: Richen Europe S.r.l.,
Via San Cristoforo, 78 - 20090 Trezzano Sul Naviglio, Milano, Italy

Helicobacter Test INFAI®

One of the most used ^{13}C-urea breath tests for the diagnosis of Hp-infections worldwide

- New line of INFAI packaging and serialization according the EU's Falsified Medicines Directive
- More than 7.0 million Helicobacter Test INFAI performed worldwide
- Registered in more than 40 countries worldwide
- First approved Hp test for children from the ages of 3 to 11
- Modified Hp test for patients taking PPIs (REFEX)
- Modified Hp test for patients with atrophic gastritis
- Cost-effective CliniPac Basic for hospital and GPs use

INFAI GmbH
Riehler Str. 36
50668 Cologne
Germany

Phone: +49 221 880 44-3
Fax: +49 221 880 44-55
Email: mail@infai.de, info@infai.co.uk
Web: www.infai.de, www.infai.co.uk