

Incidence, clinical phenotype and treatment of inflammatory bowel diseases in Eastern and Western European centers and the prevalence of smoking and extraintestinal manifestations in the population-based database from Veszprém county

PhD thesis

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Introduction

Inflammatory bowel diseases (IBD) are chronic gastrointestinal diseases of unknown etiology. The interaction of environmental, genetical and immunological might play a central role in its pathogenesis. Recently, the **epidemiology** of IBD has changed significantly. According to the tendencies of the last decades, the incidence of IBD is still high in Western Europe and North America, while increasing incidence rates were reported from Eastern Europe, Asia, Africa and South America.

To compare the incidence rates of different regions, prospective, multicenter studies were initiated. In the **EC-IBD study** from the 1990s, no difference was found in the incidence rates of IBD between Northern and Southern Europe. In the **ECCO-EpiCom study** from 2010, the incidence of IBD was twice as high in the Western European countries compared to the Eastern European countries. In some Eastern European centers, the incidence of IBD was similar to that in the Western European centers.

Smoking is one of the most important environmental factors in the pathogenesis of IBD, but it has a dichotomous effect in CD and UC. According to previous studies, smoking increased the risk for developing CD, and it also had a harmful effect on the course of the disease with higher need for steroids and immunosuppressives and with higher surgery rates. In contrast, smoking decreased the risk for developing UC and favourable disease course was reported in smokers. So far, limited data are available on the age- and gender-specific effects of smoking in IBD patients.

Extraintestinal manifestations (EIMs) may develop in almost half of the IBD patients during their disease course. Only few population-based studies are available on the association of EIM and medical therapy and disease course of IBD.

IBD patients are at higher risk for developing **venous thromboembolic events (VTE)**, mainly in active disease. So far, few population-based studies were conducted on the incidence of VTE and their relationship with disease phenotype and disease outcomes.

Aim

The aims of the PhD thesis are the following:

- 1-2. In the multicenter, population-based ECCO-EpiCom study from 2011, our aim was to investigate the incidence of IBD, the disease phenotype, the medical therapy and the surgery and hospitalization rates in the participating Eastern and Western European and Australian centers during the first three months and during the first year after diagnosis.
3. In the population-based study from the IBD database from Veszprém county, our aim was to investigate the association of smoking with disease phenotype, gender and age of IBD patients, medical therapy and the risk of surgery.
4. In the population-based study from the IBD database from Veszprém county, our aim was to investigate the prevalence of EIM and anaemia and their association with disease phenotype, medical therapy and the risk of hospitalization and surgery.
5. In the population-based study from the IBD database from Veszprém county, our aim was to investigate the incidence of VTE and their relationship with disease phenotype, medical therapy and the risk of hospitalization and surgery.

Methods

1-2. The incidence of IBD, disease phenotype, medical therapy and disease outcomes in the multicenter, population-based ECCO-EpiCom study from 2011

In this study, five centers from Eastern Europe, nine centers from Western Europe and one center from Australia participated (Eastern European centers: Prague – Czech Republic, Veszprém county - Hungary, Kaunas city and district - Lithuania, Chisinau - Moldova, Timis - Romania; Western European centers: Nicosia - Cyprus, Amager - Denmark, Herlev - Denmark, Faroe Islands, Ioannina - Greece, Beer Sheva and Northern Negev - Israel, Northern Italy, Vale de Sousa - Portugal, Vigo - Spain; Australian center: Melbourne). IBD patients diagnosed between 01.01.2011 and 31.12.2011 were included. All participating centers used the Copenhagen Diagnostic Criteria for identifying CD, UC and IBD-unclassified (IBDU). The disease phenotype was defined according to the Montreal Classification. Treatment was grouped into five levels of ascending therapeutic potency: 1. 5-aminosalicylate (5-ASA) therapy (oral and/or topical 5-ASA treatment ± topical steroids), 2. Glucocorticosteroids (oral steroids ± 5-ASA or local steroids), 3. Immunomodulators (azathioprine, 6-mercaptopurine, cyclosporine or methotrexate treatment ± steroids), 4. Biological therapy (infliximab or adalimumab with any of the above), 5. Surgery (major abdominal surgery due to IBD regardless of medical treatment prior to surgery). Initial treatment was defined as the highest treatment step reached within the first three months from diagnosis. Patients' data were entered into the web-based EpiCom database (www.epicom-ecco.eu). Patients younger than 15 years were included as pediatric patients.

3. The incidence of smoking and its association with disease phenotype, medical and surgical therapy in the population-based IBD database from Veszprém county

IBD patients diagnosed between 01.01.1977 and 31.12.2008 were included in the study. Patients were followed up until 31.12.2010 or until death. The included IBD patients were diagnosed in seven hospitals and outpatients units from Veszprém county, Hungary. The data collection between 1977 and 1985 was retrospective except the center in Veszprém, and from 1985, it was prospective in all participating centers. Patients were diagnosed according to the Lennard-Jones criteria and the disease

phenotype was defined according to the Montreal Classification. Current smoking was defined as at least 7 cigarettes per week for at least 6 months at diagnosis or during follow-up. Smoking cessation was defined as complete abstinence for at least 1 year of duration. Past smoking was defined as complete abstinence for at least 1 year before diagnosis. The source of national smoking data was the National Survey on Addiction Problems in Hungary 2007 (NSAPH-OLAAP, n=2710), the OLEF 2009 questionnaire for the elderly (aged >65 years, n=27746), and the OEFI Global Youth Tobacco Survey Hungary 2008 for pediatric age groups (13- to 17-year-olds, n=3861).

4. The prevalence of EIM and anaemia and their association with medical therapy and disease outcomes in the population-based IBD database from Veszprém county

Patients diagnosed between 01.01.2000 and 31.12.2012 were included in the study. The diagnostic criteria, the definition of disease phenotype and the methodology of inclusion and follow-up of patients were corresponding to the concept of the above-mentioned study from the population-based IBD database from Veszprém county. Any condition suggesting an EIM was investigated by a specialist: rheumatologic EIMs as peripheral arthritis, axial arthropathy including ankylosing spondylitis were diagnosed by rheumatologists, cutaneous EIMs as erythema nodosum and pyoderma gangraenosum by dermatologists and ocular EIMs as uveitis and iridocyclitis by ophthalmologists. For the diagnosis of anaemia the definitions from the World Health Organization (WHO) were used.

5. The incidence of VTE and their association with disease phenotype, medical and surgical therapy in the population-based IBD database from Veszprém county

In this study, 1708 IBD patients diagnosed between 01.01.1977 and 31.12.2012 were included. The diagnostic criteria, the definition of disease phenotype and the methodology of inclusion and follow-up of patients were corresponding to the concept of the above-mentioned studies from the population-based IBD database from Veszprém county. For the confirmation of deep venous thrombosis (DVT) compression ultrasound, while for the confirmation of pulmonary embolism (PE) or thrombosis with other location computed tomography was used.

Results

1-2. The incidence of IBD, disease phenotype, medical therapy and disease outcomes in the multicenter, population-based ECCO-EpiCom study from 2011

The main annual **incidence rates** for IBD were 11.3/100 000 persons in the Eastern, 14/100 000 persons in the Western European centers and 30.3/100 000 persons in the Australian center.

No significant difference was found in the **disease location** of CD patients between the Eastern and the Western European centers ($p=0.19$). A significantly higher number of CD patients with complicated **disease behavior** (stricturing and/or penetrating±perianal involvement) were diagnosed in Eastern Europe compared to Western Europe (43% vs. 27%, $p=0.02$).

During the first three months after diagnosis, significant difference was found in the steroid use (19% vs. 34%, $p=0.02$), but not in the 5-ASA (24% vs. 19%, $p=0.32$), the immunomodulator (33% vs. 22%, $p=0.08$) and the biological use (4% vs. 8%, $p=0.31$) between the Eastern and Western European **CD patients**. Surgery was required in 17% of the Eastern European and 3% of the Western European CD patients, ($p<0.01$). In UC, significant difference was observed in the 5-ASA use (74% vs. 57% and 56%, $p<0.01$) and steroid use (17% vs. 30% and 44%, $p=0.01$) between the Eastern European and the Western European and Australian patients. The rate of immunomodulator and biological use did not differ between the Eastern and Western European UC patients (7% vs. 4%, $p=0.24$; 1% vs. 2%, $p=0.62$). One (0.4%) Western European UC patients required colectomy during the first three months after diagnosis.

During the first year after diagnosis, 9% of the Eastern European and 19% of the Western European/Australian CD patients were administered biological therapy. ($p=0.04$). In logistic regression analysis, disease behavior, perianal disease and geographic region were independent predictors for biological use (disease behavior: $p=0.003$, Odds ratio [OR]: 2.04, 95%confidence interval [CI]: 1.27–3.26; perianal disease: $p=0.008$, OR: 3.52, 95%CI: 1.39–8.94; geographic region: $p=0.02$, OR: 3.21, 95%CI: 1.21–8.5). **Surgery** rates were significantly higher among the Eastern European CD patients compared to Western Europe/Australia one year after diagnosis (24% vs. 7%, $p<0.001$). In Eastern Europe, the need for surgery was associated with ileal disease

location and stricturing disease behavior ($p\text{LogRank}_{\text{location}}=0.008$, $p\text{LogRank}_{\text{behavior}}<0.001$). **Hospitalization** rates were also higher among the Eastern European CD patients compared to Western Europe/Australia one year after diagnosis (34% vs. 21%, $p=0.02$). In UC, 5% of the Eastern European and 4% of the Western European/Australian CD patients received biological therapy ($p=0.89$). The hospitalization rates in UC patients did not differ between the Eastern European and Western European/Australian centers one year after diagnosis (16% vs. 16%, $p=0.93$). One (0,4%) Western European UC patient required colectomy.

3. The incidence of smoking and its association with disease phenotype, medical and surgical therapy in the population-based IBD database from Veszprém county

At the time of CD diagnosis, 47.2% were current smokers. The highest rate of smokers was observed among adult-onset CD patients (52.4%). Smoking was associated with an increased risk of CD (OR: 1.96, 95% CI: 1.63–2.37; $p<0.001$).

A change in disease location from ileal/colonic to ileocolonic was significantly higher among smokers compared with nonsmokers or former smokers (11.7% vs. 4.5%, OR: 2.81, 95% CI: 1.40-5.66, $p=0.003$). Similarly, current smokers were at higher risk of change in disease behavior either 5 years (change from non-stricturing-non penetrating (B1) to stricturing/penetrating (B2/B3) disease behavior: OR: 1.82, 95% CI: 1.09-3.01, $p=0.02$; or change from B1 to B2/B3 or change from B2 to B3 18.8% vs. nonsmokers and former smokers: 11.7%, OR: 1.76, 95% CI: 1.07-2.89, $p=0.02$) or 10 years after diagnosis (change from B1 to B2/B3: OR: 2.02, 95% CI: 1.30-3.16, $p=0.002$; or change from B1 to B2/B3 or change from B2 to B3: 28.0% vs. nonsmokers and former smokers: 16.9% OR: 1.91, 95% CI: 1.25-2.93, $p=0.003$).

At the time of UC diagnosis, 14.9% were current smokers. Smoking was associated with decreased risk of UC (OR: 0.33, 95% CI: 0.27-0.41, $p<0.001$). Extensive disease at diagnosis was more frequent in smokers (33.1% vs. 22.9%, OR: 1.67, 95% CI: 1.12-2.47, $p=0.01$). In a univariate (4.6% vs. 1.5%, $p=0.07$) and Kaplan-Meier analysis ($p\text{LogRank}=0.08$) there was a tendency for current smoking to be protective against colectomy.

4. The prevalence of EIM and anaemia and their association with medical therapy and disease outcomes in the population-based IBD database from Veszprém county

EIMs were present in 30% (n=100) of **CD** patients. In a logistic regression model, the presence of EIMs was significantly associated with the need for steroid and azathioprine (AZA). ($p_{\text{steroid}} < 0.001$, $p_{\text{AZA}} = 0.01$). In Kaplan-Meier analysis, IBD-associated hospitalization and the change in disease behavior was not associated with the presence of EIM ($p_{\text{LogRank}} = 0.592$ és $p_{\text{LogRank}} = 0.762$).

EIMs were present in 17.3% (n=60) of the **UC** patients. The association between EIMs and the need for steroids and AZA remained significant in a logistic regression model ($p_{\text{steroid}} < 0.001$, $p_{\text{AZA}} = 0.002$). In Kaplan-Meier analysis, there was a significant association between the presence of EIMs and the cumulative probability of IBD-related hospitalization ($p_{\text{LogRank}} = 0.002$).

Anaemia was present in 56.7% of the **CD** and 30.2% of the **UC** patients. In a logistic regression model, the need for steroids and AZA and the presence of anaemia remained significant in both **CD** and **UC** patients (**CD**: $p_{\text{steroid}} < 0.001$, $p_{\text{AZA}} < 0.001$; **UC**: $p_{\text{steroid}} < 0.001$, $p_{\text{AZA}} = 0.001$). In Kaplan-Meier analysis, there was a significant association between the presence of anaemia and the time to change in disease behavior ($p_{\text{LogRank}} < 0.001$) and major IBD-related surgery ($p_{\text{LogRank}} < 0.001$) in **CD**, and with the time to IBD-associated hospitalization in both **CD** and **UC** ($p_{\text{LogRank}} = 0.001$, $p_{\text{LogRank}} = 0.001$).

5. The incidence of VTE and their association with disease phenotype, medical and surgical therapy in the population-based IBD database from Veszprém county

In this study, 22 VTE events were identified in 19 IBD patients (5 **CD** and 14 **UC** patients). **The incidence of VTE** in IBD was 1.03/1000 patient-years with no difference between **CD** and **UC**: **CD**: 0.94/1000 patient-years (0.43-2.05), **UC**: 1.10/1000 patient-years (0.67-1.79). The cumulative probability to develop VTE in IBD was 0.7%, 1.2% and 1.5% 5, 10 and 15 years after diagnosis. The incidence of VTE was 1.34/1000 patient-years in males and 0.73/1000 patient-years in females ($p = 0.03$, IRR: 2.94, 95%CI: 1.06-8.15). The risk for developing VTE was associated with extensive disease (OR: 3.25, 95%CI: 1.13-9.35), presence of fulminant episodes during the disease course

(OR: 4.15, 95%CI: 1.28-13.5), smoking (OR: 3.46, 95%CI: 1.14-10.5) and the need for steroids (OR: 2.97, 95%CI: 0.99-8.92) in UC.

Conclusions

1. According to the ECCO-EpiCom study from 2011, the incidence of IBD was still higher in Western Europe compared to Eastern Europe, but similar incidence rates to those of the Western European centers were found in Hungary.
2. The use of biological therapy in CD was lower in Eastern Europe compared to Western Europe/Australia within the first year after diagnosis.
3. Hospitalization and surgery rates were higher among the Eastern European CD patients compared to the Western European/Australian CD patients.
4. In the population-based study from the IBD database from Veszprém county, smoking was associated with higher risk for developing CD and with lower risk for developing UC most prominently in adult-onset patients.
5. In CD, smoking was associated with the change in disease location and disease behavior.
6. In UC, smoking was associated with lower risk of colectomy. In addition, higher relapse rate was observed in nonsmokers.
7. The presence of EIM was associated with the need for hospitalization in UC and with the need for steroids and AZA in both CD and UC. The presence of anaemia was associated with the change in disease behavior and need for surgery in CD, and with the need for steroids, AZA and hospitalization in both CD and UC.
8. In UC, VTE was associated with active disease, extensive disease, presence of fulminant episodes, the need for steroid and smoking.

Bibliography

Bibliography of the candidate's publications related to the PhD thesis

Vegh Z, Kurti Z, Gonczi L, Golovics PA, Lovasz BD, Szita I, Balogh M, Pandur T, Vavricka SR, Rogler G, Lakatos L, Lakatos PL
Association of extraintestinal manifestations and anaemia with disease outcomes in patients with inflammatory bowel disease
SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY 51:(7) pp. 848-854. (2016)

Vegh Z, Golovics PA, Lovasz BD, Kurti Z, Geese KB, Szita I, Balogh M, Pandur T, Lakatos L, Lakatos PL
Low incidence of venous thromboembolism in inflammatory bowel diseases: prevalence and predictors from a population-based inception cohort
SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY 50:(3) pp. 306-311. (2015)

Vegh Z, Burisch J, Pedersen N, Kaimakliotis I, Duricova D, Bortlik M, Vinding KK, Avnstrøm S, Olsen J, Nielsen KR, Katsanos KH, Tsianos EV, Lakatos L, Schwartz D, Odes S, D'Inca R, Beltrami M, Kiudelis G, Kupcinskas L, Jucov A, Turcan S, Barros LF, Magro F, Lazar D, Goldis A, de Castro L, Hernandez V, Niewiadomski O, Bell S, Langholz E, Munkholm P, Lakatos PL; EpiCom-group
Treatment steps; surgery and hospitalization rates during the first year of follow-up in patients with inflammatory bowel diseases from the 2011 ECCO-EpiCom inception cohort
JOURNAL OF CROHNS & COLITIS 9:(9) pp. 747-753. (2015)

Vegh Z, Burisch J, Pedersen N, Kaimakliotis I, Duricova D, Bortlik M, Avnstrøm S, Vinding KK, Olsen J, Nielsen KR, Katsanos KH, Tsianos EV, Lakatos L, Schwartz D, Odes S, Lupinacci G, De Padova A, Jonaitis L, Kupcinskas L, Turcan S, Tighineanu O, Mihu I, Barros LF, Magro F, Lazar D, Goldis A, Fernandez A, Hernandez V, Niewiadomski O, Bell S, Langholz E, Munkholm P, Lakatos PL; EpiCom-group
Incidence and initial disease course of inflammatory bowel diseases in 2011 in Europe and Australia: results of the 2011 ECCO-EpiCom inception cohort
JOURNAL OF CROHNS & COLITIS 8:(11) pp. 1506-1515. (2014)

Lakatos PL¹, Vegh Z¹, Lovasz BD, David G, Pandur T, Erdelyi Z, Szita I, Mester G, Balogh M, Szipocs I, Molnar C, Komaromi E, Golovics PA, Mandel M, Horvath A, Szathmari M, Kiss LS, Lakatos L
Is current smoking still an important environmental factor in inflammatory bowel diseases? Results from a population-based incident cohort
INFLAMMATORY BOWEL DISEASES 19:(5) pp. 1010-1017. (2013)

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Other publications

Baji P, Gulácsi L, Brodszky V, Végh Z, Danese S, Irving PM, Peyrin Biroulet L, Schreiber S, Rencz F, Lakatos PL, Péntek M

Cost-effectiveness of biological treatment sequences for fistulising Crohn's disease across Europe

UNITED EUROPEAN GASTROENTEROLOGY JOURNAL 6:(2) pp. 310-321. (2018)

Balint Anita, Rutka Mariann, Kolar Martin, Bortlik Martin, Duricova Dana, Hrubá Veronika, Lukas Martin, Mitrova Katarina, Malickova Karin, Lukas Milan, Szepes Zoltan, Nagy Ferenc, Palatka Karoly, Lovas Szilvia, Végh Zsuzsanna, Kurti Zsuzsanna, Csontos Agnes, Miheller Pal, Nyari Tibor, Bor Renata, Milassin Agnes, Fabian Anna, Szanto Kata, Lakatos Peter L, Molnar Tamas, Farkas Klaudia

Infliximab biosimilar CT-P13 therapy is effective in maintaining endoscopic remission in ulcerative colitis - results from multicenter observational cohort

EXPERT OPINION ON BIOLOGICAL THERAPY 18:(11) pp. 1181-1187. (2018)

Burisch J, Stefania Chetcuti Zammit SC, Ellul P, Toca A, Turcan S, Duricova D, Bortlik M, Andersen KW, Andersen V, Kaimakliotis IP, Fumery M, Gower-Rousseau C, D'Inca R, Valpiani D, Goldis A, Brinar M, Cukovic-Cavka S, Oksanen P, Collin P, Magro F, Misra R, Naila Arebi N, Eriksson C, Halfvarson J, Kievit HAL, Pedersen N, Kjeldsen J, Myers S, Sebastian S, Katsanos KH, Christodoulou DK, Midjord J, Nielsen KR, Kiudelis G, Kupcinkas L, Nikulina I, Belousova E, Schwartz D, Odes S, Salupere R, Fernandez A, Hernandez V, Végh Z, Lakatos PL, Langholz E, Munkholm P

Disease course of inflammatory bowel disease unclassified in a European population-based inception cohort – an Epi-IBD study

JOURNAL OF GASTROENTEROLOGY AND HEPATOLOGY 33 p.

DOI: 10.1111/jgh.14563 (2018)

Burisch J, Katsanos KH, Christodoulou DK, Barros L, Magro F, Pedersen N, Kjeldsen J, Végh Z, Lakatos PL, Eriksson C, Halfvarson J, Fumery M, Gower-Rousseau C, Brinar M, Cukovic-Cavka S, Nikulina I, Belousova E, Myers S, Sebastian S, Kiudelis G, Kupcinkas L, Schwartz D, Odes S, Kaimakliotis IP, Valpiani D, D'Inca R, Salupere R, Zammit SC, Ellul P, Duricova D, Bortlik M, Goldis A, Kievit HAL, Toca A, Turcan S, Midjord J, Nielsen KR, Andersen KW, Andersen V, Misra R, Arebi N, Oksanen P, Collin P, de Castro L, Hernandez V, Langholz E, Munkholm P, Epi-IBD Group

Natural Disease Course of Ulcerative Colitis During the First Five Years of Follow-up in a European Population-based Inception Cohort-An Epi-IBD Study

JOURNAL OF CROHNS & COLITIS 13: (2) pp. 198-208. (2018)

Burisch J, Kiudelis G, Kupcinkas L, Kievit HAL, Andersen KW, Andersen V, Salupere R, Pedersen N, Kjeldsen J, D'Inca R, Valpiani D, Schwartz D, Odes S, Olsen J, Nielsen KR, Végh Z, Lakatos PL, Toca A, Turcan S, Katsanos KH, Christodoulou DK, Fumery M, Gower-Rousseau C, Zammit SC, Ellul P, Eriksson C, Halfvarson J, Magro FJ, Duricova D, Bortlik M, Fernandez A, Hernández V, Myers S, Sebastian S, Oksanen P, Collin P, Goldis A, Misra R, Arebi N, Kaimakliotis IP, Nikulina I, Belousova E, Brinar M, Cukovic-Cavka S, Langholz E, Munkholm P, Epi-IBD group

Natural disease course of Crohn's disease during the first 5 years after diagnosis in a European population-based inception cohort: an Epi-IBD study

GUT 67 DOI: gutjnl-2017-315568. 11 p. (2018)

Goncz L, Kurti Z, Golovics PA, Lovasz BL, Menyhart O, Seres A, Sumegi LD, Gal A, Ilias A, Papp J, Gecse KB, Bessisow T, Afif W, Bitton A, Végh Z, Lakatos PL

Quality of care indicators in inflammatory bowel disease in a tertiary referral center with open access and objective assessment policies

DIGESTIVE AND LIVER DISEASE 50:(1) pp. 37-41. (2018)

Gulacsi L, Pentek M, Rencz F, Brodszky V, Baji P, Vegh Z, Gecse KB, Danese S, Peyrin-Biroulet L, Lakatos PL

Biosimilars for the management of inflammatory bowel diseases: economic considerations

CURRENT MEDICINAL CHEMISTRY DOI: 10.2174/0929867324666170406112304 11 p. (2018)

Ilias A, Lovasz BD, Gonczi L, Kurti Z, Vegh Z, Sumegi LD, Golovics PA, Rudas G, Lakatos, PL

Optimizing patient management in Crohn's disease in a tertiary referral center: the impact of fast-track MRI on patient management and outcomes

JOURNAL OF GASTROINTESTINAL AND LIVER DISEASES 27:(4) pp. 391-397. (2018)

Shah SC, Khalili H, Gower-Rousseau C, Olen O, Benchimol EI, Lyng E, Nielsen KR, Brassard P, Vutcovici M, Bitton A, Bernstein CN, Leddin D, Tamim H, Stefansson T, Loftus EV Jr, Moum B, Tang W, Ng SC, Geary R, Sincic B, Bell S, Sands BE, Lakatos PL, Végh Z, Ott C, Kaplan GG, Burisch J, Colombel JF

Sex-based Differences in Incidence of Inflammatory Bowel Diseases-Pooled Analysis of Population-based Studies from Western Countries.

GASTROENTEROLOGY 155 : 4 pp. 1079-1089e3. (2018)

Vegh Z, Kurti Z, Golovics PA, Lakatos PL

Can we predict disease course with clinical factors?

CURRENT DRUG TARGETS 19:(7) pp. 791-797. (2018)

Zammit Stefania Chetcuti, Ellul Pierre, Girardin Giulia, Valpiani Daniela, Nielsen Kari R, Olsen Jongerd, Goldis Adrian, Lazar Daniela, Shonova Olga, Novakova Marie, Sebastian Shaji, Whitehead Emma, Carmona Amalia, Martinez-Cadilla Jesus, Dahlerup Jens F, Kievit Adriana LH, Throsgaard Niels, Katsanos Konstantinos H, Christodolou Dimitros K, Magro Fernando, Salupere Riina, Pedersen Natalia, Kjeldsen Jens, Carlsen Katrine, Ioannis Kaimakliotis, Bergemalm Daniel, Halfvarson Jonas, Duricova Dana, Bortlik Martin, Collin Pekka, Oksanen Pia, Kiudelis Gediminas, Kupcinskas Limas, Kudsk Karen, Andersen Vibeke, O'Morain Colm, Bailey Yvonne, Doron Schwartz, Shmuel Odes, Almer Sven, Arebi Naila, Misra Ravi, Cukovic-Cavka Silvija, Brinar Marko, Munkholm Pia, Vegh Zsuzsanna, Burisch Johan

Vitamin D deficiency in a European inflammatory bowel disease inception cohort: an Epi-IBD study

EUROPEAN JOURNAL OF GASTROENTEROLOGY AND HEPATOLOGY 30:(11) pp. 1297-1303. (2018)

Zsuzsanna Kurti, Akos Ilias, Lorant Gonczi, Zsuzsanna Vegh, Petra Fadgyas-Freyler, Gyula Korponay, Petra A Golovics, Barbara D Lovasz, Peter L Lakatos

Therapeutic preferences and outcomes in newly diagnosed patients with Crohn's diseases in the biological era in Hungary: a nationwide study based on the National Health Insurance Fund database

BMC GASTROENTEROLOGY 2018: pp. 18-23. (2018)

Balint A, Rutka M, Vegh Z, Kurti Z, Gecse KB, Banai J, Bene L, Gasztonyi B, Kristof T, Lakatos L, Miheller P, Palatka K, Patai A, Salamon A, Szamosi T, Szepes Z, Toth GT, Vincze A, Bor R, Milassin A, Fabian A, Nagy F, Kolar M, Bortlik M, Duricova D, Hrubá V, Lukas M, Mitrova K, Malickova K, Lukas M, Lakatos PL, Molnar T, Farkas K

Frequency and Characteristics of Infusion Reactions during Biosimilar Infliximab Treatment in Inflammatory Bowel Diseases: results from Central European nationwide cohort

EXPERT OPINION ON DRUG SAFETY 16:(8) pp. 885-890. (2017)

Burisch J, Vegh Z, Katsanos KH, Christodoulou DK, Lazar D, Goldis A, O'Morain C, Fernandez A, Pereira S, Myers S, Sebastian S, Pedersen N, Olse J, Rubek Nielsen K, Schwartz D, Odes S, Almer S, Halfvarson J, Turk N, Cukovic-Cavka S, Nikulina I, Belousova E, Duricova D, Bortlik M, Shonová O, Salupere R, Barros L, Magro F, Jonaitis L, Kupcinskas L, Turcan S, Kaimakliotis I, Ladefoged K, Kudsk K, Andersen V, Vind I, Thorsgaard N, Oksanen P, Collin P, Dal Piaz G, Santini A, Niewiadomski O, Bell S, Moum B, Arebi N, Kjeldsen J, Carlsen K, Langholz E, Lakatos PL, Munkholm P, Gerdes LU, Dahlerup JF, EpiCom study group

Occurrence of anaemia in the first year of inflammatory bowel disease in a European population-based inception cohort - An ECCO-EpiCom study

JOURNAL OF CROHNS & COLITIS 11:(10) pp. 1213-1222. (2017)

Farkas K, Rutka M, Ferenci T, Nagy F, Bálint A, Bor R, Milassin Á, Fábíán A, Szántó K, Vegh Z, Kürti Z, Lakatos PL, Szepes Z, Molnár T

Infliximab biosimilar CT-P13 therapy is effective and safe in maintaining remission in Crohn's disease and ulcerative colitis – experiences from a single center

EXPERT OPINION ON BIOLOGICAL THERAPY 17:(11) pp. 1325-1332. (2017)

Gonczi L, Gecse KB, Vegh Z, Kurti Z, Rutka M, Farkas K, Golovics PA, Lovasz BD, Banai J, Bene L, Gasztonyi B, Kristof T, Lakatos L, Miheller P, Nagy F, Palatka K, Papp M, Patai A, Salamon A, Szamosi T, Szepes Z, Toth GT, Vincze A, Szalay B, Molnar T, Lakatos PL

Long-term Efficacy; Safety; and Immunogenicity of Biosimilar Infliximab After One Year in a Prospective Nationwide Cohort

INFLAMMATORY BOWEL DISEASES 23:(11) pp. 1908-1915. (2017)

Gonczi L, Kurti Z, Rutka M, Vegh Z, Farkas K, Lovasz BD, Golovics PA, Gecse KB, Szalay B, Molnar T, Lakatos PL

Drug persistence and need for dose intensification to adalimumab therapy; the importance of therapeutic drug monitoring in inflammatory bowel diseases

BMC GASTROENTEROLOGY 17:(1) 97. 7 p. (2017)

Gonczi L, Vegh Z, Golovics PA, Rutka M, Gecse KB, Bor R, Farkas K, Szamosi T, Bene L, Gasztonyi B, Kristóf T, Lakatos L, Miheller P, Palatka K, Papp M, Patai A, Salamon A, Tóth GT, Vincze A, Biro E, Lovasz BD, Kurti Z, Szepes Z, Molnár T, Lakatos PL

Prediction of short- and medium-term efficacy of biosimilar infliximab therapy. Do trough levels and antidrug antibody levels or clinical and biochemical markers play a more important role?

JOURNAL OF CROHNS & COLITIS 11:(6) pp. 697-705. (2017)

Pedersen N, Ankersen DV, Felding M, Wachmann H, Vegh Z, Molzen L, Burisch J, Andersen JR, Munkholm P

Low-FODMAP diet reduces irritable bowel symptoms in patients with inflammatory bowel disease

WORLD JOURNAL OF GASTROENTEROLOGY 23:(18) pp. 3356-3366. (2017)

Vegh Z, Kurti Z, Lakatos PL

Real-Life Efficacy, Immunogenicity and Safety of Biosimilar Infliximab

DIGESTIVE DISEASES 35:(1-2) pp. 101-106. (2017)

Vegh Z, Kurti Z, Lakatos P

Epidemiology of inflammatory bowel diseases from West to East

JOURNAL OF DIGESTIVE DISEASES 18:(2) pp. 92-98. (2017)

Gecse KB, Vegh Z, Lakatos, PL
Optimizing biological therapy in Crohn's disease
EXPERT REVIEW OF GASTROENTEROLOGY & HEPATOLOGY 10:(1) pp. 37-45. (2016)

Gönczi L, Kürti Z, Golovics P, Végh Z, Lovász B, Dorkó A, Seres A, Sümegi L, Menyhárt O, Kiss L, Papp J, Gecse K, Lakatos PL
A felső és alsó endoszkópiák indikációja, a diagnózisok megoszlása és minőségi mutatók 2010–2011-ben a Semmelweis Egyetem I. Belgyógyászati Klinikáján [Indications, diagnoses and quality markers in upper and lower endoscopies in 2010 and 2011 at the 1st Department of Medicine, Semmelweis University, Budapest]
ORVOSI HETILAP 157:(52) pp. 2074-2081. (2016)

Kurti Z, Vegh Z, Golovics PA, Fadgyas-Freyler P, Gecse KB, Gönczi L, Gimesi-Orszagh J, Lovasz BD, Lakatos PL
Nationwide prevalence and drug treatment practices of inflammatory bowel diseases in Hungary: A population-based study based on the National Health Insurance Fund database. **DIGESTIVE AND LIVER DISEASE** 48:(11) pp. 1302-1307. (2016)

Kurti Z, Vegh Z, Golovics PA, Lakatos PL
„Treat to target” – lessons learnt
DIGESTIVE DISEASES 34:(1-2) pp. 147-152. (2016)

Maagaard L, Ankersen DV, Vegh Z, Burisch J, Jensen L, Pedersen N, Munkholm, P
Follow-up of patients with functional bowel symptoms treated with a low FODMAP diet
WORLD JOURNAL OF GASTROENTEROLOGY 22:(15) pp. 4009-4019. (2016)

Vegh Z, Kurti Z, Lakatos PL
Adenomatous polyps in ulcerative colitis and colonic Crohn's disease: less frequent, but does this change surveillance strategy?
ENDOSCOPY 48:(3) pp. 210-212. (2016)

Golovics PA, Lakatos L, Mandel MD, Lovasz BD, Vegh Z, Kurti Z, Szita I, Kiss LS, Balogh M, Pandur T, Lakatos PL
Does Hospitalization Predict the Disease Course in Ulcerative Colitis? Prevalence and Predictors of Hospitalization and Re-Hospitalization in Ulcerative Colitis in a Population-based Inception Cohort (2000-2012)
JOURNAL OF GASTROINTESTINAL AND LIVER DISEASES 24: pp. 287-292. (2015)

Golovics PA, Lakatos L, Mandel MD, Lovasz BD, Vegh Z, Kurti Z, Szita I, Kiss LS, Pandur T, Lakatos PL
Prevalence and predictors of hospitalization in Crohn's disease in a prospective population-based inception cohort from 2000-2012
WORLD JOURNAL OF GASTROENTEROLOGY 21:(23) pp. 7272-7280. (2015)

Kurti Z, Lovasz BD, Gecse KB, Balint A, Farkas K, Morocza-Szabo A, Gyurcsanyi A, Kristof K, Vegh Z, Gönczi L, Kiss LS, Golovics PA, Lakatos L, Molnar T, Lakatos PL
Tuberculin skin test and Quantiferon in BCG vaccinated; immunosuppressed patients with moderate-to-severe inflammatory bowel disease
JOURNAL OF GASTROINTESTINAL AND LIVER DISEASES 24:(4) pp. 467-472. (2015)

Miheller P, Csontos AA, Vegh Z, Gelley A, Lakatos, PL
Novel Drug Therapies for the Treatment of Crohn's Disease
JOURNAL OF GASTROINTESTINAL & DIGESTIVE SYSTEM 5: (3) pp. 1000297 (2015)

Burisch J, Vegh Z, Pedersen N, Čuković-Čavka S, Turk N, Kaimakliotis I, Duricova D, Bortlik M, Shonová O, Thorsgaard N, Krabbe S, Andersen V, Dahlerup JF, Kjeldsen J, Salupere R, Olsen J, Nielsen KR, Manninen P, Collin P, Katsanos KH, Tsianos EV, Ladefoged K, Ragnarsson G, Björnsson E, Bailey Y, O'Morain C, Schwartz D, Odes S, Politi P, Santini A, Kiudelis G, Kupcinskas L, Turcan S, Magro F, Barros L, Lazar D, Goldis A, Nikulina I, Belousova E, Sanromán L, Martinez-Ares D, Almer S, Zhulina Y, Halfvarson J, Arebi N, Houston Y, Sebastian S, Langholz E, Lakatos PL, Munkholm P, EpiCom group
Health care and patients' education in a European inflammatory bowel disease inception cohort – An ECCO-EpiCom study
JOURNAL OF CROHNS & COLITIS 8: (8) pp. 811-818. (2014)

Lovasz BD, Lakatos L, Horvath A, Pandur T, Erdelyi Z, Balogh M, Szipocs I, Vegh Z, Veres G, Müller KE, Golovics PA, Kiss LS, Mandel MD, Lakatos PL
Incidence rates and disease course of paediatric inflammatory bowel diseases in Western Hungary between 1977 and 2011
DIGESTIVE AND LIVER DISEASE 46:(5) pp. 405-411. (2014)

Mandel MD, Balint A, Golovics PA, Vegh Z, Mohas A, Szilagyi B, Szabo A, Kurti Z, Kiss LS, Lovasz BD, Geese K, Farkas K, Molnar T, Lakatos PL
Decreasing trends in hospitalizations during anti-TNF therapy are associated with time to anti-TNF therapy: results from two referral centers
DIGESTIVE AND LIVER DISEASE 46:(11) pp. 985-990. (2014)

Pedersen N, Vegh Z, Burisch J, Jensen L, Ankersen DV, Felding M, Andersen NN, Munkholm P
Ehealth monitoring in irritable bowel syndrome patients treated with low fermentable oligo-; di-; mono-saccharides and polyols diet
WORLD JOURNAL OF GASTROENTEROLOGY 20: (21) pp. 6680-6684. (2014)

Pedersen N, Thielsen P, Martinsen L, Bennedsen M, Haaber A, Langholz E, Végh Z, Duricova D, Jess T, Bell S, Burisch J, Munkholm P
eHealth: individualization of mesalazine treatment through a self-managed web-based solution in mild-to-moderate ulcerative colitis
INFLAMMATORY BOWEL DISEASES 20: (12) pp. 2276-2285. (2014)

Pedersen N, Andersen NN, Végh Z, Jensen L, Ankersen DV, Felding M, Simonsen MH, Burisch J, Munkholm P
Ehealth: Low FODMAP diet vs Lactobacillus rhamnosus GG in irritable bowel syndrome
WORLD JOURNAL OF GASTROENTEROLOGY 20: (43) pp. 16215-16226. (2014)

Golovics PA, Lakatos L, Nagy A, Pandur T, Szita I, Balogh M, Molnar C, Komaromi E, Lovasz BD, Mandel M, Veres G, Kiss LS, Vegh Z, Lakatos, PL
Is early limited surgery associated with a more benign disease course in Crohn's disease?
WORLD JOURNAL OF GASTROENTEROLOGY 19:(43) pp. 7701-7710. (2013)

Kiss LS, Lovasz BD, Golovics PA, Vegh Z, Farkas K, Molnar T, Palatka K, Papp M, Mohas A, Szilagyik BK, Fekete SA, Mandel M, Lakatos PL

Levels of Anti-Double-Strained DNA but not Antinuclear Antibodies are Associated with Treatment Efficacy and Adverse Outcomes in Crohn's Disease Patients Treated with anti-TNF α

JOURNAL OF GASTROINTESTINAL AND LIVER DISEASES 22:(2) pp. 135-140. (2013)

Lakatos PL, Lovasz BD, David G, Pandur T, Erdelyi Z, Mester G, Balogh M, Szipoes I, Molnar C, Komaromi E, Golovics PA, Vegh Z, Mandel M, Horvath A, Szathmari M, Kiss LS, Lakatos L

The risk of lymphoma and immunomodulators in patients with inflammatory bowel diseases. Results from a population-based cohort in Eastern Europe

JOURNAL OF CROHNS & COLITIS 7:(5) pp. 385-391. (2013)

Lovasz BD, Lakatos L, Golovics PA, David G, Pandur T, Erdelyi Z, Balogh M, Szita I, Molnar C, Komaromi E, Vegh Z, Mandel MD, Kiss LS, Lakatos PL

Risk of colorectal cancer in CD patients with colonic involvement and stenosing disease in a population-based cohort from Hungary

JOURNAL OF GASTROINTESTINAL AND LIVER DISEASES 22: 3 pp. 265-268. (2013)

Lovasz BD, Lakatos L, Horvath A, Szita I, Pandur T, Mandel M, Vegh Z, Golovics PA, Mester G, Balogh M, Molnar C, Komaromi E, Kiss LS, Lakatos PL

Evolution of disease phenotype in adult and pediatric onset Crohn's disease in a population-based cohort

WORLD JOURNAL OF GASTROENTEROLOGY 19:(14) pp. 2217-2226. (2013)

Lovasz BD, Golovics PA, Vegh Z, Lakatos PL

New trends in inflammatory bowel disease epidemiology and disease course in Eastern Europe

DIGESTIVE AND LIVER DISEASE 45:(4) pp. 269-276. (2013)

Kiss LS, Papp M, Lovasz BD, Vegh Z, Golovics PA, Janka E, Varga E, Szathmari M, Lakatos PL

High-sensitivity C-reactive Protein for Identification of Disease Phenotype, Active Disease, and Clinical Relapses in Crohn's Disease: A Marker for Patient Classification?

INFLAMMATORY BOWEL DISEASES 18:(9) pp. 1647-1654. (2012)

Kiss LS, Szamosi T, Molnar T, Miheller P, Lakatos L, Vincze A, Palatka K, Barta Z, Gasztonyi B, Salamon A, Horvath G, Tóth GT, Farkas K, Banai J, Tulassay Z, Nagy F, Szenes M, Veres G, Lovasz BD, Vegh Z, Golovics PA, Szathmari M, Papp M, Hungarian IBD Study Group, Lakatos PL

Early clinical remission and normalisation of CRP are the strongest predictors of efficacy, mucosal healing and dose escalation during the first year of adalimumab therapy in Crohn's disease

ALIMENTARY PHARMACOLOGY & THERAPEUTICS 34:(8) pp. 911-922. (2011)