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Review of Russian Abstracts Accepted for United European Gastroenterology Week (2022)

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Aim: to present an analysis of the Russian abstracts published in the materials of the 30th. United European Gastroenterology Week (UEGW).

Key points. In the materials of 30. UEGW, 17 abstracts of Russian authors from Moscow, St. Petersburg, Novosibirsk, Kazan and other cities were published. The abstracts were devoted to topical issues of pathogenesis, diagnosis and treatment of intestinal liver and pancreatic diseases.

Conclusion. Analysis of the published abstracts testifies to the high scientific level and large practical significance of the conducted research.

Keywords: inflammatory bowel diseases, liver diseases, diagnostics **Conflict of interest:** the author declares no conflict of interest.

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Обзор российских тезисов, принятых на Объединенную Европейскую Гастроэнтерологическую Неделю (2022)

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Цель публикации. Представить анализ российских тезисов, опубликованных в материалах 30-й Объединенной Европейской Недели Гастроэнтерологии (ОЕНГ).

Основные положения. В материалах 30-й ОЕНГ было опубликовано 17 тезисов российских авторов из Москвы, Санкт-Петербурга, Новосибирска, Казани и других городов. Тезисы были посвящены актуальным вопросам патогенеза, диагностики и лечения заболеваний кишечника (запоров, изменений состава кишечной микробиоты, воспалительных заболеваний кишечника), болезням печени и поджелудочной железы.

Заключение. Анализ опубликованных тезисов свидетельствует о высоком научном уровне и большой практической значимости проведенных исследований.

Ключевые слова: воспалительные заболевания кишечника, болезни печени, диагностика **Конфликт интересов:** Автор заявляет об отсутствии конфликта интересов.

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From the 8th to the 11th October 2022, the United European Gastroenterological Week (UEGW) was held in Vienna in real-time and remote modes. Despite certain difficulties, a total of 17 abstracts of Russian authors from Moscow, St. Petersburg, Novosibirsk, Kazan and other Russian cities were accepted. They were later published in the UEG journal. There is a brief overview of these theses.

Several works have been devoted to changes in the composition of the intestinal microbiota.

So, D. Safina et al. (Kazan, Moscow) [1] investigated in healthy volunteers the relationship between the taxonomic composition of the intestinal microbiota and the use of 6 different types of food: vegetables and fruits, meat and foods high protein, high fat food, dairy products, bakery products, easily digestible carbohydrates (sugars).

The authors identified only weak and moderate reliable positive correlations: consumption of dairy products and bakery products correlated with the relative excess number of bacteria belonging to Firmicutes, meat and food with a high protein content correlated with an excess number of bacteria belonging to the type Spirochaetes. A negative association was found between the consumption of dairy products and the number of bacteria belonging to the type *Bacteroidetes*. Other statistically significant correlations have been identified between the consumption of specific foods and the overgrowth of bacteria belonging to different genera. The authors concluded that there is a link between the taxonomic composition of the gut microbiota and the consumption of specific types of food. Diet changes will allow in the future to develop personalized therapeutic strategies aimed at modifying the composition of the intestinal microbiota.

M. Sinyagina et al. (Kazan, Moscow, Berlin) [2] studied the effect of immunoglobulin A (IgA) on the commensal strain of Esherichia coli (E. coli) 1 39 1 isolated from the feces of healthy donors. The authors showed that the treatment of the strain E. coli from a healthy person IgA leads to differential expression of 218 genes. At the same time, there was a significant increase in the expression of genes encoding serum lipoprotein Iss, proteins involved in adhesion (fimbry protein type 1), invasion and formation of vesicles (bamB, nlpA), etc. IgA processing stimulated bacterial cell division by increasing the expression of the ftsQ, zapZ, zipA genes and reducing the expression of the sulA division inhibitor. At the same time, the expression of pks-ostrov genes encoding the colibactin production system (clbJ, clbI, clbE, clbC) decreased. The authors concluded that the treatment of commensal strain E. coli IgA obtained from a healthy donor increases the expression of virulence factors such as adhesion, invasion, motility, and immune stimulation, which help bacteria survive and colonize the gut.

M. Markelova et al. (Kazan) [3] presented the results of a study of the genomic diversity of strains of Faecalibacterium prausnitzii (F. prausnitzii) obtained from the gut microbiota of patients with inflammatory bowel disease and healthy volunteers, followed by sequencing of total DNA from fecal samples. Genome F. prausnitzii was found in the gut microbiota in 40 of 42 healthy individuals, in 28 of 35 patients with Crohn's disease, and in 26 of 37 patients with ulcerative colitis. Two clusters characterizing genomic diversity of F. prausnitzii were identified. The frequency of detection of strains in the first cluster in patients with Crohn's disease and ulcerative colitis was

significantly higher (respectively, 82.1 % and 80.8) % of all strains) compared with the control group (50 %). The second cluster was represented by strains of the control group of healthy individuals (50 % of all strains in control groupe, 17.9 % of strains in patients with Crohn's disease and 19.2 % of strains in patients with ulcerative colitis). Metagenomic profiling at the strain level showed that F. prausnitzii, obtained from patients with ulcerative colitis and Crohn's disease, probably produce smaller amount of butyrate, has a disturbed cell wall of bacteria and less competitiveness compared to strains from healthy volunteers, which makes it potentially possible to use strains of F. prausnitzii obtained from healthy donors as a new generation of probiotics for the treatment of inflammatory bowel diseases.

K. Shemerovsky et al. (St. Petersburg) [4] compared the incidence of comorbidities in patients with a rare (less than 7 times a week) rhythm of bowel movement (bradyentery) and individuals with a normal (at least 7 times a week) rhythm of defecation (euentery). Examining a total of 334 people, the authors showed that bowel movements in the morning were found in individuals with euentery. Examining a total of 334 people, the authors showed that defecation in the morning hours occurred in individuals with euentery. Examining a total of 334 people. 3.5 times more often than in the evening, whereas in patients with bradyentery, on the contrary, bowel movements in the morning were observed 3.2 times less often than in the evening. Arterial hypertension was found in patients with bradyentery 2.8 times more often than in persons with a normal rhythm of defecation (respectively, in 34 % and 12 % of cases). Obesity in patients with bradyentery was observed 3.4 times more often than in persons with normal body weight (respectively, in 24 % and 7 % of cases). In patients with bradyentery it is often observed clinically significant depression, the frequency of which with a pronounced form of bradyentery (1-2 bowel movements per week) reached 34 %. The authors concluded that bradyentery is often combined with arterial hypertension, obesity and depression.

V. Pilipenko et al. (Moscow) [5] studied the effectiveness of use for 10 days in patients with constipation of a non-alcoholic fermented pasteurized drink derived from kombucha and enriched with inulin and vitamins, in comparison with that in persons of the control group when taking a similar volume of water. The dynamics of complaints (dryness and bitterness in the mouth, nausea, etc.), as well as the frequency of stool (per day) and its consistency (according to Bristol scale) were evaluated.

When analyzing the dynamics of complaints, it turned out that there were no significant differences between patients of both groups in terms of changes in the severity of dyspeptic symptoms. When assessing the dynamics of the frequency of the stool and its consistency by the end of the observation period, a significant increase in the frequency of the stool and a decrease in the index of its density were noted in the main group, which was not observed in the control group. In addition, in the main group, a significant decrease in the severity of the feeling of incomplete emptying was revealed. The authors concluded that the use of a pasteurized fermented soft drink derived from kombucha and enriched with inulin and vitamins leads to the normalization of the frequency and consistency of stool.

Several theses were devoted to inflammatory bowel diseases.

M. Kruchinina et al. (Novosibirsk) [6] studied the possibility of using the determination of the level of fatty acids of erythrocyte and serum membranes for the purpose of differential diagnosis between various forms of inflammatory bowel diseases (ulcerative colitis, Crohn's disease, unclassified colitis). Significant parameters in the differential diagnosis between active ulcerative colitis and exacerbation of Crohn's disease were indicators serum fatty acid content: elaidic, docosatetraenoic, docodieny, eicosapentaenoic, omega-3 to omega-6 ratio, the sum of two omega-3 polyunsaturated fatty acids — eicosapentaenoic and docosahexaenoic acids, content of lauric fatty acid in membranes of erythrocytes.

When conducting a differential diagnosis between active ulcerative colitis and exacerbation of unclassified colitis, the content of the following fatty acids was significant: alpha-linolenic, saturated (pentadecane, palmitic, stearic, arachnic), monounsaturated (palmitoleic, oleic), omega-6 (hexadecadien, arachidonic) fatty acids. Determining the level of fatty acids also helped in distinguishing between the active course of Crohn's disease and exacerbation of unclassified colitis. According to the authors, the proposed method may be promising in conducting a differential diagnosis between different forms of inflammatory bowel disease.

E. Lomakina et al. (Moscow) [7] conducted a comparative assessment of the nature of structural changes in the pancreas using endosonography according to Rosemont criteria in 24 patients with inflammatory bowel diseases (ulcerative colitis and Crohn's disease) without obvious clinical signs of pancreatic lesions and 56 patients with chronic pancreatitis and showed that in these groups of patients different structural changes

in the pancreas are detected. In patients with inflammatory bowel diseases, parenchymal changes in the pancreas (hyperechoic cords, its hyperechoic contour, areas of adjacent lobular structures) were dominated. At the same time, obvious chronic pancreatitis was diagnosed in 25 % of cases, probable — in 25 % of cases, doubtful — in 33.3 % of patients. In the group of patients with chronic pancreatitis, changes in the ducts prevailed (expansion of the main pancreatic duct, calcifications in it and lateral branches). Given the high frequency of structural changes in the pancreas in inflammatory bowel diseases, the authors propose to consider latent signs of pancreatitis as extraintestinal manifestations of ulcerative colitis and Crohn's disease.

O. Knyazev et al. (Moscow) [8] studied the incidence of thromboembolic complications and their relationship with the level of D-dimer in patients with severe total ulcerative colitis, as well as the role of low molecular weight heparin in their prevention. Thromboembolic complications that did not lead to death were observed in 8.3 % of patients. The level of D-dimer in this group ranged from 1.0 to 3.8 ug/ml (at normal values: 0.0-0.5 ug/ml). In patients without thromboembolic complications, the level of D-dimer was in the range of 0.1-1.8 ug/ml. The risk of thromboembolic complications was higher in the group of patients with D-dimer content of more than 0.5 ug/ml. After the use of low molecular weight heparin the frequency of thromboembolic complications decreased from 14.3 % (in 2019) to 4.3 % (in 2020) The authors concluded that there is a strict correlation between the level of D-dimer and the risk of thromboembolic complications, as well as noticed its significant decrease during the treatment with low molecular weight heparin.

In his other work **O. Knyazev et al.** (Moscow) [9] determined the concentration of zonulin (a protein that reflects the permeability of the intestinal wall) in the feces of patients with inflammatory bowel disease (IBD) with and without COVID-19 infection. The authors examined 34 patients with IBD without COVID-19 infection and 19 patients with IBD who had COVID-19 in the acute period. The level of zonulin < 83.15 ng/ml was considered as normal, 83.15-110.0 ng/ml – as elevated, > 110.0 ng/ml - as high. Fecal zonulin indicators in patients with exacerbation of IBD without COVID-19 ranged from 186.4 to 563.9 ng/ml (on average -333.4 ± 16.9 ng/ml). In patients with exacerbation of IBD and the presence of infection COVID-19, fluctuations in the level of zonulin in the feces from 321.8 to 598.3 ng/ml with its average value $464.9 \pm 16.4 \text{ ng/ml}$ (p = 0.000001) were detected. Based on the obtained results, the

authors concluded that in patients with IBD with concomitant COVID-19 infection in the acute period the concentration of fecal zonulin is significantly higher than in cases of its absence, which indicates a higher permeability of the intestinal wall in such patients.

I. Rasmagina et al. (St. Petersburg) [10] presented the results of a study conducted to optimize existing methods for diagnosing of inflammatory bowel disease (IBD) and create a physician decision support system (PDSS) based on artificial intelligence. The authors analyzed medical histories of 300 inpatients and outpatients (100 in each group) suffering from ulcerative colitis (UC), Crohn's disease (CD), and irritable bowel syndrome (IBS). To identify markers that could help in the differential diagnosis between CD, UC and IBS, complaints, anamnesis data and laboratory parameters were evaluated. A PDSS was developed based on the modified VGG16 convolutional neural network (CNN) with fast-access connections. The results showed that the distinguishing markers between IBD and IBS were loose stools, weight loss, C-reactive protein (CRP) levels and fecal calprotectin (p < 0.05). When conducting a differential diagnosis between the forms of IBD, a positive correlation was found between CD and the presence of extraintestinal, perianal manifestations and anemia (p < 0.05), as well as between UC and the presence of blood in the stool and leukocytosis (p < 0.05). The authors concluded that PDSS using CNN can be considered as an auxiliary tool to improve the accuracy of IBD diagnosis, however, further research is required with a combination of clinical, laboratory and endoscopic data.

I. Agranovich et al. (Saratov) [11] studied the relationship between the permeability of the intestinal mucosa and the permeability of the bloodbrain barrier (BBB) in rats with stress-induced metastatic adenocarcinoma of the colon (SIAC), caused by prolonged (for 9 months) combined exposure on animals of social stress (overpopulation) and a daily diet, including toluidine (2 g/kg) in food and water with nitrites (2 g/l). The results obtained by the authors showed that all rats with SIAC had a high permeability of mesenteric blood and lymphatic vessels, which was accompanied by a decrease in the expression of tight contact proteins (such as Zonula-1, Claudin-5 and adhesion molecules). In rats with SIACs and metastatic spread, in contrast to healthy animals, a high permeability of the BBB was found, accompanied by a decrease in expression. Zonula-1, Claudin-5 and adhesion molecules in the brain. The authors concluded that the high permeability of the BBB is directly related to the spread of metastases in

animals with SIAC, associated with a decrease in the expression of proteins of tight contacts.

Research by M. Kruchinina et al. (Novosibirsk) [12] was devoted to the study of the features of the composition of fatty acids of erythrocyte membranes in patients with colorectal cancer (including in the early stages) with different tumor localization. The authors found in such patients a significantly more pronounced decrease in the level of saturated and monounsaturated fatty acids and, conversely, a significantly greater increase in the level of polyunsaturated fatty acids compared with healthy ones. This ratio was significantly less pronounced when comparing these indicators in patients with distal tumor localization and healthy individuals. The indicators of the content of saturated fatty acids (myristic C14:0 and pentadecane C15:0, omega-3 linolenic) were higher in case of the localization of the tumor in the proximal regions, as well as the level of omega-6 polyunsaturated fatty acids (C18:2, C20:3, C20:4) and omega-3 polyunsaturated fatty acid (C22:6) was lower at that localization of the tumor. Differences in the content of fatty acids were also found in case of the localization of the tumor in the proximal and distal parts in the early stages of cancer. The authors concluded that determining the profile of fatty acids in patients with colorectal cancer is important for the localization of the tumor. In addition, the identified differences in the content of fatty acids in the early stages of tumor development can be used to determine new markers of its diagnosis.

Yu. Teterin et al. (Moscow) [13] presented the first experience in Russia of endoscopic intraluminal stenting of pancreatic edema after pancreas transplantation. This method was used in 4 patients in whom the early postoperative period after transplantation of the pancreatoduodenal complex was complicated by the development of pancreatic fluid accumulations, and their percutaneous drainage under ultrasound guidance was ineffective. Through the channel of the endoscope, using a catheter and a conductor string, selective catheterization of the main pancreatic duct of the pancreatic-duodenal graft was performed, followed by its contrast and determination of localization and defect in the duct system. The conductor string was fitted with a plastic pancreatic endoprosthesis. After an average of 23.4 ± 6 days, the drainage tubes were removed, and after 40.2 \pm 5 days, all patients in satisfactory condition were discharged. The pancreatic stents were removed after 6 months \pm 7 days. The obtained results allowed the authors to conclude that endoscopic stenting of the main pancreatic duct of the donor pancreas is for today the most highly effective

and minimally invasive method in the treatment of pancreatic edema after transplantation of the pancreatoduodenal complex.

M. Kruchinina et al. (Novosibirsk) [14] investigated the spectrum of fatty acids of erythrocyte membranes and blood serum in patients with fatty liver disease of alcoholic, non-alcoholic and mixed genesis. The authors showed that in patients with alcoholic fatty liver disease (AFLD) there was a significant decrease in the content of linolenic and arachidonic fatty acids as well as omega-6/omega-3 polyunsaturated fatty acids. In nonalcoholic fatty liver disease (NAFLD), a significant increase in the content of C20:0 and a decrease in the level of C20:3 fatty acids were found compared with their indicators in healthy individuals. Panel consisting of serum fatty acids (C14:0, 15:0, 20:0, 20:4, sum of monounsaturated fatty acids, sum of polyunsaturated fatty acids, sum of omega-6 polyunsaturated fatty acids) and fatty acids of erythrocyte membranes (C18:0, 22:6, saturated/unsaturated fatty acids, saturated/polyunsaturated fatty acids) made it possible to differentiate between AFLD and NAFLD (AUC 0.790, sensitivity 0.73, specificity 0.78). The authors concluded that the identified composition of fatty acids of erythrocyte membranes and serum can be used to establish the genesis of fatty liver disease (alcoholic, non-alcoholic, mixed).

A. Turkina et al. (Moscow) [15] studied changes in the non-oncotic properties of albumin in patients with decompensated liver cirrhosis in comparison with those in healthy individuals of the control group. The properties of albumin were evaluated using electron paramagnetic resonance In this case, characteristics such as the indicator of native conformity of albumin, the effectiveness of albumin binding, transport efficacy and detoxification ability were investigated. These parameters were reduced in 96 % of patients (p < 0.001). At the same time, a weak negative association was found between the studied albumin characteristics and the level of bilirubin, a moderate negative association with INR values and a strong negative relationship with scores on the Child-Pugh scale. However, the level of total albumin was only moderately correlated with scores on this scale. The authors did the conclusion that in the vast majority of patients with decompensated liver cirrhosis changes in the native conformation and properties of albumin are detected, which more accurately correspond to the Child-Pugh scores and may in the future become a marker in assessing the severity of the course of liver cirrhosis.

Yu. Golubeva et al. (Moscow) [16] Ouality of life (OOL) was assessed in 95 patients with nonalcoholic fatty liver disease (NAFLD) compared to that of 37 healthy volunteers. NAFLD was diagnosed based on ultrasound results. SF-36 scale was used to characterize QOL, anxiety and depression were assessed according to the HADS scale, the presence of clinically significant fatigue was determined by the FAS scale. In patients with NAFLD compared with healthy individuals, QOL in relation to the physical component was significantly lower than in healthy persons (p < 0.001), more common occurred increased fatigue (p < p0.045), the frequency of depression was higher (p < 0.014). Decreased OOL was associated with clinically significant fatigue (p < 0.001) and depression (p < 0.001). The authors concluded that a decrease in OOL in patients with NAFLD is associated with increased fatigue and depression, which can prevent an increase in physical activity and the normalization of their lifestyle.

K. Ikonnikova et al. (Moscow) [17] assessed the risk of re-hospitalization and death in 112 patients with alcoholic liver cirrhosis, based on the determination of the direct biomarker of alcohol phosphatidylethanol (PEth), formed as a result of ethanol metabolism, as well as indirect markers of alcohol use — alanine transaminases (ALT), aspartate aminotransferase (AST), gamma-glutamyltransferase (GGT). Depending on the outcome, patients were divided into three groups: with a favorable outcome (74 people), with the need for re-hospitalization (36 people) and death (18 people). The mean PEth level in patients with a lethal outcome and the need for re-hospitalization was higher compared with patients with a favorable outcome (respectively, 468.7 ng/ml, 392.7 ng/ml and 249.8 ng/ml). A similar picture was observed in these groups and in relation to the level of GGT and alkaline phosphatase (ALP). The need for re-hospitalization was significantly correlated with the level of PEth, GGT and ALP. At the same time, the risk of the need for re-hospitalization and death increased with the level of PEth > 340 ng/ml. Based on obtained results, the authors concluded about the effect of use alcohol on the prognosis of patients with alcoholic cirrhosis of the liver.

Giving a general description of the Russian theses published in the materials of the 30. United European Gastroenterological Week, it should be noted the relevance, novelty and high scientific level of research conducted by the authors, which makes it important for practical gastroenterologists to get acquainted with published materials.

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