TRADITIONAL AND EXPERIMENTAL METHODS OF STUDYING AND OVERCOMING THE MEDICAL AND BIOLOGICAL PROBLEMS IN ENSURING THE OPTIMAL VITAL FUNCTIONS OF HUMAN BEINGS AND THE WILDLIFE

Peer-reviewed materials digest (collective monograph) published following the results of the CXLII International Research and Practice Conference and I stage of the Championship in Medicine and Pharmaceutics, Biology, Veterinary Medicine and Agricultural sciences (London, April 13 - April 21, 2017)
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The event was carried out in the framework of a preliminary program of the project “World Championship, continental, national and regional championships on scientific analytics” by International Academy of Science and Higher Education (London, UK)

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Scientific researches review is carried out by means of professional expert assessment of the quality of articles and reports, presented by their authors in the framework of research analytics championships of the GISAP project

Research studies published in the edition are to be indexed in the International scientometric database “Socrates-Impulse” (UK) and the Scientific Electronic Library “eLIBRARY.RU” on a platform of the “Russian Science Citation Index” (RSCI, Russia). Further with the development of the GISAP project, its publications will also be submitted for indexation in other international scientometric databases.


In the digest original texts of scientific works by the participants of the CXLII International Scientific and Practical Conference and the I stage of Research Analytics Championship in Medicine and Pharmaceutics, Biology, Veterinary Medicine and Agriculture are presented.

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On November evening on the eve of St. Martin’s Day 1659 one of the most popular taverns in the central part of Delft, which is located in the South of the Netherlands, halfway between Rotterdam and the Hague, was crowded with citizens joyfully celebrating the upcoming holiday. Pale light of the full moon shone evenly through the weeping windows of the pub and created a bizarre contrast with the trembling light from candles and oil lamps inside the room. Most of the visitors of the tavern were merchants, artisans and fishermen with their wives or girlfriends. Some tables, however, were occupied by petty city officials engaged in easy conversations while drinking juniper vodka and eating cheese and ham.

Suddenly, the tavern door opened wide, letting inside a burst of cold air, which almost blew out the flame of a...
Cheese?! - The blacksmith turned red again. - Do you want to surprise me with cheese?"

No, my friend, I want to show you tiny creatures, which are a thousand times smaller than the eye of an adult louse. And in addition I can surprise with the fact that these tiny creatures fill, for example, your entire mighty louse. And in addition I can surprise with the fact that they are a thousand times smaller than the eye of an adult louse! - Leeuwenhoek pinched off a small crumb of cheese this tavern keeper, crushed it into powder with his fingers and touched one of fingers with a metal plate, brought by the tavern keeper, crushed it into powder with his body! - Leeuwenhoek pinched off a small crumb of cheese these tiny creatures fill, for example, your entire mighty louse. And in addition I can surprise with the fact that they are a thousand times smaller than the eye of an adult louse! - No, my friend, I want to show you tiny creatures, which want to surprise me with cheese?"

Cheese?! - The blacksmith turned red again. - Do you want to surprise me with cheese?"

Half an hour later, the table, where Leuwenhoek was sitting, was surrounded by all visitors of the tavern. People pushed each other away, trying to squeeze themselves closer to the magic microscope.

So do you are saying, dear Antoni, that these moving "sticks" and "hooks" can be found in the drop of my blood that I’d put on the plate? - The dumbfounded blacksmith couldn’t take his eyes from Leuwenhoek and barely resisted his excitement. - But how?! How is this possible?! Here on the table there are the same drops of my blood. Red, no “little creatures” inside! Are you a wizard or a swindler?! You have indeed surprised me and deprived me of calmness! Why did you even come here today? To impress the imagination of people here?

No, my dear Martin, it’s very simple: I haven’t left the house for several days. I’ve been polishing the lenses and building a brand new type of a microscope. And when I finished my work, I found out that I had no food to finish my work, I found out that I had no food to examine different kinds of bacteria through this device... So, I was simply forced to visit this tavern at such a late hour, disturb your peace and conduct a public experiment! - Leuwenhoek looked around and smiled slyly. - But you have no idea, my friends, how many interesting and useful for science things I have discovered in this blood, as well as saliva, semen, surface of the skin, and organisms of animals and insects...

This digest includes reports, presented on the CXLII International Research and Practice Conference “Traditional and experimental methods of studying and overcoming the medical and biological problems in ensuring the optimal vital functions of human beings and the wildlife” and on the 1st stage of research analytics championship of various levels in Medicine and Pharmaceutics, Biology, Veterinary Medicine and Agricultural sciences.

We are sincerely grateful to authors of works presented in the digest for active participation in international scientific communications, we congratulate winners and awardees of relevant research analytical championships and we look forward to further participation of these scientists in the Global International Scientific Analytical Project of the IASHE and to their new ideas and scientific innovations.

Yours sincerely, -
Head of the IASHE International Projects Department
Thomas Morgan

May 8, 2017
London, UK
National Research Analytics Championship
Azerbaijan
Kazakhstan
Moldova
Russia
Ukraine

Open European-Asian Research Analytics Championship
Azerbaijan
Kazakhstan
Russia
Ukraine

International Scientific and Practical Conference
Azerbaijan
Bulgaria
Kazakhstan
Moldova
Russia
Ukraine
EXPERTS OF CHAMPIONSHIPS AND CONFERENCE

ALEXANDER CHIGLINTSEV (RUSSIA)
Doctor of Medicine, Full Professor

Place of work: South Ural State Humanitarian Pedagogical University
Discoveries and inventions: 11 certificates of the Russian Federation of computer programs state registration, 6 patents for inventions of new methods of operations and surgical instruments.
Scope of research interests: practical and theoretical urology, psychology, organization of health care and public health, the legal aspects of medical practice, intellectual property in medicine, patent law.

ALEXANDRA TEGZA (KAZAKHSTAN)
Doctor of Veterinary medicine, Full Professor

Place of work: Kostanai State University A. Baitursynov
Discoveries and inventions: Copyright certificate «Method of producing dry museum preparations of tubular organs»
Scope of research interests: Pathology of the reproductive system of cows; The pathogenesis of foot rot among sheep.

BAKAR SUDHIR (INDIA, USA)
DM, Cardiology Centre (Agra).

DANI SARSEKOVA (KAZAKHSTAN)
Doctor of Agricultural sciences, Associate Professor, Acting Professor

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Discoveries and inventions: patent pending.
Scope of research interests: forest plantations, irrigation forestry.

GABRIEL GRAZBUNGAN (SWITZERLAND)
DSc, co-owner of an international agricultural corporation.

GALINA KHIMICH (KAZAKHSTAN)
Candidate of Biology, Associate Professor.

Place of work: Innovative University of Eurasia, Pavlodar.
Scope of research interests: Problems of adaptation of organism when influenced by different etiological factors, problems of developmental physiology.
GEORGE CRUIKSHANK (UK)
HScD, cal clinic “ Flavor “ (Damask, Syria)

HOKUMA KULIEVA (AZERBAIJAN)
Doctor of Biology, Full Professor

Place of work: Baku State University, Institute of Zoology of the Azerbaijan National Academy of Sciences
Scope of research interests: entomology, ecological physiology.

MAXIM KOSTIN (RUSSIA)
Candidate of Agricultural sciences

Place of work: Russian Academy of Sciences - Institute of Forest Science
Discoveries and inventions: Patent application submitted in 2013, pending.
Scope of research interests: Rational nature management, protective afforestation, restoration of forest plantations.

LASZLO KORPAS (HUNGARY)
East European Cynology Association, PhD

LIUDMILA KOKOLOVA (RUSSIA)
Doctor of Veterinary medicine, Head of the laboratory

Place of work: Yakut Research Institute of Agriculture (Yakutsk).
Discoveries and inventions: FFIP Patent for invention №2532977, 2014
Certificate №2014621492, 2014
Scope of research interests: Veterinary medicine, helminthology, parasitology, microbiology, biotechnology

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THOMAS STEVENS (USA)
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YELENA SHARACHOVA (RUSSIA)
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Place of work: Altai State Medical University.
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YURIY LAKHTIN (UKRAINE)
Candidate of Medicine, Associate Professor
Place of work: Kharkiv Medical Academy of Postgraduate Education
Scope of research interests: dentistry, dental diseases, periodontal tissues, oral mucosa, anesthesiology in dentistry, physiotherapy, dentistry, dental filling materials, the organization of health care, drug treatment in dentistry, pharmacotherapy in dentistry, dental ecogenic
Following the results of the I stage of the Championship in Medicine, Pharmaceutics, Biology, Veterinary Medicine and Agriculture, held within the framework of the National Research Analytics Championship and the Open European-Asian Research Analytics Championship, the Championship Organizing Committee and IASHE regional expert council decided to single out the following reports as the best research works presented at the championships:

OPEN EUROPEAN-ASIAN RESEARCH ANALYTICS CHAMPIONSHIP

Absolute championship

**Agricultural Sciences**
Bronze decoration, Money bonus in the amount of Euro 25 and 50 credits

Maxim Kostin

**Biology**
Bronze decoration, Money bonus in the amount of Euro 25 and 50 credits

Oxana Khluchshevskaya, Galina Khimich

**Pharmaceutics**
Bronze decoration, Money bonus in the amount of Euro 25 and 50 credits

Nataliia Bondarenko, Mykola Blazheyevskiy

**Veterinary**
Bronze decoration, Money bonus in the amount of Euro 25 and 50 credits

Alexandra Tegza

NATIONAL RESEARCH ANALYTICS CHAMPIONSHIP

Absolute championship

**Medicine**

**Ukraine**

Silver decoration, Money bonus in the amount of Euro 30 and 60 credits

Liubov Hryhorenko

Bronze decoration, Money bonus in the amount of Euro 25 and 50 credits

Olena Vasilienko, Olena Viedienieieva, Valentin Drozda

**Pharmaceutics**

**Ukraine**

Bronze decoration, Money bonus in the amount of Euro 25 and 50 credits

Nataliia Bondarenko, Mykola Blazheyevskiy
All the participants of championships except those who were awarded with diplomas receive certificates of participants of the championship.

On behalf of the Organizing Committee and the Commission of Experts
I stage of the Championship in Medicine, Pharmaceutics, Biology, Veterinary Medicine and Agriculture
of the National research analytics championship
and the Open European-Asian research analytics championship

Head of IASHE International Projects Department
Thomas Morgan
The results obtained at the end of the treatment have proved the low capacity of healing of periodontal tissue in patients who have hyperglycemia. This fact can be seen comparing the results of the 1st and the 2nd group.

![Fig. 8. PMA index comparation between 1st and 2nd group after the treatment](image)

1. In first group:
   - In 70% - PMA index after treatment is lower than 30%
   - In 30% - PMA index after treatment is between 31-60%

2. In second group, PMA index is lower than 30% in 100% cases.

   There persists an after-treatment inflammation in patients with DM, which can be easily explained through a certain mechanism, which consists of:

   Advanced glycation end-products (AGE) can convert macrophages in cell with destroyer phenotype, which can produce proinflammatory cytokines – IL1-β, IL-6 and TNF a. AGE increase the number of adhesives receptors which maintain an chronic inflammation, progressive tissue damage and the decreased ability of regeneration. The accentuation of gum inflammation is due to diabetic angiopathy.

   Researchers stated that glycemia increases in patients with CMP having DM, but if it is treated (CMP) then the glycemia normalizes.

   **Conclusions:** Diabetes presents a prevalence and an incidence that continues to grow, the fact that determines the dentist to have in his daily work more patients with this disease.

   Periodontitis in DM are met in about 60%-90%, having an early debut and rapid progression. Patients with diabetes need an individual stomatological treatment, because the decrease of the salivary flow dynamics contributes to the significant growing of the plaque and tartar deposits.

   The decreasing of post-treatment gum inflammation is seen in patients with DM because of the increasing of adhesive receptors which maintain a chronic inflammation, progressive tissue damage and the decreased ability of regeneration.

**References:**
Aspects detected components correlated with the liver parenchyma degree of functional activity disturbances. The authors conclude that homeostasis disorders established in patients with liver cirrhosis complicated by ascites should be taken into account in cases of surgical tactics performing out.

**Keywords:** liver cirrhosis, ascite, proteins, endotoxicosis, pathogenetic treatment, surgical treatment individual tactic

**Introduction.** Treatment of patients with liver cirrhosis (LC) and its complications remains one of the most difficult problems of surgery, including surgical hepatology and biliary surgery. According to WHO, the LC rate is steadily increasing [1, 2]. As to the results of autopsies, it ranges from 1 to 11% [3-5].

Unfavorable high incidence of LC morbidity as described above, due to rising incidence of acute viral hepatitis, especially due to viral hepatitis types B, C and D, results in marked chronic inflammatory and destructive process in the liver parenchyma [6, 7] with the formation of LC and other complications [7, 8].

It should also be noted that the development of inflammatory and destructive lesions of the liver with the formation of LC is brought about by adverse environmental conditions, contact with hepatotropic poisons, alcoholism as well as drug addiction. Viral hepatitides play an important part in increasing the incidence of LC, as it was shown that chronic pathological process in the liver during the first year is 15 - 22.7% in patients with viral hepatitis B and C [2]. In prolongation of the course of viral hepatitis B – for about 3-5 years - the chronic process is observed in 40.9% of patients and in 74.4% of patients with hepatitis C. It is shown that an average 20-30% of these patients develop liver cirrhosis, and about 20% of the disease is transformed into cancer [2, 3, 9].

Therefore, adverse environmental conditions, consistently high level of alcoholism, drug addiction growth, reinforced by economic difficulties, promote the growth of the liver disease as well as in general organs of the gastro-duodeno-hepatobiliary system, as it is the leader in the maintenance and regulation of homeostasis. A severe course of the disease, diagnosis, and - in most cases - failure of treatment makes this disease the most important in modern surgery. It is clear that specific surgical techniques should be used for these patients as well as individual approach, on the basis of which an individual treatment strategy should be devised. Therefore, we made a series of retrospective calculations and traced quantitative content of blood proteins, and a number of other compounds that determine peculiarities of the course of endotoxic reactions in blood and ascetic fluid (AF) in patients with LC in comparative perspective study.

**Objective.** Investigation of proteins and determination of chemical properties characteristic of blood plasma and AF in patients with LC in different stages of its intensity in the comparative perspective study to select individual tactics of further treatment.

**Materials and methods.** 262 patients with LC have been treated aged from 36 to 69 For the last 7 years. There were 164 (62.6%) women and 98 (37.4%) men. The age of 67 patients (25.6%) was over 40, the age of 97 patients (37.0%) was over 50, and the age of 56 patients (21.4%) was over 60.

The diagnosis of LC was made on the basis of clinical examination of patients, blood chemistry, ultrasound of the organs of the hepatopancreatoduodenal area, CT, endoscopic retrograde pancreatocholangiography, etc.

As a result of complex diagnostic examination and subsequent treatment, all patients were retrospectively divided into 4 groups: group 1 - patients with LC in the compensation stage (n=33, 12.6%), the second group - patients with LC in the subcompensation (n=152, 58.0%), 3 group - patients with LC in the uncompensated stage (n=61, 23.3%) and 4 group - patients with LC in the critical terminal stage (n=16, 6.1%). The control group consisted of 19 healthy individuals without liver disease, having a professional medical examination.

Conventional methods determined the content of proteins (albumin, globulins), and total bilirubin, the molecules of medial weight (MMW), residual nitrogen, urea, creatinine, ALT, AST, alkaline phosphatase, cholesterol and lecithin in the blood plasma and AF of patients with LC. The results obtained in patients at the time of admission to the surgical hospital before treatment have been analyzed. The results were treated statistically. Differences were considered statistically significant in p<0.05.

**Results and discussion.** The data are presented in tables. While analyzing quantitative characteristic of blood plasma proteins and AF in patients with LC at different stages of its manifestation, it was clear that the main studied indices did not differ significantly from those we have received in the follow-up studies (Table 1, p>0.05) in patients of 1 group. So, considering the figures the number of proteins and other investigated compounds (Table 2), it is clear that the relative compensation of its function is characteristic of patients with the first stage of the pathological process in the hepatic parenchyma in absence of an active destructive (alternating) process, which is expressed predominantly by maintaining protein-synthesizing function, but there is observed lipid metabolism disorder and moderate chronic intoxication.

The patients with LC at the subcompensation stage are characterized by a moderate activation of the liver with a clear decrease in the protein-synthesizing function, mainly due to albumin - globulin imbalance (Table 1), with development of chronic intoxication. AF of these patients is observed to reduction of protein, and decrease in plasma results in significantly greater loss of its concentration.

Thus, the same components of the body homeostasis are in AF, such as blood plasma (sometimes even in bigger amount), making AF an adequate plasma component replacement in LC and in its progression to liver failure. Having a significant antiatherogenic potential AF should be determined before certain complex of hypolipid therapy in its repeated use.

Hypo- and dysproteinemia were marked in the blood of 16 patients in the terminal stage of the disease. The protein content in AF was also significantly reduced. Clinical symptoms were predominant during the examination of such patients - development of edema of the lower extremities, cachexia, severe cardiovascular and pulmonary insufficiency, presence of transudate in the pleural cavity, etc.

**Surgery**
Summarizing these data, it should indicated that all stages of LC, which are complicated by the presence of ascites, are characterized by the disorder of protein homeostasis, increased content of atherogenic lipoproteins in the blood and consequent changes in the structure of hepatocyte membranes. Key studied indices of AF correlated (r=0.69-0.87) with the degree of functional activity of the liver parenchyma. The above indices of disturbed homeostasis of the corresponding patients should be taken into account in the development of surgical treatment of patients with LC complicated by ascites.

Tab. 1. Quantitative characteristic of blood plasma proteins and ascetic fluid (AF) in patients with liver cirrhosis in different stages of its manifestation

<table>
<thead>
<tr>
<th>Manifestation stage of liver cirrhosis in treated patients</th>
<th>Site of determination</th>
<th>General concentration, g/l</th>
<th>Ratio of albumin / globulin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>General protein</td>
<td>Albumins</td>
</tr>
<tr>
<td>Control indices (blood plasma), n=19</td>
<td>Control indices (blood plasma), n=19</td>
<td>77.7±7.3</td>
<td>48.2±5.6</td>
</tr>
<tr>
<td>I stage, n=33</td>
<td>Blood plasma</td>
<td>62.9±6.9</td>
<td>34.9±4.1</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td>44.6±4.5</td>
<td>33.8±3.6</td>
</tr>
<tr>
<td>II stage, n=152</td>
<td>Blood plasma</td>
<td>57.1±4.9</td>
<td>28.9±3.2</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td>31.1±2.9</td>
<td>21.9±2.4</td>
</tr>
<tr>
<td>III stage, n=61</td>
<td>Blood plasma</td>
<td>54.7±5.0</td>
<td>20.4±2.4</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td>19.7±2.3</td>
<td>-</td>
</tr>
<tr>
<td>IV stage, n=16</td>
<td>Blood plasma</td>
<td>43.7±4.4</td>
<td>18.3±2.1</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td>3.1±0.4</td>
<td>-</td>
</tr>
</tbody>
</table>

Tab. 2. Comparative characteristic of chemical properties of blood plasma and ascetic fluid (AF) in patients with liver cirrhosis in different stages of its manifestation

<table>
<thead>
<tr>
<th>Manifestation stage of liver cirrhosis in treated patients</th>
<th>Site of determination</th>
<th>Total bilirubin, MCM, mmol/l</th>
<th>Residual nitrogen, mmol/l</th>
<th>Urea, mmol/l</th>
<th>Creatinine, mmol/l</th>
<th>ALT, mcml/l</th>
<th>AST, mcml/l</th>
<th>Alkaline phosphatase, U/l</th>
<th>Cholesterol, mmol /l</th>
<th>Lecithin, mmol/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control indices (blood plasma), n=19</td>
<td>Control indices (blood plasma), n=19</td>
<td>15.6±3.3</td>
<td>208±20</td>
<td>16.5±1.8</td>
<td>5.1±0.6</td>
<td>0.08±0.01</td>
<td>0.56±0.04</td>
<td>0.34±0.03</td>
<td>44.7±4.1</td>
<td>5.1±0.5</td>
</tr>
<tr>
<td>I stage, n=152</td>
<td>Blood plasma</td>
<td>18.6±2.2</td>
<td>245±25</td>
<td>18.1±1.9</td>
<td>5.1±0.5</td>
<td>0.06±0.01</td>
<td>0.26±0.02</td>
<td>0.30±0.02</td>
<td>62.1±5.7</td>
<td>4.4±0.3</td>
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<td></td>
<td>AF</td>
<td>5.9±0.6</td>
<td>90±8</td>
<td>6.7±0.7</td>
<td>2.1±0.2</td>
<td>-</td>
<td>0.19±0.02</td>
<td>0.16±0.02</td>
<td>-</td>
<td>3.0±0.3</td>
</tr>
<tr>
<td>II stage, n=152</td>
<td>Blood plasma</td>
<td>33.7±3.4</td>
<td>309±29</td>
<td>26.4±2.3</td>
<td>5.5±0.5</td>
<td>0.08±0.01</td>
<td>0.62±0.05</td>
<td>0.91±0.08</td>
<td>69.8±7.1</td>
<td>3.7±0.4</td>
</tr>
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<td></td>
<td>AF</td>
<td>18.1±2.1</td>
<td>210±19</td>
<td>21.2±2.0</td>
<td>3.0±0.3</td>
<td>-</td>
<td>0.24±0.02</td>
<td>0.21±0.02</td>
<td>-</td>
<td>2.4±0.3</td>
</tr>
<tr>
<td>III stage, n=61</td>
<td>Blood plasma</td>
<td>89.4±8.8</td>
<td>600±56</td>
<td>36.7±3.2</td>
<td>9.1±0.8</td>
<td>1.00±0.01</td>
<td>0.56±0.06</td>
<td>0.54±0.05</td>
<td>104.4±9.3</td>
<td>7.6±0.7</td>
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<td>38.4±4.1</td>
<td>390±40</td>
<td>26.4±2.9</td>
<td>5.9±0.5</td>
<td>-</td>
<td>0.45±0.04</td>
<td>0.31±0.03</td>
<td>-</td>
<td>3.6±0.3</td>
</tr>
<tr>
<td>IV stage, n=16</td>
<td>Blood plasma</td>
<td>15.1±1.3</td>
<td>-</td>
<td>21.4±2.2</td>
<td>7.3±0.7</td>
<td>0.07±0.01</td>
<td>0.23±0.02</td>
<td>0.37±0.04</td>
<td>109±9.7</td>
<td>3.1±0.3</td>
</tr>
<tr>
<td></td>
<td>AF</td>
<td>9.1±0.8</td>
<td>-</td>
<td>17.8±1.8</td>
<td>4.6±0.4</td>
<td>0.21±0.02</td>
<td>0.16±0.02</td>
<td>-</td>
<td>3.0±0.3</td>
<td>0.6±0.1</td>
</tr>
</tbody>
</table>

References:
6. Abdukadurova M.A. Hepatitis C virus - one of the main ecologic factors of chronic hepatitis., Chronic diseases of the liver from hepatitis to liver cirrhosis – Tashkent., 1996., pp. 4-5.