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## CONTENTS

## CHEMISTRY

- Байкулов А. К., Бегматова Д. А., Зияева С. Ф., Саидмурадова З. А., Ишмуратова А. С., Тураева К. Ф., Хайдарова Д. М., Бутаев О. И., Рахматов М. М., Омонов О. З., Джалолов Д. А.*  
ПОКАЗАТЕЛИ СИСТЕМЫ ОКСИДА АЗОТА  
ПРИ ЭКСПЕРИМЕНТАЛЬНОЙ ГИПЕРХОЛСТЕРИНЕМИИ..... 5

## MEDICINE

- Horot I. V., Tkachenko M. M., Remennik O. I.*  
INTERSTITIAL HDR BRACHYTHERAPY AT NON-MELANOMA SKIN CANCER..... 9
- Kryvoruchko I. A., Teslenko S. N., Goncharova N. M., Drozdova A. G., Sviripo P. V., Suplichenko M. V., Gontar V. F.*  
REMOTE RESULTS OF SURGICAL TREATMENT  
OF ACUTE DESTRUCTIVE PANCREATITIS..... 13
- Syvolap V. V., Zhemanyuk S. P., Lukashenko L. V.*  
AMBULATORY BLOOD PRESSURE MONITORING IN IN-TREATED HYPERTENSIVES:  
WHAT ARE THE TARGET PARAMETERS..... 17
- Дубовская С. С., Битчук М. Д., Ковальковский Е. В.*  
СОСТОЯНИЕ ПОСЛЕОПЕРАЦИОННОЙ КОГНИТИВНОЙ ДИСФУНКЦИИ..... 20
- Ткаченко А. И., Шаповалова Е. И., Ромак Р. П., Евсиков Б. В.*  
ДИФФЕРЕНЦИРОВАННЫЙ ПОДХОД В ВЫБОРЕ  
МЕТОДА ГЕПАТОБИЛИАРНОЙ ДЕКОМПРЕССИИ..... 23
- Халиков К. М., Байкулов А. К., Бегматова Д. А., Саидмурадова З. А., Ишмуратова А. С., Ким О. В., Муртазаева Н. К., Файзуллаева Х. Б., Халимова С. А., Зияева С. Ф.*  
ИЗУЧЕНИЕ РЕЗУЛЬТАТОВ ЛЕЧЕНИЯ КРЫС  
С ОЖГОВОЙ ТРАВМОЙ ПРОИЗВОДНЫМИ ХИТОЗАНА..... 26
- Desyateruk Volodymyr Ivanovych, Krykun Maryna Sergiivna*  
DIAGNOSIS OF LOCAL COMPLICATIONS OF ACUTE PANCREATITIS AT THE  
STAGES OF ITS TREATMENT V. I. DESYATERYK, M. S. KRYKUN..... 29
- Саиджалилова Д. Д., Абдиева М. О.*  
СОСТОЯНИЕ МИНЕРАЛЬНОЙ ПЛОТНОСТИ КОСТИ У ЖЕНЩИН ПОСЛЕ  
ФАРМАКОЛОГИЧЕСКИ ОБУСЛОВЛЕННОГО ДЕФИЦИТА ЭСТРОГЕНОВ..... 32
- Marzia Abdieva, Dilnoza Saidjalilova, Saodat Asilova*  
CALCIUM INTAKE AND RISK OF FRACTURE DURING  
THE PREMENOPAUSE PERIODS..... 34

## VETERINARY SCIENCE AND PHARMACY

- Shumova G. S., Savelieva E. V., Vladymyrova I. N., Tishakova T. S.*  
PHENOLIC COMPOUND COMPOSITION OF HERB  
OF PULSATILLA PRATENSIS (L.) MILL..... 35

## TOURISM AND RECREATION

- Obozna A. O., Shabelnik N. M.*  
INNOVATIVE ASPECTS IN TOURISM: REGIONAL ASPECTS..... 39
- Арсененко І. А., Донченко Л. М., Донець І. А.*  
ПРИРОДНІ ТУРИСТИЧНІ РЕСУРСИ ЯК ВАЖЛИВИЙ ЧИННИК РОЗВИТКУ  
ТУРИЗМУ В ЗАПОРІЗЬКОМУ РЕГІОНІ..... 41

**Смолярчук Мирослава Василівна**

РОЛЬ МЕТОДІВ ЕКОНОМІКО-МАТЕМАТИЧНОГО ПРОГРАМУВАННЯ  
ПРИ ПЛАНУВАННІ ТУРИСТИЧНО-РЕКРЕАЦІЙНИХ КОМПЛЕКСІВ..... 51

**Ткаченко Т. І.**

E-TOURISM, ЯК ПРОЯВ ДОМІНУЮЧОГО КРИТЕРІЮ СУЧАСНОГО ТУРОПЕРЕЙТИНГУ:  
АКТУАЛЬНІ ПОЛОЖЕННЯ, ІНСТРУМЕНТИ, ВИКОРИСТАННЯ..... 55

**Алиева С. А., Ян Д. Г., Мазбаев О. Б.**

ПЕРСПЕКТИВЫ ПРОЕКТА «НОВЫЙ ШЕЛКОВЫЙ ПУТЬ»  
ДЛЯ РАЗВИТИЯ ТУРИЗМА В КАЗАХСТАНЕ..... 59

#### **ECOLOGY**

**Бакунова О. М., Образцова О. Н., Бакунов А. М., Калитеня И. Л.**

ОЦЕНКА АНТРОПОГЕННОЙ НАГРУЗКИ НА  
АДМИНИСТРАТИВНЫЕ ТЕРРИТОРИИ РЕСПУБЛИКИ БЕЛАРУСЬ..... 63



# DIAGNOSIS OF LOCAL COMPLICATIONS OF ACUTE PANCREATITIS AT THE STAGES OF ITS TREATMENT

## V. I. DESYATERYK, M. S. KRYKUN

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**Abstract.** *The aim. To study the diagnostic value of individual clinical and laboratory manifestations associated with the development of intra- and peripancreatic collections according to the Atlanta 2012 Classification Review for the timely addition or modification of the tactics.*

*Materials and methods. 72 patients were examined. In accordance with the tasks, the patients were divided into 3 groups. The first (main) group of the study consisted of 30 (41.67 %) patients who used CT for indications and the classification of acute pancreatitis was used according to the View. The comparison group consisted of 32 patients (44.44 %) who were treated in 2011 and 2013, they used the Atlanta 1992 Classification. The control group consisted of 10 patients (13.89 %) who were hospitalized for scheduled surgical intervention in a satisfactory condition. The examination was performed three times: during hospitalization (first study), 1 week (second study) and 2 weeks after hospitalization or discharge (third study).*

*Results and discussion. The most characteristic clinical symptom is abdominal pain, which in 100 % of cases is accompanied by necrotic pancreatitis, and 70 % - oedematosis. The main laboratory symptom was lymphopenia, which occurred in 70 % of cases (78.95 % and 54.55 % for necrotic and oedematosis pancreatitis, respectively). Nausea was observed at a frequency of 70.0 %, with a significantly higher incidence ( $p = 0.042$ ) in patients with necrotic pancreatitis (84.21 %) than in the subgroup with oedematosis form disease (45.45 %). Among the local complications are dominated by encapsulated forms. Lymphocyte level was determined, which helps to predict the development of local complications, their infection and the need for surgical intervention.*

*Conclusion. The most characteristic clinical symptom is abdominal pain, which in 100 % of cases is accompanied by necrotic pancreatitis, and 70 % - oedematosis. The main laboratory symptom was lymphopenia, which occurred in 70 % of cases (78.95 % and 54.55 % for necrotic and oedematosis pancreatitis, respectively). Among the local complications are dominated by encapsulated forms. Lymphocyte level was determined, which helps to predict the development of local complications, their infection and the need for surgical intervention.*

**Keywords:** *acute pancreatitis, local complications.*

**Introduction.** There is no doubt that acute pancreatitis is an urgent and complicated problem of abdominal surgery. Thus, due attention and deepening of knowledge of surgeons, physicians, radiologists, endocrinologists and doctors of other specialties in 2012 were the result of the revision of the Atlanta classification of 1992 [4]. According to the new classification, depending on the appearance and form of acute pancreatitis, the following local complications were identified: acute peripancreatic fluid collections (APFC) and pancreatic pseudocysts (PP) in oedema form 4 weeks before and after the onset of the disease; in the necrotic form - acute necrotic collections (ANC) and walled-off necrosis (WON), also according to 4 and after 4 weeks of the disease. All forms may be aseptic and infected. The literature describes the actuality of surgical tactics, the effectiveness and necessity of minimization interventions, efficiency of using ultrasound and CT for controlled drainage of foci is confirmed [2, 1, 3]. On the other hand, in order to proceed with the choice of surgical tactics, it is necessary to evaluate in a timely and effective manner the physical and laboratory data obtained during the clinical examination of the patient. Also, in the literature there is information about the increase in the number of patients with infected forms of necrotic pancreatitis, therefore, it is very important to diagnose or predict septic complications in a timely manner. [3, 5]

**The aim.** To investigate the diagnostic value of some clinical and laboratory manifestations under conditions of the development of local complications of acute pancreatitis according to the Atlanta 2012 for the timely addition or change of therapeutic tactics.

**Materials and methods.** In the conditions of the city specialized department for the treatment of acute pancreatitis "City Clinical Hospital №8" and the "City Clinical Hospital № 2", which are the clinical bases of the Department of Surgery, Traumatology and Orthopedics of the Department of Postgraduate Education, the "Dnipropetrovsk Medical Academy", 72 patients were examined. In accordance with the tasks, the patients were divided into 3 groups. The first (main) study group consisted of 30 (41.67 %) patients who were screened and treated from 2014 to 2016, who used CT for evidence and used the classification of acute pancreatitis according to the View.

The comparison group consisted of 32 patients (44.44 %) who were treated in 2011 and 2013, they used the Atlanta 1992 classification.

The control group consisted of 10 patients (13.89 %) who were hospitalized for scheduled surgical intervention in a satisfactory condition.

Analysis of the distribution of patients in the study group according to the sex-and-sexual characteristics showed that in both groups, men predominate: 63.33 % and 75 % respectively in the main group and in the comparison group ( $p = 0.608$ ).

The average age in the main group was  $46.13 \pm 2.17$  (M  $\pm$  m) years, in the comparison group -  $45.47 \pm 2.92$  years, in the control group -  $43.9 \pm 4.24$  years ( $p > 0, 05$  with all comparisons). Age structure in the studied groups was similar, dominated by age groups up to 60 years ( $p = 0.226$ ).

The analysis for homogeneity of the main group, the comparison group and the control group showed that in the distribution of patients in groups, depending on age and sex, no significant differences were detected ( $p > 0.05$ ), which indicates their correction of comparability and the possibility of comparison to identify discrepancies in other parameters

Depending on the type of disease, the distribution of patients with AP was as follows: in the main group, the majority of patients were patients with necrotic pancreatitis (19 patients - 63.33 %), the rest with oedema (13 patients - 40.63 %); In the comparison group, the majority included patients with oedema (59.37 %), with a smaller proportion with necrotic (11 patients - 36.67 %). However, statistically significant differences between the groups according to the type of disease were not detected ( $p = 0.074$ ), which confirms the possibility of a correct comparison of groups.

The main group and the comparison group did not differ significantly ( $p = 0,845$ ) according to the terms of hospitalization of patients from the onset of the disease.

The vast majority of patients (83.33 % in the main group and 78.13 % in the comparator group) enter the hospital with a disease duration of more than 24 hours, units - the first 8 hours, from the onset of the disease, and less than a quarter - within a time interval of 8 to 24 hours

The proportion of patients who were conservatively and promptly treated was shifted toward providing surgical care in both groups ( $p = 0.631$ ): 53.33 % of the patients in the main group and 59.38 % of the controls were operated.

The nature of surgical interventions performed by patients in both groups has no statistically significant differences ( $p > 0.05$ ). In general, the frequency of surgical interventions in the main study group was 70.0 %, in the comparison group - 84.38 %. The examination was performed three times: during hospitalization (first study), 1 week (second study) and 2 weeks after hospitalization or discharge (third study).

**Results and discussion.** Often, in the examined patients, a clinical symptom was observed such as pain with a frequency of 93.33 % among all subjects, more often (with no significant differences  $p > 0.05$ ) in patients with necrotic AP - 100.0 %, than in patients with oedematosis form - 81, 82 %.

With a frequency of 70.0 %, nausea was observed, with a significantly higher incidence ( $p = 0.042$ ) in patients with necrotic pancreatitis (84.21 %) than in the subgroup with oedema mold disease (45.45 % (95 %)). The same frequency in the total number of subjects was observed in limphopenia - in 70.0 % of cases, and also predominantly in a subgroup with a necrotic form of the disease (78.95 %) versus 54.55 % in the subgroup of comparison, but without significant differences ( $p > 0.05$ ) In half of the cases, without significant differences between subgroups ( $p > 0,05$ ), in the case of acute pancreatitis was creatinine increase 50.0 %

In almost half of the subjects (43,33 %), leukocytosis was found predominantly with a necrotic AP of 57,89, whereas in the case of oedematosis form of the disease, this symptom is less common ( $p > 0,05$ ) - in 18,18 % of cases. The increase in amylase was accompanied by a disease in 26.67 % of cases, more often ( $p > 0.05$ ), but statistically insignificant, was observed in the subgroup of necrotic AP (31.58 %) compared with edema (18.18 %). Body temperature 38 ° C and above was observed infrequently, in general - in 16.67 % of the cases, while more often (statistically insignificant  $p > 0.05$ ) was determined in patients with a necrotic form of the disease (21.05 %) than with edema (9,09 %). Consequently, the frequency of both clinical and laboratory symptoms in a destructive GP is greater in

comparison with the edema form of the disease, but statistically significant discrepancies are detected only by the symptom of nausea.

Among the forms of local complications of AP the largest share belongs to WON (38,89 %), more than one quarter percent (by 27,78 %) occupy ANC and infected WON. Consequently, encapsulated forms that occur after 4 weeks of disease predominate.

Also, in half of the cases of severe disease, infection of the intrapancreatic and peri-pancreatic collections occurs, while in the average degree of severity only 1 (7.14 %) of the patient ( $p = 0.017$ ). In the subgroups of observation, the incidence of intra- and peripancreatic collections is significantly different ( $p < 0,05$ ), since in the form of edema it does not differ from the necrotic one, which is observed in half of the cases.

At admission in the main group of research, the level of leukocytes, strain-cells neutrophils, lymphocytes, ESR, LII, blood amylase was statistically significantly different from the control ( $p < 0,05$ ); in the comparison group - the level of leukocytes, rodenuclear and segmental neutrophils, eosinophils, lymphocytes, LII, general, direct and indirect bilirubin, blood amylase and prothrombin index.

After treatment, the differences between the main group and the comparison group, as well as their differences from control, are reduced. There are discrepancies between the observation groups only with ESR, eosinophils, LII and AIT. The leukocyte index of intoxication, which is significantly lower ( $p = 0.017$ ) in the main group (Me (25 %; 75 %), is 1.37 (0.64; 2.58) compared to the comparison group - 2.64 (1.59; 74.5).

The threshold prognostic value of lymphocytes for prediction was determined by the optimal cut-off point of the ROC curve. The optimum clipping point can be used as a critical level for making a clinical decision.

For the prediction of intra- and peripancreatic collections in patients with AP, the critical value of the level of lymphocytes at the optimal cut-off point is  $\leq 16$  %, for the infection of the intranasal and peri-penetrating fluid accumulations  $\leq 15$  % (Fig. 3), for surgical interventions  $\leq 15$  %

Later, the odds ratio (HS) was calculated from a 95 % confidence interval (95 % CI) as an estimate of the probability of the onset of the event being investigated. Higher than 1 indicates an increased risk. The greater the ratio of chances, the stronger the impact of the indicator on the development of the violation.

At level of lymphocytes  $\leq 15$  % the ratio of chances of development of intra- and peripancreatic fluid collections in patients with AP is HS = 9.6 ( $p = 0.009$ ); Infection of intra- and peripancreatic fluid collections- HS = 45,0 ( $p = 0,011$ ); the need for surgical interventions - HS = 16.47 ( $p = 0.001$ ).

### Conclusions.

1. The most common and most reliable clinical characteristic of AP is characteristic abdominal pain.
2. Although amylase of blood for today is not a diagnostic criterion of acute pancreatitis, this analysis allows to dynamically evaluate the effectiveness of therapeutic tactics.
3. Among the many laboratory indicators, the most informative was the level of lymphocytes, through which one can predict the development of clumps in necrotic pancreatitis, their infection and the need for surgical intervention.

The authors declare that they have no conflicts of interest.

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