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Peculiarities of the use of enteral nutrition in patients with severe acute pancreatitis

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In the general structure of the disease, severe acute pancreatitis occurs in 20 % of cases, requires treatment in the intensive care unit, and is accompanied by a high risk of complications (up to 50 %) and death (40—70 %). In turn, early use of enteral nutrition in patients with severe acute pancreatitis significantly improves the condition of the intestinal wall and the course of the disease as a whole, reducing the number of complications and mortality.

Objective — to determine the timeframe for the restoration of intestinal absorptive function as one of the main criteria for the start of enteral nutrition in patients with severe acute pancreatitis and to improve the results of comprehensive treatment of patients by preventing its complications.

Materials and methods. The results of the evaluation and treatment of 67 patients with severe acute pancreatitis served as the basis for the study. Patients were divided into two groups depending on the specifics of the selected treatment strategies: a comparison group of 33 patients receiving standard enteral nutrition and a main group of 34 patients receiving standard enteral nutrition with the inclusion of antiflatulants in the mixture. Before the start of tube feeding, a test using unmetabolized disaccharides (lactulose/mannitol) and a sample containing a 3 % potassium iodide solution was conducted to determine the timeframe for the restoration of intestinal absorptive function.

Results. In 70.6 % of patients in the main group and 69.7 % of patients in the comparison group, the restoration of intestinal absorptive function was registered only after 48 hours from the beginning of treatment. After 7 and 14 days of enteral nutrition, a significant difference was obtained between total protein, albumin, cholesterol and serum K^+ ($p < 0.05$). After 7 days of treatment, there was a significantly lower incidence of intestinal complications in patients of the main group by 21.5 % ($\chi^2 = 4.88$, 95 % CI 2.3—39.5, $p = 0.03$).

Conclusions. The method, which uses a 3 % potassium iodide solution, is quick and informative for determining the restoration of intestinal absorptive function in patients with severe acute pancreatitis. The inclusion of antiflatulants in the composition for enteral nutrition improved the laboratory parameters of blood serum and reduced the incidence of intestinal complications by 7 days and the duration of multiorgan failure from 11.5 ± 1.8 days to 10.5 ± 1.9 days ($p = 0.04$).

Keywords
acute pancreatitis, intestinal absorption, enteral nutrition, intestinal complications.

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Acute pancreatitis is a common disease that accounts for 5—10 % of urgent pathology of the abdominal cavity and ranks third (25 %) place, yielding to the incidence of acute cholecystitis (28 %) and acute appendicitis (26 %) [1]. In the general structure of the disease, severe acute pancreatitis (SAP) occurs in 20 % of cases, requires treatment in the intensive care unit, and is accompanied by a high risk of complications (up to 50 %) and death (40—70 %) [2]. Recent studies on the pathogenesis of SAP have focused on intestinal barrier disorders, which play an important role in the development of infectious complications during the course of the disease and exacerbate dysfunction of organs and systems [3]. According to the literature, even in the early period of SAP, there are changes in microcirculation and damage to the intestinal endothelium, leading to an increase in toxic products, mediators of inflammation and translocation of intestinal microflora into the bloodstream and surrounding tissues [4]. In turn, early use of enteral nutrition (EN) in patients with SAP significantly improves the

condition of the intestinal wall and the course of the disease as a whole, reducing the number of complications and mortality.

It should be noted that the effectiveness and safety of EN in patients with SAP depend on a number of factors, including the type of mixture used, the timeframe for the restoration of peristalsis and absorptive function of the intestinal wall, the method of introducing the mixture, and others. Thus, there are many studies that suggest that EN should be started as early as possible (24—48 hours after hospitalization) as compared to parenteral nutrition [6]. However, it is also known that early use of EN in patients with SAP can cause digestive and dynamic types of increased flatulence in the gastrointestinal tract, and compliance with these recommendations is dangerous for the development of intestinal complications in the form of large residual volumes — 39 %, diarrhea — 14.7 %, bloating — 13.2 %, vomiting — 12.2 %, and regurgitation — 5.5 % [7].

This is due to the fact that the EN is a violation of the balance between bacteria involved in the production of gases and their absorption, which explains the signs of flatulence in this category of patients. In turn, the combination of syndromes of maldigestion and malabsorption and reflex suppression of intestinal motility on the background of SAP leads to disorders of transport and absorption of nutrients.

It should be noted that guidelines for the care of patients with digestive disorders arising from the use of EN in the treatment of SAP as well as their prevention are insufficiently developed. Thus, according to the literature, enterosorbents, antidiarrheal drugs, and others are used to reduce gas formation in the intestine [8]. However, the therapeutic effect of these drugs is insignificant, so this issue needs further study.

Objective — to determine the timeframe for the restoration of intestinal absorptive function as one of the main criteria for the start of EN in patients with SAP and to improve the results of comprehensive treatment of patients by preventing its complications.

Materials and methods

The study was based on the results of the examination and treatment of 67 patients with SAP who were hospitalized in the clinic of the Department of Surgery No2 of Bogomolets National Medical University, and was approved by the Ethics Committee of Bogomolets National Medical University (15 December 2011, protocol #5). All patients were examined in the period from 2012 to 2021 and signed informed consent to participate in the study and /or treatment in the clinic. The diagnosis of SAP was established in the presence of two of the following three criteria: clinical (upper abdominal pain); laboratory (serum amylase or lipase level 3 times higher than the maximum normal value); and visualization (CT, MRI, or Ultrasound) criteria.

The study included patients with severe disease (the course of the disease was complicated by the presence of multiple organ failure lasting more than 48 hours) according to the acute pancreatitis classification proposed by the Acute Pancreatitis Classification Working Group (2012), who received EN. The APACHE II scale (severe course — 8 points or more) was used to predict the course of acute pancreatitis. The exclusion criteria were chronic somatic diseases in the decompensation phase and the patient's refusal to participate in the study.

Depending on the specifics of the selected treatment strategies, patients were divided into two groups: the comparison group (standard EN) — 33 patients, and the main group (standard EN+antiflatulants) — 34 patients. Semi-elemental and elemental mixtures were used for EN. Feeding was carried out during the day. A drip was given at a rate of 25 ml per hour using a dispenser. Before using EN, patients in the main group received additional injections of simethicone emulsion at a dose of 2 mL (80 mg) 3—5 times a day in order to prevent the development of diarrhea and flatulence.

Patients in the two groups did not differ significantly in age (50.8 ± 9.1 and 52.0 ± 9.5 years, $p > 0.05$, respectively), gender (men 57.6 % and 55.9 %, women 42.4 % and 44.1 %, $p > 0.05$, respectively) and the etiology of the disease (alcoholic 57.6 % and 55.9 %, biliary 30.3 % and 32.6 %, idiopathic 12.1 % and 11.8 %, %, $p > 0.05$, respectively). There was also no significant difference between the indicators (sum of points on the APACHE II scale) of disease severity of the comparison group and the main group at the time of hospitalization (12.9 ± 2.7 and 13.5 ± 3.1; $p > 0.05$, respectively).

Comprehensive conservative treatment of patients was performed in the intensive care unit in accordance with international treatment protocols. Surgical interventions, including minimally invasive ones, under general and local anesthesia were performed in 26 (78.9 %) patients in the comparison group and in 25 (73.5 %) patients in the main group.

A test using unmetabolized disaccharides (lactulose/mannitol) was performed before the start of EN to determine the timeframe for the restoration of intestinal absorptive function. Disaccharides were administered at the beginning of treatment after 12, 24, 36, and 48 hours [9]. In the feeding tube, 5.0 g of mannitol and 5.0 g of lactulose were dissolved in 100

ml of distilled water. Urine was collected within 6 hours after solution administration and analyzed by ion chromatography using a pulsed amperometric detector 945 Professional Detector Vario-Amperometry, Metrohm, Switzerland (the normal lactulose/mannitol ratio in urine is less than 0.03) [10].

As an alternative method for determining the onset of intestinal absorption, we used our own method, which included a 3 % potassium iodide solution (the sensitivity of the method is 87.36 %, while specificity is 81.5 %) [11]. The timeframe for the restoration of intestinal absorptive function was determined by monitoring the excretion of potassium iodide with saliva 10 minutes after its enteral probe administration (20 mL of a 3 % solution). The transparent secretion was taken in a test tube. In case of restoration of intestinal absorptive function, the color changed to blue upon addition of starch (2 mL of a 10 % of solution).

To analyze the effectiveness of EN in the study groups after 7 and 14 days after treatment, the levels of the following laboratory parameters were assessed: total protein, albumin, total bilirubin, creatinine, urea, fibrinogen, glucose, cholesterol, C-reactivae protein, Na^+ and K^+ serum. We also analyzed the incidence of intestinal complications (occurrence or intensification of epigastric pain, projection of the small and/or colon, vomiting, regurgitation, diarrhea) in the first 24 hours and 7 days after EN, and the occurrence of local complications during the disease, mortality, duration of multiple organ failure, and hospital stay of patients in the main group and the comparison group.

Statistical analysis. The normality of data distribution was determined by the Shapiro-Wilk test. The difference between the groups was established using the Student's t-test for independent samples in the case of parametric data distribution. Differences in sample distribution were assessed using the χ^2 test criterion. The results are presented as means and their standard deviation ($M \pm SD$). Differences between indicators were considered significant at $p < 0.05$.

Statistical analysis was performed using Statistica 10 (Serial Number: STA999K347150-W) and Medcalc® (open access Internet resource, https://www.medcalc.org/calc/).

Results and discussion

When comparing the mean levels of lactulose/mannitol in the urine and their standard deviation in the main group and the comparison group at the beginning of treatment (0.042 ± 0.001 and 0.041 ± 0.001; $p = 0.64$ respectively), after 12 hours (0.040 ± 0.002 and 0.041 ± 0.002; $p = 0.27$ respectively), 24 hours (0.039 ± 0.002 and 0.039 ± 0.003; $p = 0.92$ respectively), 36 hours (0.036 ± 0.003 and 0.037 ± 0.004; $p = 0.9$ respectively), 48 hours (0.033 ± 0.004 and 0.033 ± 0.004; $p = 0.9$ respectively), no significant difference was obtained.

Table 1. **The timeframe for the restoration of intestinal absorptive function in patients with severe acute pancreatitis depending on the duration of treatment in the hospital**

Duration of treatment, hours	Main group (n = 34)	Comparison group (n = 33)
24	3 (8.8 %)	4 (12.1 %)
36	10 (29.4 %)	9 (27.3 %)
48	24 (70.6 %)	23 (69.7 %)

The analysis of the timeframe for the restoration of intestinal absorptive function in patients with SAP depending on the duration of treatment was carried out (Table 1).

The vast majority of patients (70.6 % of patients in the main group and 69.7 % of patients in the comparison group), the restoration of intestinal absorptive function was registered only after 48 hours from the beginning of treatment (see Table 1). The specified time of the restoration of intestinal absorptive function was also confirmed when using a sample containing a 3 % potassium iodide solution.

The analysis and comparison of laboratory indicators of EN efficiency in patients of the main group and the comparison group were also performed. The evaluation of these indicators was performed before the start of the use of EN (Table 2), after 7 days (Table 3) and after 14 days from the beginning (Table 4).

According to the results of the analysis, 7 and 14 days after the use of EN, a significant difference was obtained between the total protein, albumin, cholesterol and K^+ serum ($p < 0,05$). The level of cholesterol, K^+ and Na^+ corresponded to the norm in both groups. It should be noted that the analysis of indicators after 14 days of EN also showed a significant difference between total bilirubin, creatinine, urea, and serum glucose ($p < 0.05$). The levels of glucose and creatinine in the main group were normal.

Analyzing the clinical symptoms associated with the use of EN, the following data were obtained: on the first day after the use of EN in the main group, complications occurred in 14 (41.2 %) patients (increased pain in 5 (14.7 %), vomiting — 4 (11.8 %), diarrhea — 4 (11.8 %), and regurgitation — one (2.9 %) patient) and in the comparison group, in 17 (51.5 %) patients (increased pain in 6 (18.8 %),

Table 2. **Baseline laboratory parameters of patients with severe acute pancreatitis**

Index	Rate	Main group (n = 34)	Comparison group (n = 33)
Total serum protein, g/L	65—85	47.4 ± 2.5 [43—50]	47.8 ± 1.9 [43—54]
Serum albumin, g/L	35—50	27.4 ± 1.1 [26—29]	27.6 ± 1.1 [25—30]
Total bilirubin, μmol/L	3.4—20.8	38.5 ± 13.1 [26.0 ± 61.2]	38.2 ± 13.8 [25.2 ± 68.9]
Creatinine, μmol/L	62—115	152.3 ± 13.0 [129.1—176.1]	151.3 ± 12.7 [121—176.2]
Urea, mmol/L	2.5—8.3	10.1 ± 0.9 [8.6—12.1]	10.1 ± 1.3 [8.9—12.1]
Glucose, mmol/L	3.5—5.5	8.2 ± 2.1 [5.5—12.6]	8.1 ± 1.9 [5.1—12.1]
C-reactive protein, mg/L	0.8—8.0	69.2 ± 20.6 [24—110]	69.8 ± 26.5 [28—120]
Serum cholesterol, mmol/L	2.9—5.17	5.0 ± 0.6 [4.0—6.1]	5.0 ± 0.6 [4.0—6.3]
Na^+ serum, mmol/L	130—149	136.9 ± 7.5 [128—150]	136.7 ± 7.5 [128—152]
K+ serum, mmol/L	3.5—5.4	3.4 ± 0.1 [3.1—3.6]	3.4 ± 0.2 [3.1—3.7]

The difference for all indexes between main and comparison group is statistically insignificant ($p > 0.05$).

Table 3. **Dynamics of laboratory parameters of patients with severe acute pancreatitis after 7 days of enteral nutrition**

Index	Rate	Main group (n = 34)	Comparison group (n = 33)
Total serum protein, g/L	65—85	52.9 ± 1.6 [50—56]	51.7 ± 2.5 [47—57]*
Serum albumin, g/L	35—50	29.8 ± 1.3 [27—31]	28.8 ± 1.6 [26—31]**
Total bilirubin, μmol/L	3.4—20.8	27.7 ± 7.5 [20.8 ± 51.0]	27.6 ± 8.2 [21.9 ± 54.0]
Creatinine, μmol/L	62—115	137.9 ± 16.5 [115.0—177.7]	141.2 ± 12.2 [121.0—166.0]
Urea, mmol/L	2.5—8.3	9.1 ± 1.0 [8.2—12.1]	9.3 ± 0.6 [8.4—10.9]
Glucose, mmol/L	3.5—5.5	6.1 ± 0.7 [5.1—7.7]	6.2 ± 0.6 [5.0—7.7]
C-reactive protein, mg/L	0.8—8.0	105.5 ± 49.7 [38—210]	106.2 ± 51.5 [38—250]
Serum cholesterol, mmol/L	2.9—5.17	4.6 ± 0.3 [3.8—5.2]	4.3 ± 0.5 [3.6—5.2]*
Na^+ serum, mmol/L	130—149	140.9 ± 3.1 [136—150]	140.6 ± 4.3 [133—153]
K+ serum, mmol/L	3.5—5.4	3.9 ± 0.2 [3.5—4.2]	3.7 ± 0.1 [3.5—4.3]**

The difference between the groups is statistically significant: * $p < 0.05$; ** $p < 0.01$.

Table 4. **Dynamics of laboratory parameters of patients with severe acute pancreatitis after 14 days of enteral nutrition**

Index	Rate	Main group (n = 34)	Comparison group (n = 33)
Total serum protein, g/L	65—85	58.4 ± 3.8 [52—64]	56.6 ± 3.1 [52—64]*
Serum albumin, g/L	35—50	32.7 ± 1.8 [27—35]	30.5 ± 1.6 [28—31]**
Total bilirubin, μmol/L	3.4—20.8	21.1 ± 2.1 [18.7 ± 31.2]	22.9 ± 3.4 [19.9 ± 44.2]
Creatinine, μmol/L	62—115	107.9 ± 10.8 [87.0—149.8]	120.7 ± 9.6 [98.8—149.9]***
Urea, mmol/L	2.5—8.3	8.1 ± 0.6 [6.4—9.9]	8.5 ± 0.5 [8—9.9]**
Glucose, mmol/L	3.5—5.5	5.4 ± 0.3 [4.6—6.6]	5.6 ± 0.4 [4.7—6.6]*
C-reactive protein, mg/L	0.8—8.0	101.6 ± 54.5 [23—220]	116.9 ± 63.1 [25—260]
Serum cholesterol, mmol/L	2.9—5.17	4.7 ± 0.3 [3.8—5.1]	4.0 ± 0.2 [3.0—4.9]***
Na^+ serum, mmol/L	130—149	142.2 ± 1.8 [137—146]	141.3 ± 2.1 [136—145]
K+ serum, mmol/L	3.5—5.4	4.1 ± 0.2 [3.5—4.5]	3.9 ± 0.1 [3.5—4.1]**

The difference between the groups is statistically significant: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

vomiting — 4 (12.1 %), diarrhea — 6 (18.8 %), and regurgitation — one (3 %) patient). Despite the fact that the incidence of intestinal complications on the first day after EN in the main group of patients was 10.3 % less, no significant difference between these indicators in the study groups was found ($\chi^2 = 0.23$; 95 % CI 12.9—32.1; p = 0.13). However, after 7 days, there was a significantly lower incidence of intestinal complications in patients of the main group by 21.5 % ($\chi^2 = 4.88$; 95 % CI 2.3—39.5; p = 0.03). Thus, in the main group, intestinal complications were registered in 3 (8.8 %) patients in the form of increased pain, and vomiting and diarrhea were observed in one patient. In the comparison group, intestinal complications were reported in 10 (30.3 %) patients, out of which 4 (12.1 %) patients showed increased pain in the epigastric region and projection of the colon, 5 (15.2 %) — diarrhea, and one (3 %) — vomiting.

The analysis and comparison of the frequency of local complications caused by SAP was also performed in the main group and the comparison group (41.2 % and 48.9 %, respectively) ($\chi^2 = 0.12$; 95 % CI 15.37—29.69; p = 0.5), duration of multiorgan failure (10.5 ± 1.9 [8—16] days and 11.5 ± 1.8 [6—15] days, respectively (p = 0.04)), length of hospital stay (50.7 ± 28.8 [23—124] days and 54.9 ± 32.6 [20—119] days, respectively (p = 0.5), and fatalities (11.8 % and 12.1 %, respectively ($\chi^2 = 0.11$; 95 % CI 16.25—17.07; p = 0.97).

Information on the timing of the start of EN in patients with SAP remains controversial. Thus, according to the recommendations of the experts of the European Society of Clinical Nutrition and Metabolism, in patients with SAP, EN should be started within 24—72 hours after hospitalization, while the early start of nutrition in patients of this category is associated with a decrease in the frequency of infectious complications by 24.2 % and mortality by 32.3 % compared to patients who started EN later [12]. However, in the literature, there are no clear criteria for the initiation of EN in patients with SAP, which is dangerous for complications and deterioration of the patient's condition [13]. Thus, according to experts of the American Gastroenterological Association, early enteral nutrition may not be effective in patients with SAP due to pain, vomiting or intestinal obstruction, so in such cases it is necessary to postpone the start of the introduction of the food mixture for 24 hours [14]. We believe that the restoration of the absorption function of the intestinal wall is one of the criteria for the prescription of EN in patients with SAP. We found that in the vast majority of patients with SAP (70.6 % of patients in the main group and 69.7 % of patients in the control group), recovery of intestinal absorption occurs in an average of 48 hours from the beginning of complex conservative therapy, so it is now optimal to start EN.

It should be noted that, according to the literature, in case of impaired carbohydrate tolerance and severe intestinal paresis when using a test with disaccharides, diagnostic errors may occur, leading to the development of gastrointestinal complications with EN in 15 % of patients [15]. There are also samples with a load of monosaccharides (1 g of fructose or glucose per 1 kg of body weight) and subsequent determination of fasting blood glucose within 2 hours after exercise. An increase in blood glucose concentration indicates the enzymatic activity of the corresponding intestinal disaccharides and is an indication for EN. A flat glycemic curve indicates a violation of glucose transport from the intestinal lumen to enterocytes. If the flattened curve is obtained after loading with disaccharide, and after glucose intake, the glycemic curve is not changed, it indicates a decrease in membrane digestion and is a contraindication to EN. However, the disadvantage of this method is fluctuations in glucose levels, which depend on a large number of factors (carbohydrate metabolism disorders that develop not only in diabetes but also in Itsenko-Cushing syndrome, pheochromocytoma, acromegaly, hyperthyroidism, etc.). For greater reliability and an accurate assessment of the shape of the glycemic curve, a binary test should be performed in which oral glucose is compared with intravenous bolus administration, which may worsen the condition of a patient with SAP.

Therefore, in addition to the application of the method described above, the onset of intestinal absorption was determined by an indicator method developed in our clinic and based on the registration of saliva color change to blue under the action of starch, indicating restoration of salivary excretion of potassium iodide after enteral probe injection. The obtained data on the restoration of intestinal absorption coincided with the data obtained by applying the sample with disaccharides.

In order to improve membrane digestion and absorption as well as reduce the incidence of complications with the use of EN in the treatment protocol of patients with SAP, we proposed the inclusion of simethicone emulsion mixture into the feeding tube at a dose of 2 mL (80 mg) 3—5 times a day. The use of this method made it possible to obtain a significant difference between the indicators of total protein, albumin, cholesterol and K+ serum in the study groups after 7 days and additionally between the indicators of total bilirubin, creatinine, urea and serum glucose after 14 days, although the

levels of glucose and creatinine in the main group corresponded to normal values. In addition, the use of antiflatulents reduced the incidence of intestinal complications after 7 days by 21.5 % ($\chi^2 = 4.88$; 95 % CI 2.3—39.5; p = 0.03) and the duration of multiorgan failure from 11, 5 ± 1.8 days to 10.5 ± 1.9 days, respectively (p = 0.04).

Conclusions

It is established that the restoration of intestinal absorptive function occurs on average after 48 hours from the beginning of complex conservative therapy in patients with SAP, so the use of EN at an earlier date does not make sense.

The method of determining the restoration of intestinal absorptive function in SAP patients using a 3 % potassium iodide solution is quick, safe, and informative.

The use of antiflatulants in the EN mixture improved the laboratory parameters of blood serum, reduced the incidence of intestinal complications by 7 days by 21.5 % ($\chi^2 = 4.88$; 95 % CI 2,3—39,5; p = 0,03), and decreased the duration of multiorgan failure from 11.5 ± 1.8 days to 10.5 ± 1.9 days (p = 0.04).

Declaration of interests

The Authors declare no conflicts of interest.

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Ethics approval and written informed consents statements

The assessment and usage of all clinical data was approved and permitted before the study by the ethics committee of Bogomolets National Medical University. The study protocol conformed to the ethical guidelines of the «World Medical Association (WMA) Declaration of Helsinki — Ethical Principles for Medical Research Involving Human Subjects» adopted by the 18th WMA General Assembly, Helsinki, Finland, June 1964 and amended by the 59th WMA General Assembly, Seoul, South Korea, October 2008.

Written informed consent was obtained from all individual participants included in the study.

Authors contributions

I. V. Kolosovych: conception or design of the work, drafting the aricle, critical revision of the article; I. V. Hanol: data collection, data analysis and interpretation, drafting the article.

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Особливості застосування ентерального зондового харчування у пацієнтів з тяжким перебігом гострого панкреатиту

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У загальній структурі захворювання на частку гострого панкреатиту з тяжким перебігом припадає 20 %. Гострий панкреатит потребує лікування у відділенні інтенсивної терапії та реанімації. Супроводжується високим ризиком виникнення ускладнень (до 50 %) та летального наслідку (40—70 %). Раннє застосування ентерального зондового харчування у пацієнтів з гострим панкреатитом значно поліпшує стан кишкової стінки та перебіг захворювання в цілому, зменшуючи кількість ускладнень і знижуючи рівень летальності.

Мета — вивчити терміни відновлення кишкового всмоктування як одного з головних критеріїв початку ентерального зондового харчування у пацієнтів з тяжким перебігом гострого панкреатиту та поліпшити результати комплексного лікування шляхом профілактики його ускладнень.

Матеріали та методи. Дослідження ґрунтувалося на результатах обстеження та лікування 67 хворих на тяжкий гострий панкреатит. Залежно від лікувальної тактики хворих розподілили на дві групи: порівняння (стандартне ентеральне зондове харчування) — 33 пацієнти та основну (стандартне ентеральне зондове харчування з додаванням антифлатулентів у складі суміші) — 34 пацієнти. Для визначення термінів відновлення кишкового всмоктування перед початком ентерального зондового харчування виконували пробу з дисахаридами (лактулоза/манітол), які не метаболізуються, і тест із 3 % розчином калію йодиду.

Результати. У 70,6 % пацієнтів основної групи та 69,7 % — групи порівняння відновлення кишкового всмоктування зареєстрували лише через 48 год від початку лікування. Через 7 та 14 діб застосування ентерального зондового харчування виявлено статистично значущу різницю між групами за показниками загального білка, альбуміну, холестерину та K+ у сироватці крові ($p < 0,05$). Через 7 діб відзначено статистично значущо нижчу на 21,5 % частоту виникнення кишкових ускладнень у пацієнтів основної групи ($\chi^2 = 4,88$, 95 % довірчий інтервал 2,3—39,5; $p = 0,03$).

Висновки. Застосування методу із 3 % розчином калію йодиду для визначення відновлення кишкового всмоктування у хворих з гострим панкреатитом є швидким та інформативним. Використання антифлатулентів у складі суміші для ентерального зондового харчування дало змогу поліпшити лабораторні показники сироватки крові, зменшити частоту розвитку кишкових ускладнень на 7-му добу і тривалість поліорганної недостатності з ($11,5 \pm 1,8$) до ($10,5 \pm 1,9$) доби ($p = 0,04$).

Ключові слова: гострий панкреатит, кишкове всмоктування, ентеральне зондове харчування, кишкові ускладнення.

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