Individual approach to ensure nutritional support of patients with acute pancreatitis

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Key words: acute pancreatitis, nutritional support, energy deficiency, protein metabolism, individual approach

Introduction

Recently, clinicians, form conductive intensive therapy program, along with the problems of adequate perfusion and oxygenation of tissue, water-electrolyte homeostasis in the body of the patient, pay more attention to one cardinal problem. This - providing the necessary conditions for the existence of the patient's body as a biological system: the ingestion of exogenous substances into the body that ensure the energy and plastic needs of this system. Such substances can be called food substrates, and the totality of the processes associated with the intake and assimilation of food substrates is usually referred to as nutrition.

Disturbances in nutrition significantly reduce the effectiveness of treatment, increase the risk of septic and infectious complications, increase the length of stay in the hospital, and worsen the rates of lethality.

Traditionally, calculation and implementation of nutritional support is based on the degree of nutritional insufficiency, without taking into account the state of functional systems that regulate metabolic processes in the body and the functional state of the organism as a whole. In our study, we tried to approach this problem somewhat from the other side: relying on the state of energy exchange of the organism, which was the purpose of this study.

The aim of the study was to visualize the ongoing nutritional support in patients with acute pancreatitis, depending on the type of energy deficiency.

Material and methods

The study included observations of 48 surgical patients with acute severe and moderate pancreatitis, according to the current classification of acute pancreatitis [4, 5]. The age of the patients varied from 45 years to 61 years.

Assessment of the severity of the condition was assessed on the ARASNE III scale with the help of monitored indices in water-electrolyte, acid- alkaline homeostasis, hemodynamics, endogenous intoxication, and a number of biochemical indices. Nutritional status was assessed according to the order in number 330 from 5.08.03 by anthropometric and laboratory methods, the

calculation of energy and nutrient requirements was also carried out. Nutritional support was carried out as follows:

1. The daily requirement for nutrients was replenished with enteral - nutrient mixtures authorized and recommended by the order of the Ministry of Health of the Russian Federation No. 330, and parenterally by solutions of lipids, amino acids, carbohydrates.

2. Nutrition was conducted through a naso-intestinal tube.

3. Jn testinalnaya insufficient accuracy did not exceed 2 steps.

4. Infusions with ZP and albumin were not performed.

5. All patients were on mixed diet.

Condition and type of energy the energy deficit was estimated according to the developed algorithm at mu (Fig. 1) [1, 4].

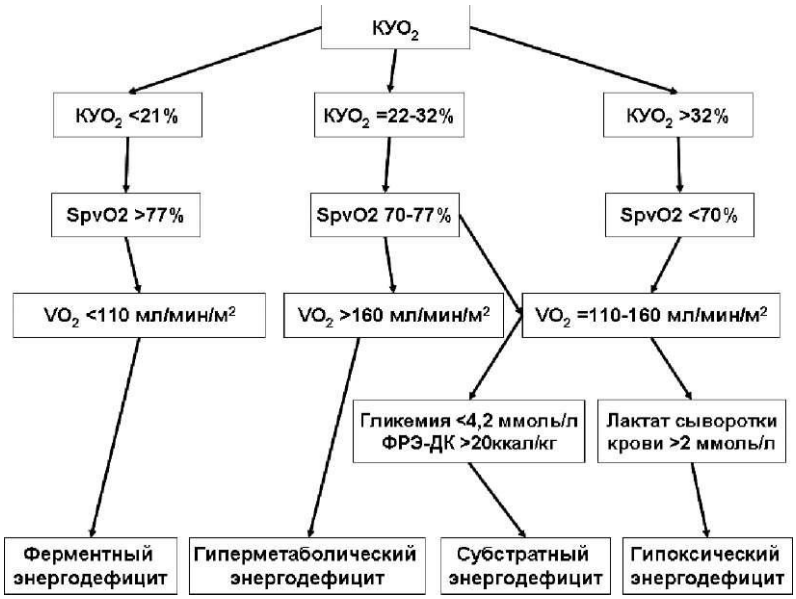

Fig. 1. Differential diagnostics of energy deficiency.

Note: SpvO $_2$ - venous saturation, VO $_2$ - consumption of O $_2$, MCO $_2$ - utilization rate O $_2$, EDE - actual energy expenditure, DC - delivered calorie.

We have developed an individualized approach to nutritional support ongoing e in patients with acute pancreatitis depending on the type of energy deficiency (Table. 1).

All study patients were divided into 2 groups: Group 1 patients received nutritional support according to individualize at mu algorithm, depending on the type of energy deficiency (Table 1.); Group 2 patients were prescribed nutritional support according to the recommendations of the National parenteral and enteral nutrition management [2, 3,4], excluding the states of energy (Table. 1).

Table 1

Optimization of nutritional support for patients with destructive pancreatitis

Enzyme energy deficiency	Hypoxic energy shortage	Substrate energy deficiency	hypermetabolic th energy shortage
nutritional support - relative hypoalimentation (15 - 20 kcal / kg day) + intensive therapy: drugs ↑ metabolic rate	standard nutritional support (25 - 30 kcal / kg / day) +intensive therapy: relief of hypoxia and normalization ofMTC $_2$	nutritional support using standard calculations and recommendations for patients with MTO (25 - 30 kcal / kg /day)	nutritional support - relative hyperalimentation (30 - 35 kcal / kg / day) +intensive care: drugs ↓ metabolic rate
↓ intensity substrate load at night and ↑ substrate load during the day, especially in the second half of the day is, (under the control of serum levels of metabolites)			

Criteria for excluding patients from the study:

1. Pronounced decompensation of homeostasis.
2. Using deep sedation.
3. Mixed forms of energy deficiency or lack thereof.

Table 2

Characteristics of study groups

	Group 1	Group 2
n	36	12
APACHE III	43 (21 - 83)	57 (33 - 95)
age	45 - 61 year	52 - 60

In the statistical analysis of intergroup differences of evaluation conducted Nepara metric criterion Kruskal Uolisa and evaluation connection attributes within the group ofSmirmena correlation coefficient. The results were evaluated retrospectively.

Results and its discussion

As a result of analysis of the data can be seen (Fig. 2), that is, as a result of optimization carried out nutri tive support in the control group to 5 days there is a significant street uchshenie nutritionally indicators of status. In hypermetabolic, hypoxic energy deficits for 5 to 6 days, nutritional insufficiency from the severe became mild. Normalization of nitrogen losses occurred already on the 5th day. With substrate the standard nutritional support led to the best results. It was possible to achieve normalization of all monitored indices: albumin and total protein on day 7, AChL, nitrogen losses - for 3 - 4 days. That is, you can talk about eliminating nutritional insufficiency by 7 days.

When enzyme deficiency against the background of an optimized nutri tive support was no less pronounced positive dynamics of increase in albumin, total protein and Absolute Numbers la lymphocytes. This suggests that enzyme energy deficiency is the most severe form of hypoergosis due to the extremely low conjugation of the processes ofenergy production and synthesis. And, most likely, is neblagop riyatny about Mr. nostichesky character with respect to Mr. Awn mortality and timing Preben Bani hospital.

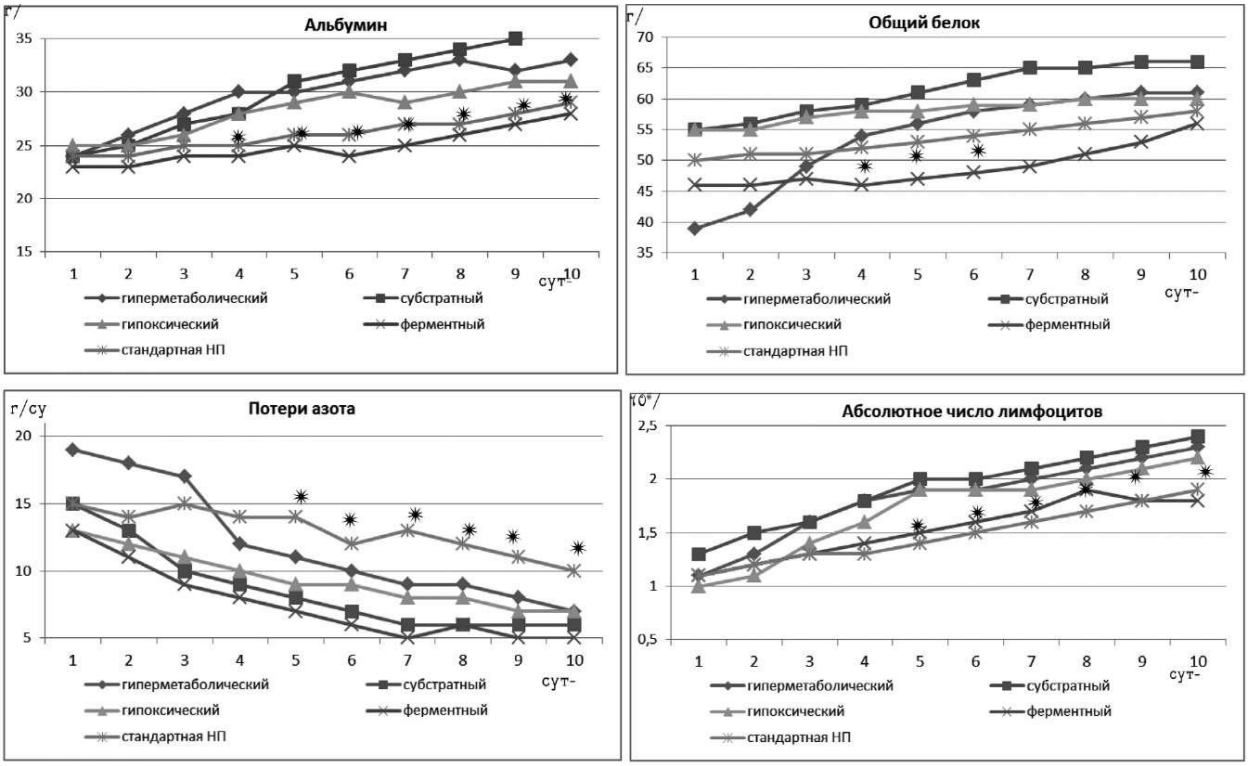

Fig. 2. Dynamics of indicators of protein metabolism.

* - on the charts p <0,05 in relation to other values.

However, when analyzing the monitored indicators of the control group, a clear lag in their dynamics is clearly visible. Significant improvement in nutritional status began only 9 to 10 days. Moreover, in the control group there were significantly higher values of glycemia and triglyceridemia (Table 3), which can be regarded as a complication of ongoing nutritional support. These facts suggest that the standard routine nutritional support on the part of a group of patients to ntrolya was gipoalimentatsionnoy and did not allow fast enough to normalize indicators nutri tive status. And in some patients - hyperalimentation and caused the development of hyperglycemia and hypertriglyceridemia.

Table 3

Glycemia and triglyceridemia

Indicators	Control group	Comparison group			
		Hypermetabolic energy shortage	Substrate energy shortage	Hypoxic energy shortage	Enzymatic energy deficiency
Glycemia venous, mmol / l	13.8 * (8.2 - 18.5)	11.9 (6.6 to 13.5)	6.5 (4.2 - 7.5)	9.7 (5.4 - 11)	6.4 (4.9 - 7)
Triglyceride emulsion, mmol / l	4.0 * (2.9 - 4.4)	3.3 (2.5 - 3.5)	2.3 (1.7 - 2.5)	2.4 (1.7 - 2.6)	2.1 (1.6 - 2.4)

* - p <0,05 in comparison with the control group. Data are presented as a median and percentiles of 25% and 75%.

Prospects for this study are:

– at individualization nutritional support and rational use of nutrients on the basis of energy sharing ;

– in raising the economic efficiency of treatment on this basis.

Conclusion

Individualization of nutritional support, depending on the type of energy shortage allows, on the one hand, reduce the nutritional deficiency to light as early as 5 days, more than 2-fold improved NDICATORS nutritional status, and on the other - to avoid the development of complications of nutritional support.

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The article studies the issues of nutritional support and its optimization for various types of energy deficiency in surgical patients with acute pancreatitis. The author presented the results of his own study, which included patients with moderate and severe acute pancreatitis. Patients are divided according to the type of energy deficiency (enzymatic, hypoxic, substrate, hypermetabolic). An algorithm for differential diagnosis of energy deficiency types and associated nutritional support is presented. The author achieved an effective individualized nutritional support for patients with acute pancreatitis.