

# NUTRITIONAL SUPPORT OF PATIENTS WITH HEPATOPANCREATODENAL TUMORS: A KEY ELEMENT OF INTENSIVE CARE IN THE POSTOPERATIVE PERIOD

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## ABSTRACT

**Relevance:** Effective intensive therapy of complications arising from malignant neoplasms of the hepatopancreatoduodenal region remains an urgent task. It aims to eliminate energy deficiency, restore body weight, and normalize plastic processes that are disrupted due to severe hypercatabolism, increased body needs for nutrients, and the development of intoxication syndrome, especially in the postoperative period.

**The study aimed to** research the key aspects of nutritional support in patients with tumors of the hepatopancreatoduodenal region by studying and comparing the effectiveness of isolated enteral, parenteral, and mixed nutritional therapy in the early postoperative period.

**Methods:** The study involved 91 patients over 18 years old with hepatopancreatobiliary malignancies. Patients were divided into three groups depending on the type of nutritional support. The study assessed nutritional status indicators, including screening results, body mass index, basal metabolic rate, and key laboratory indicators: the level of lymphocytes in the blood, total protein, total bilirubin, and ALT and AST activity.

**Results:** With parenteral nutritional support according to the screening protocols used, by Days 10-12, 17 patients maintained a "normal" nutritional status, 14 patients had "moderate malnutrition" with regression of "severe malnutrition" in 1 patient (3.2%). In the mixed nutrition group, by Days 10-12 of the postoperative period, there was an increase in patients with "moderate malnutrition" according to the SGA and NRI scales by 10% and 6.7%, respectively, with complete elimination of signs of "severe malnutrition" according to the given nutritional assessment scales ( $p < 0.005$ ).

**Conclusion:** In the group with isolated parenteral nutrition, sufficient effectiveness in stabilizing and maintaining the nutritional status of patients was achieved, which was manifested in an increase in the number of patients with "moderate" and "normal" nutritional status, as well as a decrease in the number of patients with severe and moderate nutritional deficiency.

Mixed nutritional support can be considered a promising alternative to parenteral nutrition since the indicators of the nutritional status of patients achieved in this group were statistically similar to the results of parenteral therapy.

**Keywords:** nutritional status, nutritional deficiency, nutritional support, sipping, oncology, nutrition, tumors of the hepatopancreatoduodenal region.

**Introduction:** Treatment of hepatopancreatoduodenal tumors and their complications is one of the key tasks of oncologists and intensive care specialists. The relevance of this problem is due to the increase in the number of patients with oncological diseases of the abdominal cavity, which require external energy supplementation and correction of nutritional status in the postoperative period. This growth is observed even against the background of improvement of non-invasive diagnostic methods for tumors of the abdominal cavity and hepatopancreatoduodenal zone [1, 2].

Tumors of the hepatopancreatoduodenal zone occupy a special place among malignant neoplasms, as they are often accompanied by complications such as mechanical jaundice, liver failure, and nutritional deficiency in the perioperative period, which significantly increases the risk of death.

To identify nutritional deficiencies, screening methods recommended by the international clinical nutrition asso-

ciations ASPEN (American Society of Clinical Nutrition and Metabolism) and ESPEN (European Society of Clinical Nutrition and Metabolism) are used. These methods include patient questionnaires, the use of standard anthropometric and laboratory indicators, which allow for an objective assessment of nutritional status and the degree of its impairment [3, 4].

Early detection of tumors and assessment of nutritional status at the outpatient examination stage could reduce the risk of complications through the use of modern screening methods and assessment scales (Subjective Global Assessment, SGA; Nutritional Risk Index, NRI). These tools allow the timely initiation of nutritional therapy in combination with surgical treatment [4, 5].

Particular attention should be paid to the prevention of early postoperative complications, since up to 70-80% of cancer patients suffer from varying degrees of nutritional deficiency. This condition is aggravated by severe hy-

percatabolism and an increased need for nutrients, which contributes to the development of complications in the postoperative period.

The choice of the optimal nutrition method remains a pressing issue for many clinicians and researchers. The need for an individual approach is due to the complexity of surgical interventions in the hepatopancreatoduodenal zone. However, existing methods and strategies are still insufficiently covered in the literature, which emphasizes the need for further study and implementation of these approaches in clinical oncology.

**The study aimed to** research the key aspects of nutritional support in patients with tumors of the hepatopancreatoduodenal region by studying and comparing the effectiveness of isolated enteral, parenteral, and mixed nutritional therapy in the early postoperative period.

**Objectives of the study:** 1) to conduct a comparative assessment of the dynamics of nutritional deficiency and nutritional status of patients operated on for malignant tumors of the hepatopancreatoduodenal zone in the early postoperative period using isolated enteral, isolated parenteral and mixed types of nutrition; 2) to analyze the dynamics of protein and carbohydrate metabolism, the viability of liver function in cancer patients operated on for malignant tumors of the hepatopancreatoduodenal zone using the presented types of energy supplementation in the early postoperative period. This material is a continuation of the previous article [6], in which we analyzed the main aspects and published the intermediate result. This article contains the final results of the study, discussions, and conclusions.

**Materials and Methods:** This prospective, longitudinal, parallel study and retrospective analysis of treatment results involved 91 patients over 18 years old with hepatopancreatobiliary malignancies, including 49 men and 44 women.

Depending on the volume, severity, and prevalence of the oncological process, the appropriate volume of surgical intervention was undertaken, which was radical or palliative: 1) resection of various segments of the liver; 2) hemihepatectomy; 3) transhepatic drainage of the right and left hepatic duct; 4) bypass gastroenteroanastomosis or cholecystoenteroanastomosis with interintestinal entero-enteroanastomosis according to Brown; 5) gastro-pancreatoduodenal resection; 6) corporo-caudal resection of the pancreas with splenectomy.

The most common (84.7%) were combined surgical interventions affecting the intestines, liver, and pancreas simultaneously. This was due to the significant volume and growth of the oncological process in this area, which was associated with complete temporary intestinal failure in the early postoperative period.

In some patients (n=28, 30%), the disease was accompanied by obstructive jaundice, which required a preliminary or intraoperative decompression of the bile

ducts. Postoperative jaundice lasted for  $15.5 \pm 3.3$  days on average.

Group I included patients on enteral nutrition after surgery (n=30); Group II – patients on parenteral nutrition (n=31); and Group III – patients on mixed nutrition as a type of partial parenteral nutrition regimen (n=30).

At the first stage, the clinical condition of patients was assessed according to the SGA and NRI screening protocols before surgery and on Days 10 and 12 after surgery.

A comparative assessment of the clinical effectiveness of using types of nutritional support in a complex of therapeutic measures after the specified operations in the hepatopancreatoduodenal zone was carried out.

The main indicators of nutritional status were also assessed: body mass index (weight was measured before surgery, on Day 10 and Day 12), basal metabolic rate (calculated using the Harris-Benedict equation based on the patient's anthropometric data (gender, age, weight and height), laboratory indicators: blood lymphocytes, total protein, total bilirubin, ALT, AST levels, related to routine methods of assessing nutritional status [6, 7].

In each group of patients, nutritional support in the postoperative period was carried out from Day 2, based on the average calculated value of energy requirement of 35 kcal/kg, using highly concentrated glucose solutions (10%, 20%), which allowed achieving the required energy supply in the postoperative period without increasing the volume of daily volume support. 20% glucose solutions were administered from Day 3 till the transfer of patients to the specialized department. To assimilate separately administered glucose, short-acting insulin was used at the rate of 1 U of insulin per 4 grams of dry glucose [8-10].

Patients in the group with isolated enteral nutrition were given nutritional mixtures through a nasogastric tube at a rate of 25-35 ml/single administration in a total volume of 500-700 ml/day, with a subsequent increase in volume in the following days by 10-20%, provided that it was absorbed. The frequency of administration of the mixture varied depending on the clinical condition of the patients and the results of laboratory examination. In this case, the maximum rate of administration of the mixture did not exceed 125 ml/hour. Administration was carried out for 18-20 hours during the day, then a break was taken, usually at night.

Patients in the mixed feeding group received combined nutritional support parenterally from Day 2. Once intestinal peristalsis appeared, vomiting and severe gastrointestinal paresis were absent, and they were provided with oral or nasogastric tube feedings at the specified rate. In case of persistence of gastrointestinal paresis, the percentage of the enteral part was reduced in favor of parenteral dosing of plastic materials to ensure the required daily caloric intake [10, 12].

#### *Methods of statistical data analysis*

The quantitative and qualitative indicators obtained

during the study were analyzed using descriptive and analytical statistics. Pairwise comparisons of laboratory indicators were performed depending on the time of the survey using the Wilcoxon T-test, significance level  $\alpha$  (taking into account the Bonferroni correction). The Friedman criterion was used to analyze repeated measurements.

The resulting level of statistical significance "P" characterized the compliance of the distribution with the normal law (if  $p>0.05$ , the distribution was considered to corre-

spond to the normal distribution; if  $p\leq 0.05$ , the distribution was considered to not correspond to the normal distribution. The level of statistical significance was fixed at the error probability level of 0.05.

**Results:** The nutritional status of patients in all three groups before surgery and during Days 10-12 after surgery relative to the clinical scales for assessing nutritional status, SGA, and NRI was assessed as normal, moderate, and severe malnutrition (Figures 1-3).

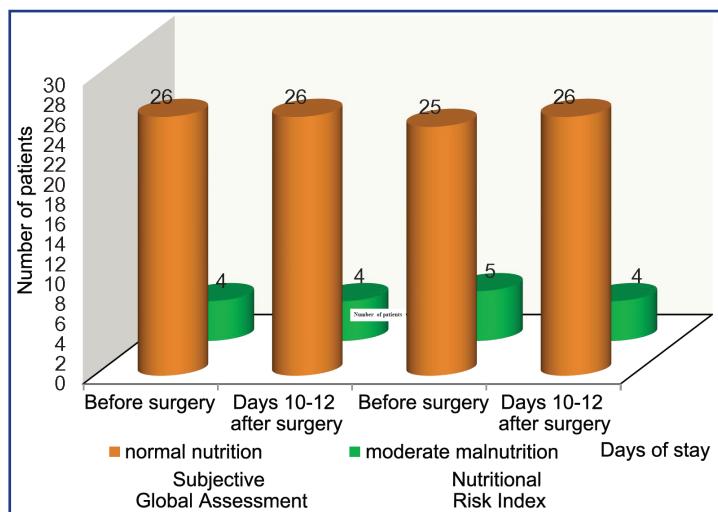


Figure 1 – Dynamics of nutritional status of patients in Group 1 with enteral support

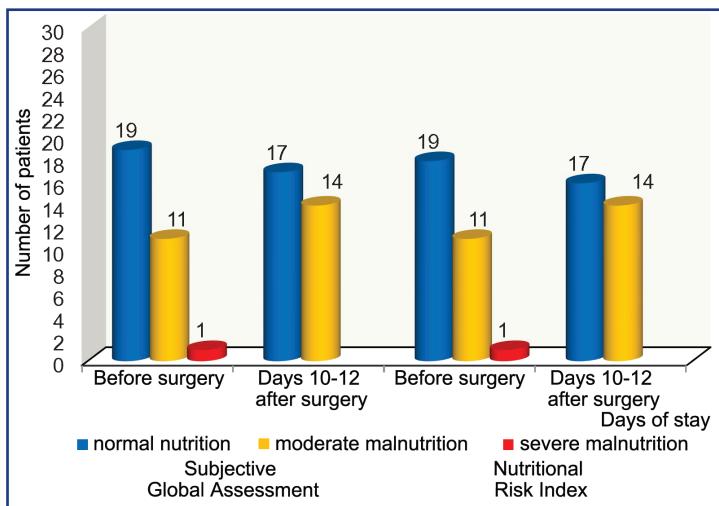


Figure 2 – Dynamics of nutritional status of patients in Group 2 with parenteral support

As can be seen from the data presented in Figures 1-3, in the preoperative period, according to the SGA scale, 24 patients of Group 1 (80%), 19 patients of Group 2 (61.3%) and 17 patients of Group 3 (56.7%) had a normal nutritional status before surgery compared to patients with "moderate" and "severe" malnutrition. The assessment of the nutritional status before surgery using the NRI scale made it possible to confirm the nutritional status in the overwhelming majority of patients in all groups ( $n=62$ ) as relatively "normal" or true negative

(normal) nutritional status [1, 2, 5]. True positive (moderate malnutrition) nutritional status was observed in 26 patients, and severe malnutrition in 3 patients. The NRI data in this period had a strong correlation with the SGA scale results ( $p<0.005$ ).

On Days 10-12 after surgery, the results of the assessment according to the SGA scale remained unchanged in patients of Group 1; according to the NRI assessment scale, an increase in "moderate malnutrition" was noted per patient (3.3%).

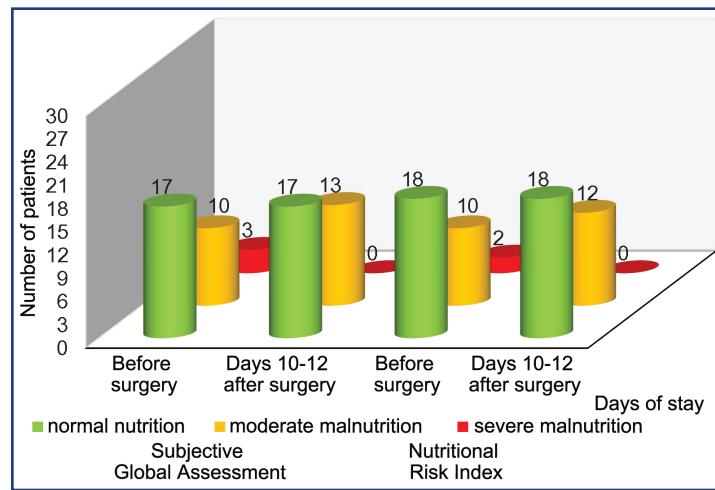


Figure 3 – Dynamics of nutritional status of patients in Group 3 with a mixed type of nutritional support

With parenteral nutritional support, 17 patients had "normal nutrition", 14 patients had "moderate malnutrition," with regression of "severe malnutrition" in 1 patient (3.2%). In the mixed nutrition group, there was a complete elimination of signs of "severe malnutrition" according to the given scales ( $p<0.005$ ), but with an increase of 10% (SGA) and 6.7% (NRI) of patients with "moderate malnutrition".

In patients in the groups with enteral and parenteral nutrition, by the end of these types of energy supplementation (10-15 days), the level of basal metabolism was ob-

served to approach its initial values –  $2500.1\pm353.4$  kcal/day and  $2350.0\pm330.5$  kcal/day, respectively, which indirectly confirmed the effectiveness of the types of nutritional support used.

With a mixed type of nutrition, a statistically significant approach of the basal metabolic rate to its initial values was noted at an earlier stage – by Days 6-8 after surgery ( $2250.0\pm105.2$  kcal/day), which allows us to conclude that this option of nutritional support is more effective in covering the energy costs of patients in comparison with isolated types of nutrition ( $p<0.03$ ) (Figure 4).

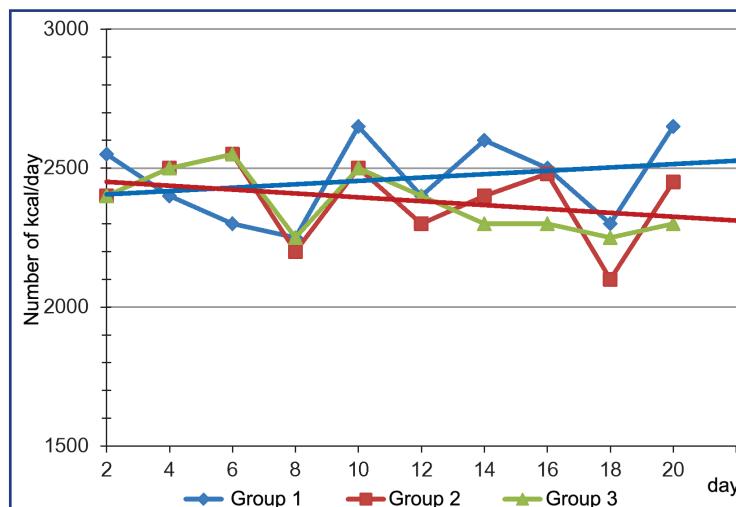


Figure 4 – Comparative analysis of the dynamics of the basal metabolic rate in patients of the three groups in the early postoperative period, kcal/day

The presented analysis of the dynamics of the basal metabolic rate in patients of three groups indicates an earlier detection of the compliance of the basal metabolic rate in patients with a mixed type of nutrition compared to the initial one, which may, in turn, indicate a faster "coverage" of the energy deficit in patients after surgery, despite the increased number of patients with "moderate malnutrition".

In this case, it can be argued that what is important is not so much the speed of covering the calculated value of the basal metabolism, but the target effectiveness of the type of nutrition used to eliminate nutritional deficiency.

Evaluation and subsequent analysis of the average results of laboratory examination in groups of patients in a comparative aspect showed a relatively slow and gradu-

al decrease in the level of total blood protein by Day 5 after surgery, on average, by  $6.8 \pm 0.95\%$  of the initial values, which, apparently, was due to increased catabolism and ongoing protein losses (exudation, drainage, etc.) with a fairly reliable increase by the end of nutritional support, on average by 8.47% of the initial values.

**Table 1 – Laboratory parameters of blood tests by study groups**

Laboratory indicators	Groups					
	Group 1 (n=30)		Group 2 (n=31)		Group 3 (n=30)	
	Before surgery	Days 10-12 after surgery	Before surgery	Days 10-12 after surgery	Before surgery	Days 10-12 after surgery
Total protein	52.2-62.4 $\pm$ 6.2 g/l (M=55.6 g/l)	58.0-68.2 $\pm$ 5.1 g/l (M=61.3 g/l)	53.8-61.4 $\pm$ 4.2 g/l (M=57.3 g/l)	55.0-63.3 $\pm$ 3.7 g/l	56.5-65.4 $\pm$ 5.2 g/l (M=52.3 g/l)	60.0-70.2 $\pm$ 4.2 g/l (M=58.7 g/l)
Lymphocytes	8.4-16.0 $\pm$ 4.2% (M=11.2%)	16.1-23.5 $\pm$ 4.2% (M=8.95%)	10.2-14.7 $\pm$ 3.1% (M=8.95%)	11.6-19.4 $\pm$ 4.3% (M=10.35%)	7.8-16.3 $\pm$ 4.2% (M=15.4%)	12.4-23.7 $\pm$ 4.0% (M=19.9%)
ALT and AsAT	78.2%	40.15%	81.6%	66.7%	72.6%	63.8%

When analyzing the change in the number of blood lymphocytes, it should be noted that before the operation, the relative level of blood lymphocytes in the three groups was significantly reduced ( $25.9 \pm 3.7\%$ ), but, given the methods and volumes of the operation, the stress of the cellular and humoral links of the immune system, the dynamics of their level was expressed in the form of a statistically significant increase in the level of lymphocytes in the postoperative period by Days 10-12 – a stable increase in the level of blood lymphocytes by Day 10 after surgery by 8.95% (p=0.000) in Group 1, 10.35% (p=0.003) in Group 2, and 10.91% (p=0.000) in Group 3.

A comparative analysis of the dynamics of the ALT and AST blood levels in the study groups on Days 10-12 after surgery revealed an initial excess of their normal values after surgery in some patients, by tens of times on Day 1, followed by a decrease.

In particular, the dynamics of blood transaminase levels in most patients of Group 1 (n=23, 78.2%) by Day 10 were expressed as a decrease in ALT (by 32.1%) and AST (by 40.15%) from the initial preoperative level.

The overwhelming majority of patients in Group 2 (81.6%, n=26) also showed a statistically significant decrease in the level of these blood transaminases, on average, by 72.2% by Day 5 and by 66.7% by Day 10 after surgery compared to the baseline.

With a mixed type of nutritional support, by Day 5 after surgery, the average statistically significant decrease in transaminases was, on average, up to 72.6% of the initial values (p=0.000), by Day 10, their level decreased to 63.8% of the previous value achieved on Day 5 (p=0.008).

Regarding the dynamics of the level of total bilirubin in the blood, it should be noted that its high values persisted during Day 1 after surgery, which was most likely due to temporary swelling of the bile ducts and difficulty in the outflow of bile into the intestinal lumen, which caused the total bilirubin in the blood to exceed the norm by more than 10 times (p=0.000).

Thus, a statistically significant increase in the level of total blood protein was noted in the mixed nutrition group (p=0.004). In the groups with enteral and parenteral nutrition, differences in the dynamics of the level of total protein were found at the level of statistical tendency: p=0.108 and p=0.129, respectively (Table 1).

On average, on Days 5-7, all study groups showed a 5-6-fold decrease in their level from the baseline, with a gradual decrease to normal values by Days 10-12, which persisted in some patients until their discharge (p=0.004).

In comparative quantitative equivalent, in patients of Group 1, a decrease in the level of total bilirubin was recorded, on average, by 12.7% only by Day 10 after surgery (p=0.187). In Group 2, the total bilirubin in blood decreased on average by 40.09% by Day 5 and by 45.0% by Day 10 from the baseline (preoperative period) (p=0.002).

Patients in the 3rd group showed a slower regression of this indicator: a decrease, on average, of 20.0% by Day 5 and 44.0% by Day 10 after surgery.

**Discussion:** Assessing the results of the study, in particular the dynamics of nutritional status according to the NRI and SGA scales, it can be noted that the most pronounced tendency to normalize nutritional status was observed with parenteral support. This was expressed in an increase in the number of patients with "moderate malnutrition" by an average of 9.7% (n=3) on both scales, which was associated with the complete elimination of severe nutritional deficiency, and not with an absolute increase in the number of patients with "moderate malnutrition".

Similar results in terms of stabilization of nutritional status were demonstrated by the group with a mixed type of nutrition, where an increase in the proportion of patients with "moderate malnutrition" by 10% and 6.7% on the scales was also noted, which is also associated with a complete regression of severe nutritional deficiency. In this group, despite the lack of a significant increase in patients with "moderate malnutrition", an improvement in laboratory parameters and a more rapid restoration of the basal metabolic rate were observed.

Patients receiving isolated enteral support demonstrated relatively better results according to the assessment scales. The increase in the number of patients with "moderate malnutrition" in the postoperative period was only 3.3% (n=1) according to the NRI scale. However, in comparison with other groups, this category did not

show complete elimination of moderate nutritional deficiency and the transition of patients to the category with "normal" nutritional status, which indicates the absence of pronounced dynamics of nutritional improvement in this group.

The results of this work, indicating the presence of nutritional deficiency in patients before surgery, are consistent with the studies of V. M. Khomyakov and A. D. Ermoshin (2015). Their work presents data on the use of nutritional status screening scales (NRS, SGA, and NRI) to assess the condition of cancer patients at the preoperative examination stage. This made it possible to promptly identify early signs of nutritional deficiency and develop recommendations for the initiation of early nutritional support aimed at reducing the risks of postoperative complications and accelerating the recovery of patients [1].

Confirmation of the presence of nutritional deficiency in patients with pancreatic cancer before surgery is also presented in the study by N. Bibby et al. (2023). Their work analyzed data from 137 patients who underwent surgery for the underlying disease. The results showed that in 62.3% of patients, malnutrition led to a weight loss of more than 5%, and in 29.2% of hospitalized patients, more than 10% of the initial weight over the past 6 months [5].

The improvement in nutritional status in the postoperative period noted in this study was achieved due to the nutritional methods used. According to their data, the average weight gain in patients was 1.8% over two weeks, with an overall improvement in weight of 7.9%. Similarly, in the study by N. Bibby, an increase in the Patient-Performing Subjective Global Assessment (PG-SGA) scale was observed by an average of 6.19% [5].

The dynamics of the restoration of the basal metabolic rate, as reflected in the trend analysis, show that with enteral and parenteral support, it reached the initial values only by Days 10-12 after surgery ( $2500.1 \pm 353.4$  kcal/day and  $2350.0 \pm 330.5$  kcal/day, respectively). However, with the mixed type of nutritional support, the basal metabolic rate approached the initial value ( $2250.0 \pm 105.2$  kcal/day) faster by Days 6-8 after surgery. This acceleration, however, was not accompanied by an earlier restoration of independent nutrition of patients and did not ensure the complete elimination of moderate nutritional deficiency. Instead, an increase in the number of patients with this type of nutritional status disorder was noted.

The correspondence between the level of the calculated basal metabolism and the "energy intensity" of the total nutritional subsidy with a mixed type of nutrition and isolated enteral support is probably due to the preservation or restoration of parietal digestion in the gastrointestinal tract in the early postoperative period, even in the presence of intestinal paresis of varying degrees.

The dynamics of protein metabolism showed that by the time patients were transferred from intensive care to a specialized department, the mixed type of nutritional sup-

port provided a more pronounced and statistically significant increase in the level of total blood protein.

The increase in the level of blood lymphocytes recorded in all groups can be considered as the body's response to surgical intervention, which probably indicates a positive effect of these changes on the immune status of patients.

An increase in the level of blood lymphocytes may indirectly indicate a positive effect on the immune status of patients when using all studied types of nutrition in the postoperative period in this contingent.

As for the dynamics of the level of transaminases and total bilirubin in the blood, statistically significant increases in the levels of ALT and AST, and, to a lesser extent, total bilirubin, are observed in patients of all three groups (n=91, 100%). These changes can be explained, first of all, by the surgical intervention itself and its volume, as well as by the underlying disease of the hepatopancreatoduodenal zone, which is associated with the development of cytolytic syndrome against the background of cholestasis.

Between Days 5-6 and Days 10-12 post-surgery, blood transaminase levels decreased. A strong direct correlation was observed between the total bilirubin level in the blood and the decrease in transaminase levels in patients across all groups. This is probably due to the creation of adequate intraoperative bile outflow due to drainage of the bile ducts and elimination of the cause of mechanical jaundice (tumor).

Although nutritional support had a certain effect on the dynamics (including the decrease) of serum transaminases and total blood bilirubin, surgical intervention also played a significant role in these changes. It contributed to the improvement of bile outflow, the elimination of mechanical jaundice (tumor removal), and a resulting decrease in the severity of cytolytic syndrome due to the surgical intervention.

The results of this study, aimed at targeted and early initiation of nutritional support in the considered group of patients, closely correlate with the results of the meta-analysis by F. Yang et al. (2018), taking into account the results of 2307 cases from 26 studies. This meta-analysis emphasizes the effectiveness of early initiation of nutritional support as a safe and manageable means of facilitating the recovery of patients in China. In particular, it contributes to a more rapid recovery of gastrointestinal motility and a reduction in the duration of postoperative hospital stay of patients [8].

**Conclusion:** 1. According to the NRI and SGA nutritional status assessment scales, parenteral and mixed nutrition throughout the study period demonstrated higher efficacy in stabilizing the clinical condition of patients and in reducing severe nutritional deficiency compared to the group receiving isolated enteral nutrition.

2. A mixed type of nutrition in the postoperative period in patients operated on for malignant neoplasms of the

hepatopancreatoduodenal zone, based on the totality of the dynamics of clinical and laboratory indicators, can be considered as an alternative method of isolated parenteral nutrition, mainly due to the complete regression of severe nutritional deficiency and the preservation of a higher percentage of patients with a "normal" nutritional status in the perioperative period.

3. Although the rate of restoration of the calculated level of basal metabolism approaches the initial values before surgery, this indicator, regardless of the type of nutritional support, cannot serve as a completely reliable criterion for the effectiveness of nutrition in the postoperative period, since there is no clear correlation between the dynamics of its values and the elimination of different degrees of nutritional deficiency.

In patients with malignant tumors of the hepatopancreatoduodenal zone, when there is an indication for nutritional support in the early postoperative period, it is necessary to assess the degree of nutritional status using the SGA and NRI screening scales. In signs of mild nutritional deficiency, one of the three methods of nutritional support is allowed: isolated enteral, isolated parenteral, or mixed nutrition, due to their statistically equivalent effect on the level of basal metabolism and laboratory test results. In cases of moderate and severe nutritional deficiency, it is recommended to use a mixed type of nutritional support, which promotes faster restoration of protein balance, a decrease in the value of basal metabolism, and, in this regard, a reduction in the duration of hospitalization.

It is recommended to begin nutritional support from Day 2 after surgery, regardless of the scope of the surgical intervention, the severity of the patient's condition in the preoperative period, and the degree of the initial nutritional status, to avoid worsening nutritional deficiency.

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#### **АНДАТИА**

## **ГЕПАТОПАНКРЕАТОДУОДЕНАЛЬДЫ ІСІКТЕРІ БАР НАУҚАСТАРДЫ ТАҒАМДЫҚ ҚАМТАМАСЫЗ ЕТУ: ОПЕРАЦИЯДАН КЕЙІНГІ КЕЗЕНДЕГІ ҚАРҚЫНДЫ ТЕРАПИЯНЫҢ НЕГІЗГІ ЭЛЕМЕНТИ**

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**Озектілігі:** Гепатопанкреатодуоденальды аймақтың қатерлі ісіктерінен туындағының асқынудардың тиімді қарқынды терапиясы өзекті мөселе болын қала береді. Ол энергия тапшылығын жоюға, дене салмагын қалпына келтіруге және ауыр гиперкетаболизмнің нәтижесінде бұзылған пластикалық процесстерді қалыпта келтіруге, ағзаның қоректік заттарға қажеттілігін артыруға және интоксикация синдромын дамытуға бағытталған, әсіресе операциядан кейінгі кезеңде.

**Мәқсаты:** Операциядан кейінгі ерте кезеңде гепатопанкреатодуоденальды аймақтың ісіктегі бар науқастарда тамақтануды қамтамасыз етудің негізгі аспектілерін зерттеу.

**Әдістері:** Зерттеу гепатопанкреатодуоденальды аймақтың қатерлі ісіктегі бар 18 жастан асқан 91 науқаста жүргізілді. Науқастар тағамдық қолдау түріне байланысты үш топқа болінді. Зерттеу скрининг нәтижелерін, дөне салмагының индексін, базальды метаболизм жылдамдығын және негізгі зертханалық корсеткіштерді қоса алғанда, тамақтану күйінің корсеткіштерін бағалады: қандагы лимфоциттердің деңгейі, жалты ақуыз, жалты билирубин және ALT және AST белсенелілігі.

**Нәтижелері:** Қолданылған скринингтік хаттамаларга сәйкес парентеральді тамақтануды қолдау кезінде 10-12-ші күндері 17 науқаста «қалыпты» тамақтану күйі сақталды, 14 науқаста 1 науқаста (3,2%) «ауыр жеткіліксіз тамақтану» регрессиясымен «ортша тамақтанбау» болды. Арасында тамақтануды тобында операциядан кейінгі кезеңнің 10-12-ші күндерінде белгілердің толық жойылуымен SGA және NRI шкалалары бойынша «ортша тамақтанбауы» бар науқастардың сәйкесінше 10% және 6,7% артуы байқалды. Берілген тамақтануды бағалау шкаласында сәйкес «ауыр жеткіліксіз тамақтану» ( $p < 0,005$ ).

**Қорытынды:** Оқишауланған парентеральді тамақтану тобында пациенттердің тамақтануды жағдайын түрақтандыру және сақтауда жеткілікті тиімділікке қол жеткізілді, бұл «ортша» және «қалыпты» тамақтану жағдайы бар пациенттер санының осуімен көрінді, сондай-ақ ауыр және орташа тамақтану тапшылығы бар науқастар санының төмендеуі.

Тамақтануды қолдаудың арасында түрі, оз кезегінде, парентеральды тамақтанудың перспективті баламасы ретінде қарастырылуы мүмкін, ойткени осы топтагы пациенттердің тамақтану жағдайының корсеткіштері парентеральды терапия нәтижелеріне статистикалық түрде үқсас болды.

**Түйінің сөздері:** тамақтану жағдайы, тағамдық жетіспеушілік, тағамдық қамтамасыз ету, жұтуу, онкология, тамақтану, гепатопанкреатодуоденальды аймақтың ісіктегі.

## АННОТАЦИЯ

### НУТРИЦИОННАЯ ПОДДЕРЖКА ПАЦИЕНТОВ С ОПУХОЛЯМИ ГЕПАТОПАНКРЕАТОДУОДЕНАЛЬНОЙ ЗОНЫ: КЛЮЧЕВОЙ ЭЛЕМЕНТ ИНТЕНСИВНОЙ ТЕРАПИИ В ПОСЛЕОПЕРАЦИОННОМ ПЕРИОДЕ

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**Актуальность:** Эффективная интенсивная терапия осложнений, возникающих при злокачественных новообразованиях гепатопанкреатодуоденальной области, остается актуальной задачей. Она направлена на устранение энергодефицита, восстановление массы тела и нормализацию пластических процессов, которые нарушаются в результате выраженного гиперкатаболизма, повышенных потребностей организма в питательных веществах и развития интоксикационного синдрома, особенно в послеоперационном периоде.

**Цель исследования** – улучшение нутриционного статуса онкологических больных после операций на гепатопанкреатодуоденальной зоне за счёт изучения и сравнения эффективности изолированной энтеральной, парентеральной и смешанной нутриционной терапии в ранний послеоперационный период.

**Методы:** В исследовании участвовал 91 пациент старше 18 лет с злокачественными опухолями гепатопанкреатодуоденальной зоны. Пациенты были разделены на три группы в зависимости от типа нутриционной поддержки. В рамках исследования была проведена оценка показателей нутриционного статуса, включая результаты скрининга, индекс массы тела, величину основного обмена, а также ключевые лабораторные показатели: уровень лимфоцитов в крови, общего белка, общего билирубина, а также активности АлАТ и АсАТ.

**Результаты:** При парентеральной нутриционной поддержке согласно используемым скрининг-протоколам к 10-12 суткам 17 пациентов сохраняли «нормальный» нутриционный статус, 14 пациентов – «умеренное недоедание» при регрессе «тяжелого недоедания» у 1 пациента (3,2%). В группе смешанного питания к 10-12 суткам послеоперационного периода наблюдалось увеличение числа пациентов со статусом «умеренное недоедание» по шкалам SGA и NRI на 10% и 6,7%, соответственно, при полной ликвидации признаков «тяжелого недоедания» по указанным шкалам ( $p < 0,005$ ).

**Заключение:** В группе с изолированным парентеральным питанием была достигнута достаточная эффективность в стабилизации и поддержании нутриционного статуса пациентов, что проявилось в увеличении числа пациентов с «умеренным» и «нормальным» нутриционным статусом, а также сокращении количества больных с тяжелой и умеренной нутриционной недостаточностью. Смешанный тип нутриционной поддержки, в свою очередь, может рассматриваться как перспективная альтернатива парентеральному питанию, поскольку показатели нутриционного статуса пациентов, достигнутые в данной группе, оказались статистически схожими с результатами парентеральной терапии.

**Ключевые слова:** пищевой статус, нутриционная недостаточность, нутриционная поддержка, онкология, питание, опухоли гепатопанкреатодуоденальной зоны.

**Transparency of the study:** The authors take full responsibility for the content of this manuscript.

**Conflict of Interests:** The authors declare no conflict of interests.

**Funding:** The authors declare no funding for the study.

**Authors Contribution:** conceptualization – E.R. Tashmetov; project administration – S.V. Plyassovskaya; investigation, validation, writing – original draft preparation – Sh.K. Davanov.

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