



STATE OF ENZYMES OF CAVITY, MEMBRANE DIGESTION. ABSORPTION OF CARBOHYDRATES IN PATIENTS WITH COMPLICATED GASTRODUODENAL ULCERS BLEEDING.

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Abstract:

In parallel with clinical, anamnestic and instrumental studies, to study the functional state of the digestive-transport conveyor of the SI, by simultaneously determining the activity of enzymes involved in cavity, membrane hydrolysis and absorption of carbohydrates in patients with gastroduodenal bleeding (GDB) of varying severity.

Keywords: Gastric ulcer, gastroduodenal bleeding, duodenal ulcer, pancreas, small intestine, digestive transport conveyor

INTRODUCTION.

In recent years, the frequency of ulcerative gastroduodenal bleeding (UGDB) has been increasing among the population. At the same time, the severity of a patient's condition with ulcerative hypertension is determined by the intensity and volume of blood loss, the age of the patients, and the presence of concomitant diseases [18]. Despite the successes of conservative, endoscopic and surgical treatment (the use of H2 blockers, proton pump inhibitors, anti-Helicobacter drugs, laser therapy, etc.), the number of patients with complicated peptic ulcer disease has not decreased over the past decades. Healed ulcers recur in 60-90% of patients, and in 50-60% complications such as bleeding, perforation and stenosis develop [7,14,15]. Advances achieved in the conservative treatment of peptic ulcer disease have led to a reduction in the number of surgical interventions for this pathology. However, such a serious complication as gastrointestinal bleeding accounts for 15-25% [3,6,16]. Ultimately, the problem of treating this group of patients cannot be considered completely resolved, since there is no single generally accepted tactic.

An analysis of the publications of most authors and the results of clinical and instrumental studies we obtained allow us to assert that peptic ulcer of the stomach and duodenum (duodenum), both independent diseases and various types of complications, as well as operations on the stomach, are associated with a violation functions of the digestive system organs [8,9,10,11], which significantly affects the course of the disease itself with sharp changes in clinical symptoms and the results of its surgical treatment. Despite the localization of the ulcerative

process or the presence of disease of the operated stomach, the observed symptom complex in many patients includes enteral syndrome, reflecting damage to the small intestine (SB) and the development of severe digestive and transport disorders [5,8,12,13, 19,20,21]. However, it must be noted that these disorders have so far remained without due attention; at best, they are regarded as features of the symptoms of a peptic ulcer or a disease of the operated stomach. Perhaps the concept of "hard-to-heal ulcers" was formed due to the functional insufficiency of the digestive organs. Therefore, the final solution to the treatment of patients with duodenal ulcer (DU) should include treatment of diseases of the accompanying digestive organs (liver, pancreas (P) and small intestine (S)).

Advances in the field of physiology and pathology of the digestive organs and, especially, after the discovery of membrane digestion by Academician A. M. Ugolev require mandatory consideration of the state of the digestive transport conveyor (DTC) as a whole and its individual links in this pathology. Therefore, in parallel with the general clinical examination of patients, we examined the exocrine (amylolytic) function of the pancreas, the hydrolytic and transport functions of the small intestine, which characterize the state of cavity, membrane digestion and absorption of carbohydrates.

MATERIALS AND METHODS:

A prospective analysis of the treatment results of 1792 patients who were treated at the Department of Surgical Diseases of the Medical Academy at the base of the 1st city clinical hospital for gastric and duodenal ulcers was carried out. Of these, 1241 patients were treated with complicated bleeding, in 138 cases the bleeding was not of ulcerative etiology, in 299 cases there were



chronic peptic ulcers and duodenal ulcers. Only 98 patients were operated on for stenosis. 114 patients were operated on for perforation. The study included all patients whose source of hemorrhage was a defect in the wall of the stomach or duodenum with a diameter of 0.5 to 3 cm and depth to the submucosal and muscular layers, having a smooth bottom, roll-like, dense and smooth edges, undermined in the proximal direction and flat in the distal direction.

Patients with a history of ulcerative ulcers and duodenal ulcers were diagnosed for the first time in 216 (17.4%) cases, ulcerative history was up to 1 year in 496 (39.9%), 1-3 years in 130 (10.5%), 3-5 years – in 98 (7.9%), 5-10 years – in 139 (11.2%), more than 10 years – in 162 (13.1%) patients. Most patients suffered from peptic ulcer within one year. In all patients, the course of the disease was quite typical: 2-3 hours before the onset of bleeding, pain in the epigastric region intensified, especially at night, the pain was persistent (in 583 patients), which subsided after the onset of bleeding. They felt a general weakness of an increasing nature (601 patients), accompanied by dizziness (305 patients), nausea (313 patients), vomiting of the "coffee grounds" type (1073 patients) and dark blood (39 patients). After 8-12 hours from the moment the abdominal pain subsided, tar-like stools were observed (511 patients). During examination in the emergency room, 874 patients had stool that was tarry, which indicated the presence of bleeding from the upper gastrointestinal tract. For the first time, peptic ulcer disease was complicated by bleeding in 679 patients, in 487 patients bleeding recurred, and in 78 patients bleeding was observed repeatedly. The time period from the onset of bleeding to admission to the clinic varies widely - from 2 hours to 2 weeks.

Analysis of the degree of bleeding in 1241 patients showed that 388 (31.3%) patients had grade I blood loss, 594 (47.9%) had grade II, and 258 (20.8%) patients had grade III blood loss.

The size of the ulcer in 285 patients was up to 0.5 cm, in 793 - up to 1.0 cm, in 103 - 1-2.0 cm, in 60 - more than 2.0 cm.

In 125 (10.1%) patients, gastroduodenal ulcer was combined with stone cholecystitis, and in 87 (7.03%) peptic ulcer disease was accompanied by chronic acalculous cholecystitis, pancreatitis and hepatitis, in 844 (68%) cases, ulcer bleeding was combined with varying severity anemia.

Statistical processing of the material was carried out using the method of nonparametric analysis with the calculation of the χ^2 criterion. The probability of 95% ($p < 0.05$) was taken as a numerical measure of the objective possibility of an event.

Of the 1241 patients, there were 932 men and 309 women. The ratio of men to women was 3.01:1. The vast majority of patients were men of working age.

Age of patients: (WHO classification, 2017) 18-44 was in 588 (47.38%), 45-59 in 353 (28.45%), 60-74 in 227 (18.3%), 75-90 - in 73 (5.9%). The anamnesis revealed that in 87 patients, peptic ulcer disease was previously complicated by bleeding; for this reason, they (with the exception of one) underwent surgery to suturing the bleeding vessel (39) or gastric resection (2). Another 114 people were operated on for perforated ulcers. The intensity of bleeding was determined according to the classification of Y. A. Forrest (1974):

Depending on the goal, patients are divided into two groups. Group 1, 27 patients with DU without any complications (control group). The age of patients is 20-60 years; 17 men and 10 women and group 2, 45 patients with duodenal

ulcer complicated by bleeding of varying severity before surgery (33 men and 12 women aged 20-80 years). In 15 patients the bleeding was mild, in 16 – moderate and in 14 – severe. All patients of both groups underwent special research methods to study the function of the digestive-transport conveyor of carbohydrates, through a simultaneous comprehensive study of the activity of digestive carbohydrates. It should be noted that a comprehensive study of digestive carbohydrates and absorption was carried out in the same patient at the same time:

The treatment tactics were based on the preference for endoscopic assistance, which was performed repeatedly, if necessary, to achieve final stoppage of bleeding. Against the background of primary hemostasis, complex drug treatment of peptic ulcer was mandatory, including H₂-receptor blockers (ranitidine - 300 mg per day, famotidine - 20-40 mg at night), proton pump inhibitors (omeprazole - 40-80 mg per day) and anti-Helicobacter eradication (metronidazole - 400 mg, amoxicillin - 1000 mg 2 times a day, clarithromycin - 500 mg) according to the traditional regimen [3,18]. Method of carbohydrate (food) loads. This method is based on the fact that all complex substances (polymers), when absorbed, go through three stages of digestion (cavitary, membrane digestion and absorption), oligomers - two stages (membrane digestion and absorption), and monomers - only suction stage. By determining the content of hydrolysis products of poly- and oligomers or individual monomers taken in metered quantities in the blood, urine or feces, one can make an indirect conclusion about the processes of cavity, membrane digestion and absorption.

Studies with carbohydrate loads, oral or intrajejunal route, were carried out in the morning on an empty stomach with an interval of 1 day [2,4]. In this case, the amount of carbo-



hydrates was used at the rate of 1 g per 1 kg of the patient's body weight and was dissolved in 200 ml of boiled distilled water. During the entire study, the patients fasted, being in a state of physiological rest. Blood was collected from the fingertip before and 15, 30, 60, 90 and 120 min after exercise. The level of glycemia was determined by the glucose oxidase method according to A. Dhalqvist [23] and expressed in mmol/l. Calculations were carried out using a calibration curve. The activity of carbohydrate hydrolysis was assessed by the nature of the resulting glycemic curve, where we were mainly interested in the percentage and maximum increase in glycemia within 30 minutes. At the same time, we proceeded from the position established by A. M. Ugolev [17] that an increase in glycemia in the first 15-30 minutes after the administration of carbohydrates (the ascending part of the glycemic curve) predominantly characterizes the state of the processes of membrane digestion and absorption, and the descending segment of this curve (60-, 90- and 120 min.) mainly characterizes the processes of assimilation and deposition of absorbed monomers. Therefore, we present only the results obtained at 30 min. after load. It should be noted that when using the carbohydrate loading technique, it is possible to diagnose selective or generalized damage to the mechanisms of one or another link of the digestive-transport conveyor. Test with starch. The processes of cavity hydrolysis and absorption of carbohydrates in the SI can be judged by the starch loading method, which is based on the fact that pancreatic α -amylase entering the SI is one of the main necessary enzymes in the assimilation of polysaccharides (starch) and carries out the initial stages of hydrolysis (cavitary digestion). The increase in glycemia after a starch load depends on the activity of pancreatic α -amylase and intestinal α -amylase, which determine the intermediate and final stages of starch hydrolysis and absorption of the resulting glucose.

Test with oligosaccharides. The processes of membrane hydrolysis and absorption of carbohydrates in SI can be judged by the load of maltose and sucrose. This test is the main indicator of the hydrolytic and transport capacity of enterocytes and, therefore, of intestinal enzymatic activity. An increase in the glycemic curve by 50-60% indicates that both the enzyme systems of SI and the processes of intestinal absorption are not impaired; an indicator below 35% indicates a violation of the enzymatic activity of SI and intestinal absorption [17].

Glucose test. The processes of true transport (absorption of monomers) of carbohydrates in the SI can be judged by the glucose load. The glucose tolerance test is considered the traditional measure of intestinal carbohydrate absorption. The test is based on the fact that glucose is easily dissolved, does not require enzymatic treatment for absorption and is directly transported through the membranes of enterocytes. An increase in glycemia after a glucose load indicates the rate of active transport of this monomer.

But the glucose test has some disadvantages, the most important of which is the dependence of the glycemic curve on certain organs and systems (for example, the liver, pancreas, central nervous system) that control the metabolism and deposition of absorbed glucose. Therefore, in each specific case, all possible factors affecting carbohydrate metabolism should be taken into account [19]. Therefore, to study the true transport function of MCs, we additionally used the loading method with D-xylose, which, as is known, is not metabolized [23, 24].

Test with D-xylose. D-xylose is a five-carbon carbohydrate (pentose) that is only to a small extent utilized (destroyed by intestinal bacteria) in the body. Normally, D-xylose is not present in the blood, is not phosphorylated during absorption, and most factors influencing glucose metabolism do not have a significant effect on the conversion of D-xylose in the body. Thanks to this, the drug is very convenient for studying the absorption activity of SI. To determine D-xylose in the blood, we used the orcin ultramicro-method according to M. Rosental, J. Tomaszewski [24], based on the fact that D-xylose is dehydrated with concentrated hydrochloric acid to form furfural. The latter gives a green color with orcin. The color intensity is proportional to the xylose content in the sample.

Intrajejunal method of carbohydrate loading. Oral administration of the drug cannot always be used in patients with complicated duodenal ulcers, especially with decompensated stenosis, post-vagotomy atony, gastrostasis, anastomosis, etc. Due to prolonged gastrostasis, orally administered carbohydrate will be retained in the stomach (or stump), and therefore it is impossible to obtain objective information about the state of absorption from the SI. Therefore, to create uniform conditions for studying the digestive function of SI, the staff of the Scientific Center for Surgery of the Republic of Uzbekistan [2] developed an intrainestinal method of carbohydrate loading. To do this, through the biopsy channel of the endoscope, a thin Teflon catheter is passed through the pyloric ring under visual control, while the injected substrate directly enters the lumen of the duodenum. This technique makes it possible to exclude the presence of the substrate in the stomach (or stump) and, thereby, creates the same conditions for research.

We slightly modified this method (improvement proposal No. 350, 2001): instead of a Teflon catheter, we used a radiopaque angiographic catheter (Schneider Europe AG, Sweden) with an internal diameter of 0.2 cm. During the initial diagnostic endoscopy of the patient, simultaneously through the biopsy the endoscope channel, under visual control, a 30 cm catheter is inserted behind the pyloric ring. In this case, the catheter directly enters the initial part of the jejunum, which is confirmed by x-ray. The advantage of the developed method is that the probe is inserted only once, during the initial endoscopy of the patient. At the same time, the catheter is easi-

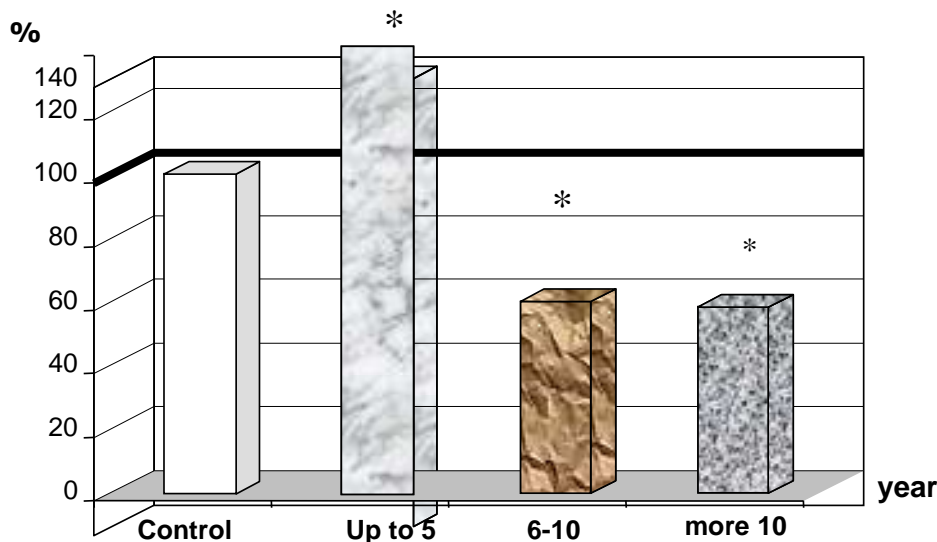


ly controlled and moves well through the endoscope, and during surgery it can be easily and unhindered pushed through the intestines without any difficulty. Most importantly, the catheter can remain in the lumen of the SI for a long time (up to 10 days) without causing irritation in the nasal cavity, esophagus, or SI; The patient has no unpleasant sensations during normal eating and exercise through the mouth. And this, in turn, makes it possible to conduct a full examination and correction of the digestive and transport function of the SI. Periodically, using fluoroscopy, you can monitor the location of the probe in the intestine. It should be noted that intrajejunal administration of carbohydrates causes a more significant increase in glycemic levels compared to oral administration. This fact in itself seems interesting both from the point of view of diagnosing the functional capacity of the

small intestine, and determining the severity of disturbances in the evacuation activity of the stomach in case of complicated duodenal ulcer and its surgical treatment, as well as in organizing adequate pre-operative preparation and postoperative management sick.

Uncomplicated duodenal ulcer

The digestive transport system was studied in 27 patients with peptic ulcer without any complications. The age of patients is 20-60 years; 17 men and 10 women. Studies have shown that there is a certain relationship between the duration of ulcerative disease and the activity of pancreatic α -amylase in the duodenal cavity (pic. 1): with an ulcer history up to 5 years, it exceeds the norm by 40%, and over 5 years – significantly reduced from the norm.



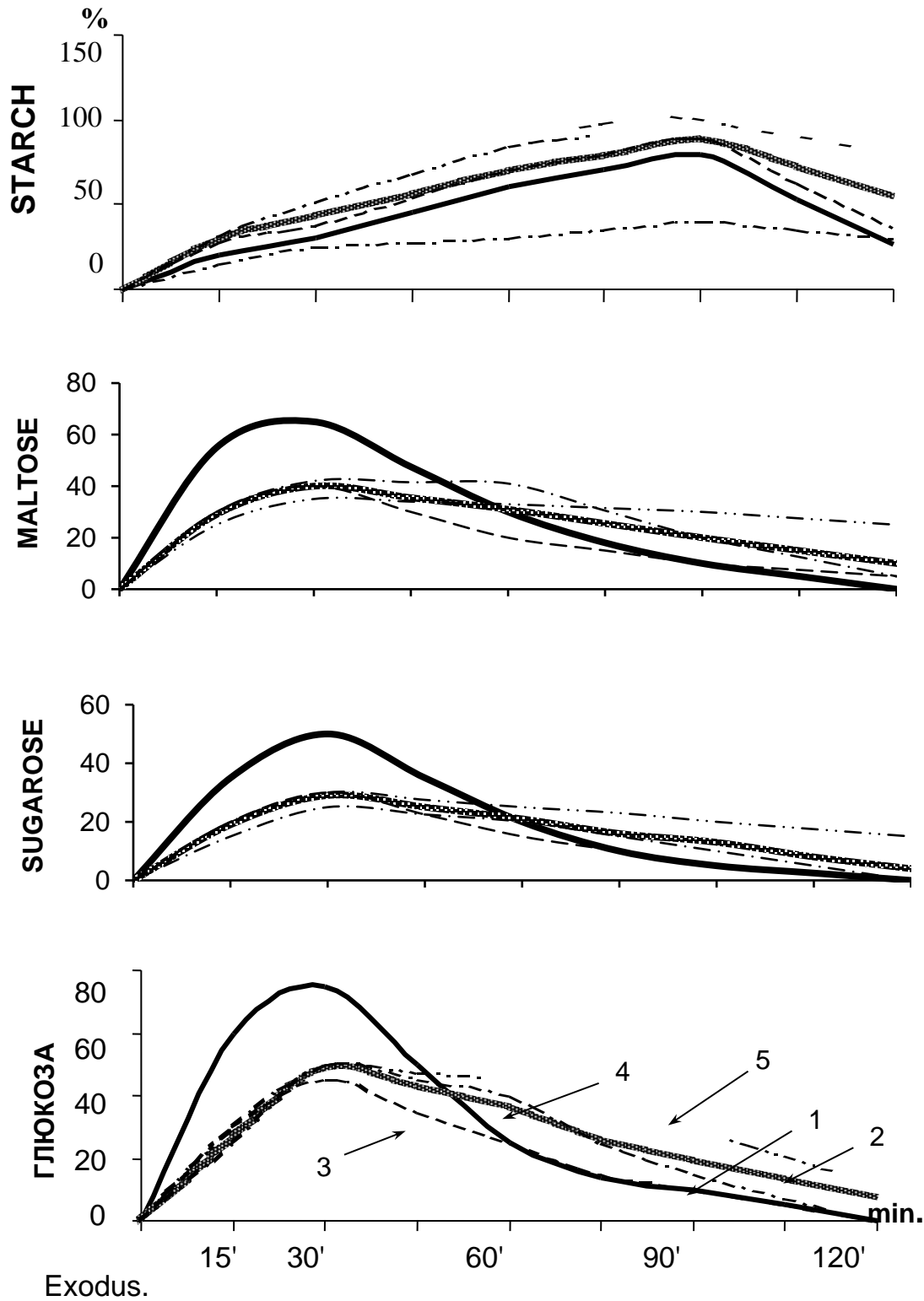
Pic.1. The activity of pancreatic α -amylase (in%) in the contents of the duodenum in healthy individuals (control) is a white bar and, depending on the duration of the disease, colored bars.

* – significant difference from control ($P < 0.05$), taken as 100%

Approximately the same dynamics of shifts are observed when analyzing data on the glycemic response to starch load (pic. 2).

Our studies showed that the majority of patients had a very clear picture of shifts in the ascending part of the glycemic curve (15, 30 minutes) after loading with starch solution (Table 1), and in some cases there were shifts at the level of the descending part parts of the glycemic curve.

Patients with uncomplicated peptic ulcer already for 15 min. responded to oral administration of starch by increasing blood glucose levels; its maximum increase occurred at 90 minutes. after the load, and then to 120 min. – there was a slight decrease in glucose levels. This decrease was quite high in 16 (60%) patients, slightly less in 6 (20%), and in the remaining 5 (20%) patients the glycemic curve was paradiabetic in nature. To confirm the data obtained, we provide clinical examples.





Pic.2. Increase in glycemic level over time 120 min. after an oral carbohydrate load in healthy (1) and patients with uncomplicated peptic ulcer (2).

Note. Clinical examples of glycemic curve variants (dashed lines) after oral administration of various carbohydrates to patients Sh.A.V. (3), K.D. (4) and T.B. (5).

Table 1.

An increase in the level of glycemia after oral carbohydrate loads in healthy individuals (control) and in patients with uncomplicated peptic ulcer over time for 120 min.

(M ± m), mmol/l.

Group	Time elapsed after load, min.					
	Exodus	15	30	60	90	120
LOADING WITH STARCH SOLUTION						
Control (n=35)	0	1,00± 0,06	1,50±0,09	3,00±0,20	4,00±0,20	1,30±0,07
Uncomplicated. Duodenal ulcer (n=27)	0	1,50±0,08*	2,20±0,11*	3,50±0,18 *	4,30±0,22*	2,80±0,14*
LOADING WITH MALTOSE SOLUTION						
Control	0	2,90±0.15	3,40±0.20	1,60±0.09	0,50±0.03	0
Uncomplicated. Duodenal ulcer	0	1,40±0.07*	1,90±0.11*	1,50±0.08	1,00±0.06*	0,50±0.03*
LOADING WITH SUCHAROSE SOLUTION						
Control	0	1,80±0.10	2,50±0.15	1,00±0.06	0,30±0.02	0
Uncomplicated. Duodenal ulcer	0	0,90±0.05*	1,40±0.08*	1,00±0.05	0,60±0.04*	0,20±0.01*
LOADING WITH GLUCOSE SOLUTION						
Control	0	3,00±0.15	3,80±0.25	1,30±0.07	0,50±0.03	0
Uncomplicated. Duodenal ulcer	0	1,40±0.08*	2,50±0.15*	1,90±0.10*	1,00±0.06*	0,40±0.02*

Примечание. * – достоверное отличие от контроля – P < 0,05.

Thus, the activity of pancreatic α-amylase in the duodenal contents in patients with uncomplicated peptic ulcer is significantly increased. Accordingly, the increase in glycemia after oral administration of starch is also significantly increased. Consequently, in patients with uncomplicated pep-

tic ulcer (5 years ago), the rate of the initial stage of polysaccharide hydrolysis is increased.

When studying the state of membrane hydrolysis of carbohydrates, tested in patients by the increase in glycemia after loads with maltose, it was found that in the vast majority of patients the maximum increase in blood glucose was 29 and



40%, respectively, for 15-30 minutes, and after the load sucrose – 19 and 29% also for 15-30 minutes. However, the descending part of the curve after both loads, as in the case of the starch load, differed among patients (Table 1, Fig. 2).

Thus, if in 15 (55.6%) of 27 patients, at 60 minutes after the maltose load, the glycemic level dropped quite sharply and returned to the initial level at 120 minutes, then in 7 (25.9%) patients the descending part of the glycemic curve started only at 90 minutes. after the load, and in the remaining 5 (18.5%) patients the glycemic curve after the load was paradiabetic in nature.

After a sucrose load in 18 (66.7%) patients, the maximum increase in blood glucose levels after a sucrose load occurred at 30 minutes. with a further rather rapid decrease to the initial level; in 5 (18.5%) - the peak time of glycemia was also 30 minutes, but the rate of further decrease in sugar levels was somewhat slower; in 4 (14.8%) the glycemic curve somewhat resembled the paradiabetic curve. It should be noted that the deviation of glycemic data from the usual in some patients can in no way affect the conclusion about the inhibition of the hydrolytic-transport function of SI in uncomplicated duodenal ulcers.

Thus, with uncomplicated peptic ulcer, the level of glucose absorption from solutions of maltose and sucrose is significantly reduced compared to healthy individuals, which indicates a decrease in the function of membrane hydrolysis and transport, which is realized with the participation of the intestinal enzymes maltase and sucrase and associated transporters .

The results of studies to determine the actual transport function of SI in uncomplicated DU, i.e. The level of glycemia after a glucose load showed a natural decrease in all

patients. This decrease (49%) occurred at 30 minutes. after load. However, in the future, the nature of the glycemic curve in some patients varied slightly: in 7, the increased glucose level after exercise decreased somewhat more slowly, and in 3, we observed a paradiabetic curve. However, the analysis showed that the glycemic level at 15 and 30 minutes. after a glucose load in patients with uncomplicated peptic ulcer, it is always lower than in healthy people, in whom the glucose level increases by 30 minutes. was 75%. Oral administration of D-xylose showed an increase in its concentration in the blood already at 15 minutes, reaching a maximum at 30 minutes, then it rapidly decreased, reaching almost the initial level at 120 minutes. However, the level of increase in the concentration of this pentose was significantly lower than in healthy people, which also confirms the conclusion that the absorption of monosaccharides in SI is impaired. The results of studies with differential determination of the increase in glycemic levels in the same patients after oral and intrajejunal administration of carbohydrates are shown in Table 2. and in pic.3.

With both methods of introducing loads, the maximum increase in glycemia occurred at 15 and 30 minutes. with a further gradual decrease in glycemic levels for 60-120 minutes. In some cases, a deviation from this pattern was observed - a shift in the maximum glycemic level by 60 minutes. after the load with a further rather slow decrease to 120 min. After starch loading, the maximum increase in blood glucose occurred at 60 and 90 minutes. with a further gradual decrease in it in subsequent periods of the study (120 min.). In this case, a shift in the maximum glycemic level in the later periods after exercise was also observed.

Table 2.

Differential characteristics of various methods of introducing carbohydrate loads in patients with uncomplicated duodenal ulcer (M ± m), mmol/l.

Carbohydrates	Carbohydrate loading methods			
	Oral		Intraintestinal	
	Time elapsed after exercise, min.			
	15	30	15	30
Starch	1,50 ± 0,08	2,20 ± 0,11	1,70 ± 0,09	2,30 ± 0,12
Maltose	1,4 0 ± 0,07	1,90 ± 0,11	1,60 ± 0,08	2,00 ± 0,12
Sucrose	0,9 0 ± 0,05	1,40 ± 0,08	1,00 ± 0,07	1,60 ± 0,08
Glucose	1,4 0 ± 0,08	2,50 ± 0,15	1,50 ± 0,08	2,70 ± 0,14



-xylose	0,26 ± 0,01	0,65 ± 0,03	0,30 ± 0,02	0,69 ± 0,04
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Thus, with uncomplicated DU, the

Not only the enzyme-producing system of enterocytes, but also the function of hydrolytic transport ensembles (such as maltase and sucrase transport complexes) undergo certain changes.

Bleeding from gastric and duodenal ulcers

Profuse bleeding from gastric and duodenal ulcers, accompanied by high overall (15-25%) and postoperative (20-30%) mortality, represent one of the most difficult problems of modern surgery.

The state of cavity, membrane digestion and absorption of carbohydrates was studied in 45 patients with duodenal ulcer complicated by bleeding of varying severity before surgery (33 men and 12 women aged 20-80 years). In 15 patients the bleeding was mild, in 16 – moderate and in 14 – severe.

All studies were carried out only on the second day - after the bleeding from the ulcer had completely stopped. In patients for whom conservative therapy was ineffective, emergency surgical intervention was performed according to indications. The criterion for stopping bleeding was stable hemodynamics, red blood counts, conclusion, general condition of the patient, pulse, blood pressure, endoscopic signs of stopping bleeding and other indicators.

It was previously shown that there are quite sharp individual fluctuations in the parameters we studied (amylolytic activity of duodenal contents, absorption of various carbohydrates from solutions). However, in relation to many indicators, it is still possible to find the unidirectionality of their shifts. To illustrate this, here are some clinical examples.

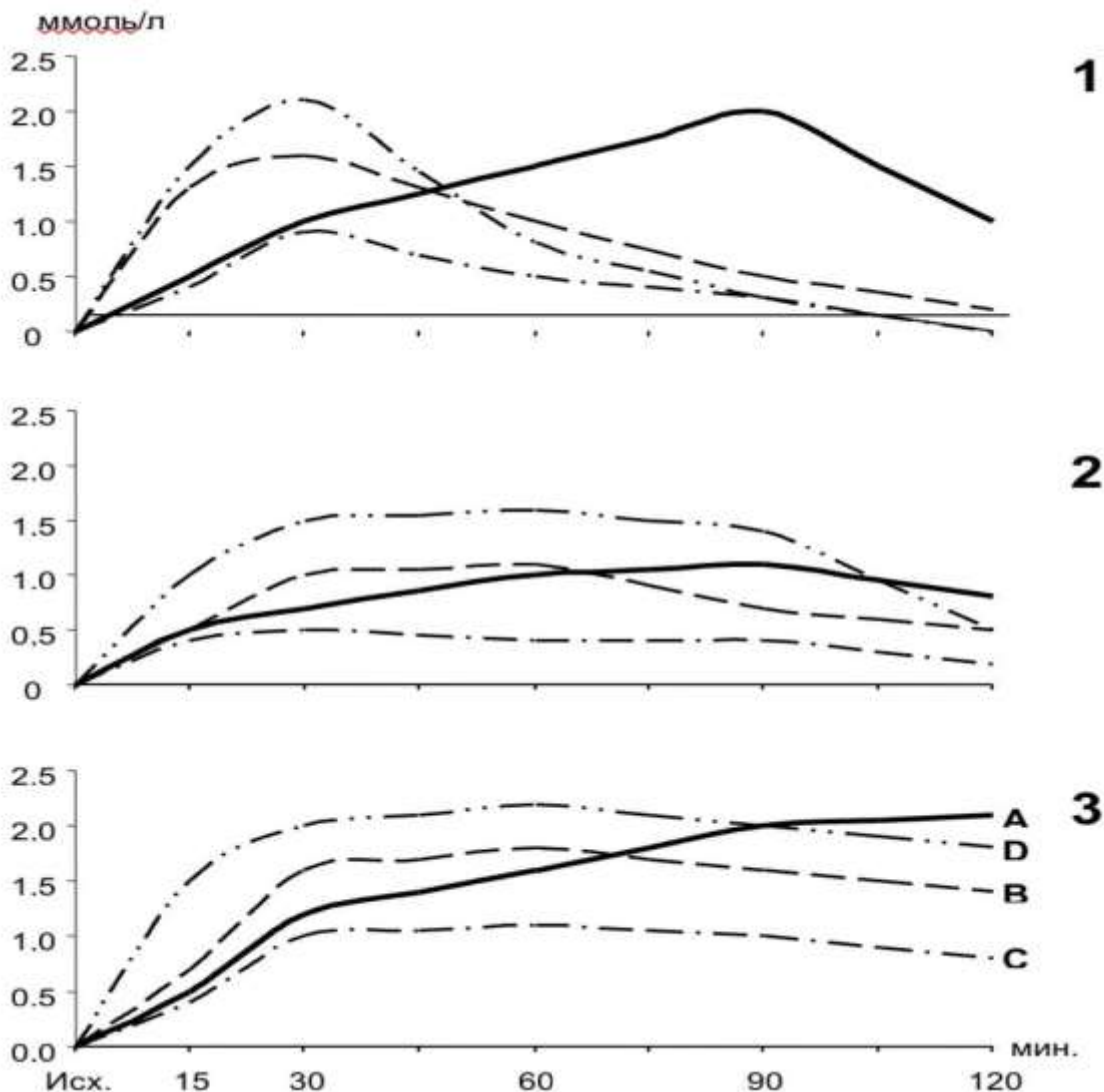




Рис.4. Прирост уровня гликемии после пероральной нагрузки раствором крахмала (А), мальтозы (В), сахарозы (С) и глюкозы (D) у больных: дуоденальной язвой, осложненной кровотечением средней степени тяжести: К.М.К. (1), А.Ш.У. (2), Р.Б.Р. (3).

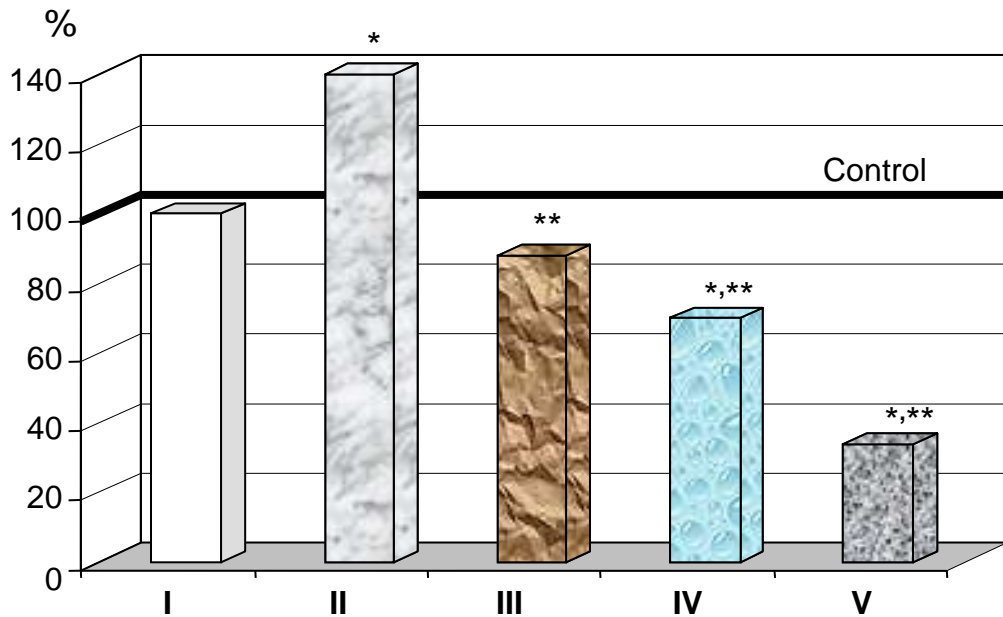
Pic.3. The increase in the level of D-xylose in the blood over time after its oral load in healthy individuals (I) and patients with uncomplicated duodenal ulcer (IIa), as well as after intrajejunal administration to the same patients (IIc).

Observation 4.4. Patient K.M.K., 58 years old (case history No. 1185), was admitted to the hospital on 02.24.98. with complaints of general weakness, dizziness, moderate pain in the epigastric region, nausea, vomiting three times in the form of coffee grounds, and the presence of black stools. According to the patient, she had been experiencing pain in the epigastric region for 12 days. Three days before contacting us, the above complaints appeared. Repeated endoscopy dated 02/26/98: Chronic mirror ulcers of the upper (0.2 x 0.8 cm) and lower (0.8 x 0.6 cm) walls of the exit section of the duodenal bulb, complicated by bleeding and with a fixed blood clot. Erosive antrum gastritis. R• -scopy of the gastrointestinal tract dated March 1, 1998: Chronic duodenal ulcer. Ultrasound from 03/05/98: Chronic cholecystitis. General blood test dated 02.24.98: Hb-80, Er.-2.5, CP-0.85, L-9.8, PTI-80, Ht-29. After oral carbohydrate loads with solutions of starch, maltose, sucrose, glucose and D-xylose, a normoglycemic type of glycemic curve was revealed, where the maximum increase in glycemia occurred at 30 minutes, amounting to 40% of the initial level and a rapid decrease by the end of the study (120 min.) to the initial level (pic. 4.1).

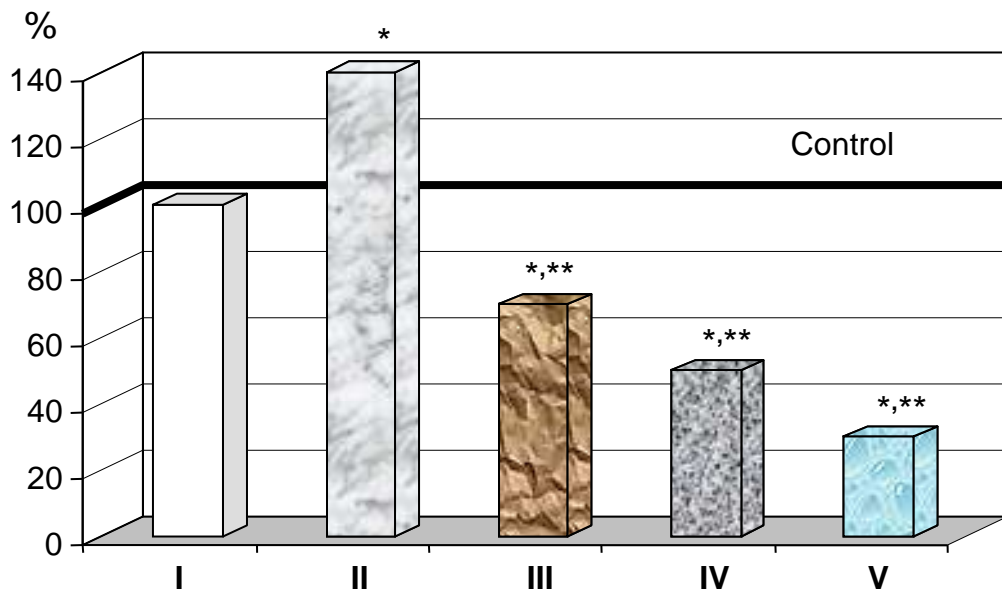
Observation 4.5. Patient A. Sh. U., 37 years old (case history No. 9839), was admitted to the hospital on December 29, 1997 with complaints of general weakness, dizziness, nausea, vomiting mixed with blood, and the presence of black stools. According to the patient, he has been suffering from duodenal ulcer for 6 years. The above complaints appeared this morning. Before this, for 20 days, I had been experiencing pain in the epigastric area. EGDFS dated December 29, 1997: Chronic ulcer (1.0 cm) of the anterior inferior duodenal bulb with signs of stopped bleeding. Severe scar-ulcerative deformation of the pylorus, complicated by inflammatory stenosis. Severe gastritis, NFC, erosive reflux

esophagitis. R• -scopy of the gastrointestinal tract dated January 6, 1998: Chronic duodenal ulcer. Ultrasound scan dated January 5, 1998: Chronic hepatitis, chronic cholecystitis. General blood test dated December 29, 1997: Hb-77, Er.-2.8, CP-0.8, L-7.2, PTI-71, Ht-24. After oral carbohydrate loads with solutions of starch, maltose, sucrose, glucose and D-xylose, a flat type of glycemic curve was revealed, where the maximum increase in glycemia occurred at 30 minutes, accounting for 19% of the initial level and remained at this level until the end of the study (pic. 4.2).

Observation 4.6. Patient R. B. R., 48 years old (case history No. 1697), was admitted to the hospital on March 13, 1999 with complaints of general weakness, dizziness, nausea, vomiting with blood in the form of coffee grounds. According to the patient, pain in the epigastric region began 4 days ago. Today around 6• in the morning the above complaints appeared. He doesn't connect his illness with anything. This is the first time such an incident has occurred. There is no history of ulcers. Repeated endoscopy dated March 16, 1999: Chronic ulcer (0.6x0.8 cm) of the lower wall of the exit section of the duodenal bulb. Erosive bulbitis. Moderate cicatricial and ulcerative deformation of the pylorus and the walls of the duodenal bulb. Signs of stopped bleeding. R• -scopy of the gastrointestinal tract from 03/31/99: Chronic duodenal ulcer. Ultrasound from 03.25.99: Chronic hepatitis, chronic cholecystitis, chronic pancreatitis. General blood test dated March 15, 1999. Nv-80, Er.-2.6, TsP-0.8, L-4.0, PTI-90, Nt-25. After oral carbohydrate loads with solutions of starch, maltose, sucrose, glucose and D-xylose, a paradiabetic type of glycemic curve was revealed, where the maximum increase in glycemia occurred at 30 minutes, amounting to 40% of the initial level and remained at this level until the end of the study (Pic 4., 3).



A The activity of pancreatic α -amylase in the contents of the duodenum in patients with duodenal ulcer complicated by bleeding: III - mild, IV - moderate and V - severe.



B Activity of pancreatic α -amylase in the contents of the duodenum in patients with duodenal ulcer complicated by stenosis: III - compensated, IV - subcompensated and V - decompensated stenosis.

Pic. 5. Activity of pancreatic α -amylase in the contents of the duodenum: I - in healthy individuals; II - for duodenal ulcer. A - for duodenal ulcer complicated by bleeding: III - mild, IV - moderate, V - severe. B - for duodenal ulcer complicated by stenosis: III - compensated, IV - subcompensated, V - decompensated.

* - significant difference from healthy individuals; ** - from an uncomplicated duodenal ulcer.



A study of the activity of pancreatic α -amylase in the contents of the duodenum on the 2nd day after persistent stopping of bleeding of varying degrees of severity showed (pic. 5, A) that with mild degrees of blood loss, β -amylolytic activity is not significantly reduced from the control (by 17%), with a moderate degree, this decrease becomes significant (by 36%), and with a severe degree, this decrease becomes more pronounced (by 70%).

Simultaneously with the change in enzyme activity in the initial stage of carbohydrate hydrolysis, the transport and hydrolytic-transport function of SI changes. This is confirmed by a change in the magnitude of the increase in glycemia after starch, maltose, sucrose and glucose loads (Table 3).

Table 3.
Increase in glycemic level for 30 minutes. after an oral carbohydrate load in patients with DU complicated by bleeding ($M \pm m$), mmol/l.

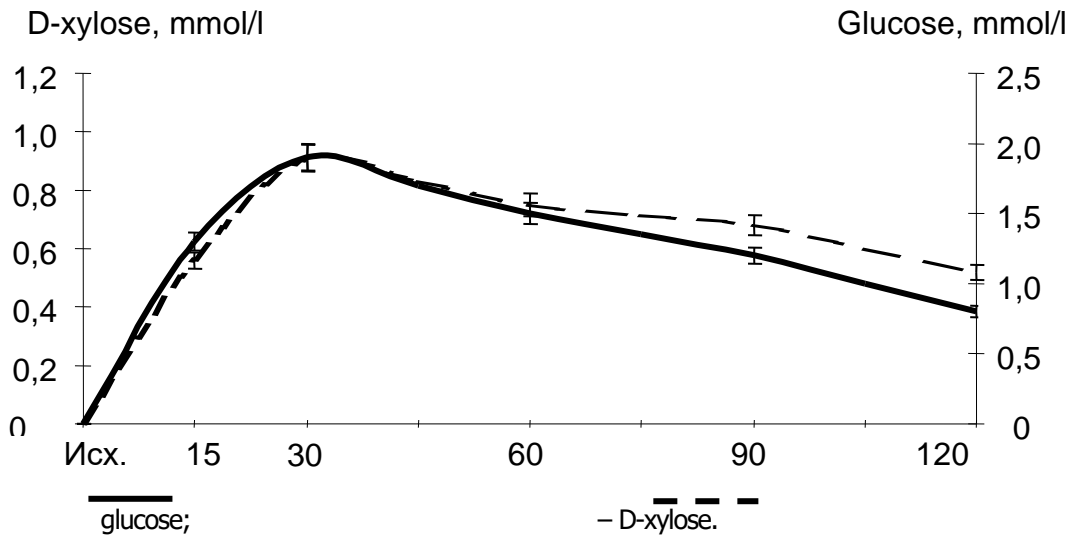
Group	Carbohydrate loads			
	starch	maltose	sucrose	glucose
Duodenal ulcer without complications	2,20 ± 0,11	1,90 ± 0,10	1,40 ± 0,08	2,50 ± 0,13
Duodenal ulcer, complicated. bleeding, degree: - light - average - heavy	1,90 ± 0,10	1,80 ± 0,09	1,30 ± 0,07	2,30 ± 0,12
	1,00 ± 0,07 *	1,60 ± 0,07 *	0,90 ± 0,06 *	2,10 ± 0,10
	0,40 ± 0,03 *	0,60 ± 0,03 *	0,50 ± 0,03 *	0,90 ± 0,05 *

Note. * – significant difference from uncomplicated peptic ulcer.

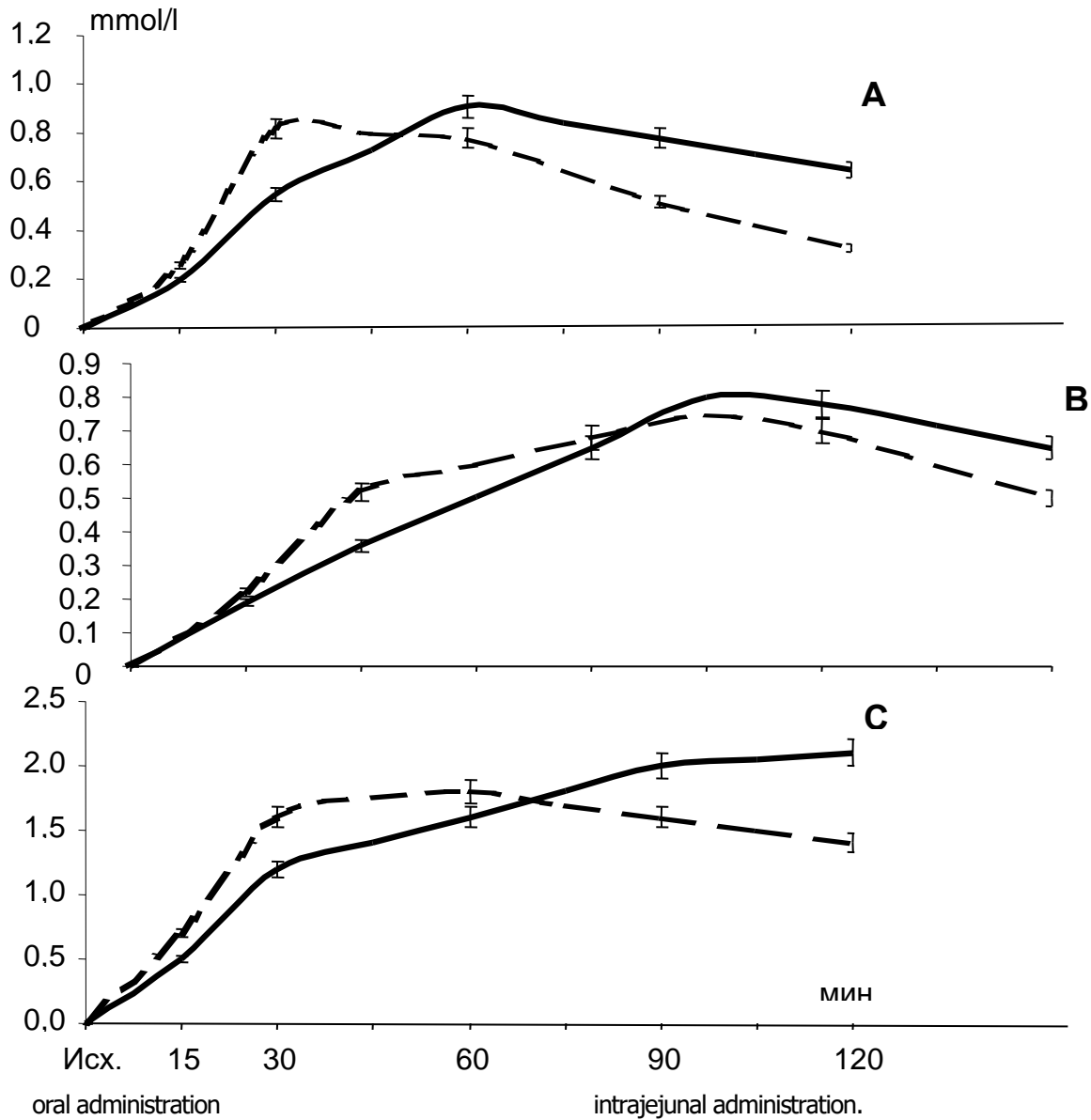
Indicators of glycemic levels after a carbohydrate load in patients with duodenal ulcer complicated by mild bleeding did not change compared to indicators of uncomplicated peptic ulcer. With an average degree of bleeding, this indicator does not change after glucose and maltose loads, but after starch and sucrose loads it significantly decreases (by 55 and 36%, respectively). With severe bleeding, there is a clear damage to all three parts of the digestive transport conveyor: the absorption of glucose from solutions of all types of carbohydrates decreased to a more pronounced extent (by 82; 68; 64 and 64%, respectively).

With a D-xylose load, almost the same results were obtained as with glucose (Fig. 6). When comparing the level of

increase in D-xylose in the blood with oral and intrajejunal load in patients with varying degrees of severity bleeding (Pic. 7), it was found that with mild bleeding, a clearly defined difference in the nature of the curve is visible depending on the method of administration of D-xylose - directly into the intestines or through the stomach. The same pattern of D-xylose concentration in the blood remains with moderate bleeding, however, a more significant decrease in the curve is observed after intrajejunal administration of D-xylose, which indicates the state of the excretory function of the kidneys. In severe bleeding, the concentration of D-xylose in the blood after exercise remains exactly the same after both methods of introducing it into the gastrointestinal tract.



Pic.6 Indicators of glucose and D-xylose levels in the blood over 120 min. after an oral load in patients with duodenal ulcer complicated by moderate bleeding.



Pic.7. Concentration of D-xylose in the blood after oral and intrajejunal administration in patients with duodenal ulcer complicated by mild (A), moderate (B) and severe (C) bleeding.

Thus, the data obtained allow us to conclude that impaired hydrolysis and absorption of carbohydrates is one of the causes of enteric syndrome when this pathology is complicated by bleeding.

CONCLUSION

In uncomplicated gastroduodenal ulcer (GDU), membrane digestion is suppressed, in contrast to the activity of pancreatic α -amylase (cavitory digestion), which increased under these conditions. As for the actual transport function (absorption) of the SI, it decreases. This is evidenced by studies

with glucose and D-xylose loads. Gastroduodenal ulcer (GDU), complicated by bleeding, significantly disrupts intestinal digestion. The severity of this disorder depends on the link of the digestive-transport conveyor being studied and the volume of blood loss. -amylolytic activity in the contents of the duodenum is slightly reduced with mild degrees of blood loss, somewhat more so with moderate degrees, and more pronounced with severe ones.

The absorption of glucose from starch solution does not change with mild degrees of blood loss, but decreases with moderate and more significantly with severe degrees.



A similar picture of impaired glucose absorption can be observed during exercise with solutions of oligo- and monosaccharides.

REFERENCE.

1. Abdullaev N.Kh. Interorgan and intersystem relationships in diseases of nonspecific nature. – Tashkent, 1990. – 170 p.
2. Ametov L.Z., Kalish Yu.I., Kim N.P. Assessment of absorption results in the test with D-xylose in patients with complicated forms of duodenal ulcer // Med. magazine Uzbekistan. – 1982. – No. 8. – P.20-23.
3. Analysis of the results of treatment of gastric and duodenal ulcers complicated by bleeding /A. S. Ermolov [i.] // Emergency surgery and other infections in surgery: V All-Russian Scientific Conference of General Surgeons, combined with the Plenum of the Problem Commission of the Russian Academy of Medical Sciences. – Rostov, 2008. – P.46-48.
4. Valenkevich L.N. Activity of intestinal disaccharidases in normal conditions and in patients with chronic enterocolitis // Ter. archive. – 1975. – No. 10. – P.97-100.
5. Hydrolysis and absorption are carried out in the small intestine after selective proximal vagotomy / V.S. Chudnova, V.V. Pronichev, A.Ya. Malchikov, V.V. Bryndin // Vestn. surgery. – 1989. – T.142, No. 4. – P.7-11.
6. Gulov M.K., Abdulaeva S.I. - "Current state of the problem of treatment of ulcerative lesions of the stomach and duodenum" // Avechinny Bulletin - No. 4.- 2015. p. -108-115.
7. Zherlov G.K., Koshel A.P., Gibadulin N.V. and others. The choice of surgical tactics for gastroduodenal ulcerative bleeding // Vestn. chi-surgeon.-2001.-No.4.- p. -41-44.
8. Ivashkin V.T., Sheptulin A.A. Clinic, diagnosis and treatment of malabsorption syndrome // Clinical. honey. – 2000. – No. 8. – P.27-31.
9. Kuzin N.M., Kanadashvili O.V., Ivanova Yu.V. Functional state of the gallbladder after gastrectomy with Roux-en-Y anastomosis. Khirurgich. magazine named after N.I. Pirogov. – 2000. – No. 5. – P.9-12.
10. Kuzin N.M., Kanadashvili O.V., Mayorova E.M. Functional state of the pancreas after gastrectomy with Roux-en-Y anastomosis. Khirurgich. magazine named after N.I. Pirogov. – 2000. – No. 4. – P.22-26.
11. Kurbanov K.M. Surgical treatment of postbulbar ulcers complicated by penetration into the head of the pancreas // Surgery. – 1999. – No. 2. – P.8-10.
12. Parfenov A.I. Digestion and absorption disorders in the most common diseases of the digestive system: Abstract of thesis. dis. ... Doctor of Medical Sciences. – M., 1985. – 46 p.
13. Popov V.A. Membrane digestion with surgical technology. – L.: Medicine, 1982, – 240 p.
14. Savelyev V.S., Kirienko A.I. Clinical surgery. National leadership//M.: GEOTAR - media, 2013. - P.-317-40.
15. Saidov D.S. - Dynamics of hemostasis indicators and their correction by optimizing infusion-transfusion therapy of ulcerative gastroduodenal chambers // Bulletin of the Academy of Medical Sciences of Tajikistan 2019.Vol. IX- No. 1. - S. - 67-75.
16. Tactics of duodenal bleeding in elderly and senile people / M.D. Diribov. [and others] // Emergency surgery and infections in surgery: V All-Russian Scientific Conference of Surgeons, ed. with the Plenum of the Problem Commission of the Russian Academy of Medical Sciences. – Rostov, 2008 – p.40-42.
17. Ugolev A.M. Theory of adequate nutrition and trophology. – St. Petersburg: Nauka, 1991. – 270 p.
18. Khadzhibaev A.M., Rakhimov R.I., Nabiev A.A. Results of surgical treatment of peptic ulcer in coronary heart disease // Inpatient replacement technologies: Outpatient surgery. 2020 (1-2) - p.-110-116.
19. Faitelberg R.O., Malakhovskaya V.M. Methods for studying intestinal hydrolysis and absorption are carried out in various pathologies // Physiol. magazine USSR named after Sechenov, – 1980. – T. 66, No. 2. – P. 227.
20. Churin B.V., Timchenko A.V. The front of motor activity in the process of periodic activity provides a method for healthy people and patients with peptic ulcer // Russian Journal. gastroenterol., hepatol., coloproctology. – 2001. – No. 2. – P.38-43.
21. Enteral tube feeding of patients after reconstructive operations on the stomach. /Sh.I. Karimov, A.A. Asrarov, B.B. Safaev, S.K. Orzimatov. //New in the diagnosis and treatment of the digestive system. Sat. scientific tr. II Tashkent State Medical Institute. – 1997. – P. 12-13.
22. Dahlquist A. Analysis of intestinal disaccharidases // Analyt. Biochem. – 1968. – Issue 22. – P.99-107.
23. Feracci V., Maru S. Purification of rabbit intestinal aminopeptidases and molecular properties // Biochim. Biophys. Act. – 1980. – T.599. – P.448-463.
24. Rosenthal M., Tomaszewski J. Die orrin - Ultramikromethode zur Bestimmung der d-xylose in Blut und Harn //Zschr. Medical laboratory technician. – 1975. – D.16, No. 4. – P. 191-196.