

Enzymatic and immunological aspects of the acute ulceration of the stomach and duodenal ulcers treatment of patients with acute disruptive pancreatitis

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Among the acute surgical diseases of the abdominal cavity of acute pancreatitis (AP) consistently takes the third place, preceded only by appendicitis and cholecystitis [1, 7, 8]. One of the most terrible and understudied complications of AP is the formation of acute erosions, ulcers of the stomach and duodenal ulcer (DU). According to a number of native authors [2, 3, 5], the occurrence of acute gastroduodenal ulcers or erosions with AP patients is observed in 8 – 10% of patients. With a systematic endoscopy, acute erosions and ulcers are detected at two thirds of patients [5]. Bleeding acute erosions and ulcers of the gastric mucosa are observed with 6 – 10% of patients. There are still unresolved issues of diagnosis, treatment, surgical approach. The actuality of the problem is indicated by mortality, which with this pathology happens in 80% of the cases [4, 6].

The **aim** of this work is a comparative assessment of stomach and duodenum acute ulceration treatment with patients with destructive pancreatitis in terms of enzyme-immunological spectrum of blood.

Materials and Methods

There were 87 patients observed, all having acute destructive pancreatitis (ADP), whose condition had been weakened by the formation of acute gastric erosions and duodenal ulcers. Among patients males prevailed (70%), aged 36 to 58 years. All patients were divided into two groups.

Group I (control) included 44 patients who underwent conventional anti-ulcer treatment according to existing schemes. Group II (basic) included 43 patients who had a conventional treatment combined with the methods of ozone therapy in the form of ozone-oxygen mixtures of erosive and ulcerative lesions of stomach and duodenum, followed by insufflation with the ozonated distilled water through the

zogastral probe. The diagnosis of acute stomach and duodenum exulceration was diagnosed based on clinical, laboratory data and fibrogastroscopy (FGC).

Ozonated distilled water was prepared by bubbling ozone-oxygen mixture through isotonic sodium chloride for 10 minutes. The saturation of the solution by ozone-oxygen mixture was carried out using the apparatus "Ozone UM-80" (Kharkov). Ozonized saline was administered intravenously at a rate of 80 drops per minute, the ozone concentration of 5-7 mg/l. The volume of intravenous infusion of ozonated saline wasn't exceeding 400 ml per day. Sessions repeated daily for 5 days. A nasogastric tube of PVC (diameter 2.5 mm, length 1 m) with distilled ozonated water of 100 ml three was administered 3 times a day. After removing probe patients received orally distilled ozonated-water of 100 ml three times a day.

To study the cells metabolic characteristics in relation to their functional properties and structural violations, cytochemical asset of pancreatic amylase (α-amylase) and lipase by spectrophotometry method was determined on the unit MAHMAT (France). The study of the immune status was carried out according to three main parameters of immunity – phagocytic, cell (lymphocytic) and humoral.

The immune status was determined by the following parameters:

- determination of phagocytic activity (PHA);
- determination of the relative and absolute content of the main populations of lymphocyte – CD3, CD4, CD8;
- the level of serum immunoglobulin classes evaluation – A, M, G according to Mancini method.

Digital material was treated by the methods of variation statistics with defining Student criterion. Reliable indicators considered at $P < 0.05$.

Results and Discussion

All patients immunograms in both groups at admission are characterized by moderately low or normal absolute lymphocyte number of peripheral blood (1604 ± 128 cells/mm), normal or moderately reduced number of T-lymphocytes (42.9 ± 2.69 cells/l), moderate inhibition of the ability of T-lymphocyte blast transformation under the influence of non-specific mitogen PHA (blasttransformation

stimulation index $17,5 \pm 1,5$), the relative number of B-lymphocytes ($16,0 \pm 2,0\%$), a moderate increase of IgM ($1,31 \pm 0,12$ g%), decreased levels of IgA ($2,19 \pm 0,12$ g%) and IgG ($9,88 \pm 0,63$ g%). The ratio of CD8 \pm/\pm CD4 increased to $0,41 \pm 0,06$ due to the increase of T-suppressors, and reduction of the T-helper cells.

A moderate reduction in the absolute number of peripheral blood lymphocytes (1440 ± 280 cells/mm) in the absence of a functionally defective macrophages (metamyelocytes, myelocytes) in combination with the normal suppressive activity or its slight increase was rated as the initial stage of the EIR.

The patients of the control group on the background of the traditional treatment showed a significant reduction in the relative number of lymphocytes, the absolute (910 ± 66 cells/mm) and relative number of T-lymphocytes ($38,62 \pm 2,29\%$), with respect to the relative number in lymphocytes ($13 \pm 1,8\%$), oppressed ability of T-lymphocytes to blast transformation AT PHA. The ratio of CD8 \pm /CD4 \pm grew ($0,87 \pm 0,28$), the IgA level reduced ($2,04 \pm 0,14$ g%) and IgG ($8,23 \pm 0,44$ g%).

Thus, acute destructive pancreatitis, complicated by the stomach and duodenum acute ulcers and erosions, accompanied by characteristic changes in the immune system, the severity and extent of which is correlated not only with the nosology form of disease, but with the prevalence of pus in the abdominal cavity as well.

With the infection generalization in the abdominal cavity relative and absolute number of lymphocytes progressively decreases, T- and B-lymphocytes, the number of transformed T-lymphocytes under the influence of non-specific mitogen PHA, macrophages digestion activity, the level of IgA and IgG, lymphocytes suppressor activity increased.

Therefore, secondary immunodeficiency involving all parts of immunity is developed with patients with EIR state.

In the immune system study of the control and study group in 7 days after the treatment start we received the following data (Table 1.): in the main group the indicators CD3, CD4, levels of immunoglobulins, as well as the phagocytic index (PHI) and the phagocytic number (PHN) normalize much earlier than in the control group. Thus, lymphocyte number a week after the treatment in the basic group makes

15,9±1,1%, while the control 19,7±1,7% at t=1,88, p> 0.05, the SD3 amount 41,7±3,54 vs. 62,1±3,2 at t=4,27, p<0.001, CD4 CD8 ratio 0,38±0,04 vs 0,42±0,02 at t=0,89, p>0.05, the level of IgA 2,17±0,11 g% vs 2,24±0,24 g% at t=0,27, p>0,05, IgM 1,22±0,09 g % vs. 1,48±0,09 g% at t=1,88, p>0,05, IgG 9,72±0,43% vs.12,54±0,84 g% at t=2,98, p<0.01, PHI 62,3±1,2 vs 79±7,1 at t=2,32, p<0.01, the PHN 8,6±0,4 vs 11,5±1 0 at t=2,69, p<0.01.

Table 1

The state of humoral and cellular immunity in the two groups of EIR patients

Index	Before treatment		In 7 days	
	Control group (n=44)	The core group (n=43)	Control group (n=44)	The core group (n=43)
Lymphocytes	17,5±1,1	18,1±0,8	19,7±1,7	15,9±1,1
CD3±	43,76±4,4	42,14±3,6	62,1±3,2	41,7±3,54
D8±/ D4±	0,49±0,02	0,47±0,03	0,42±0,02	0,38±0,04
IgA level	1,89±0,2	1,91±0,2	2,24±0,24	2,17±0,11
IgM level	1,00±0,08	0,99±0,09	1,48±0,09	1,22±0,09
IgG level	9,42±0,76	9,38±0,62	12,54±0,84	9,72±0,43
PHI	65±5,1	64±4,3	79±7,1	62,3±1,2
PHN	6,8±0,7	6,4±0,8	11,5±1,0	8,6±0,4

At admission, all patients had a significant increase in the level of lipase, and - amylase (Table 2.), at the same time there is a strong linear correlation (r=0,99 at p<0,05) between them. So, after 7 day treatment lipase number in the core group was 47,4±9,4, and in the control group – 95,8±13,7 (at a rate of 0-30), and pancreatic amylase level was 110,1±13,5 vs 164,7±156,7 (normal 0-96). Thus, the use of combined methods of ozone therapy in acute ulcers and gastroduodenal erosions treatment makes it possible by the 7th day to significantly lower enzyme indicators.

Table 2

Patients indicators of enzymes

Index	Before treatment		In 7 days	
	Control group (n=44)	The core group (n=43)		Control group (n=44)
lipase	220,4±13,7	211,8±14,6	95,8±13,7	47,4±9,4
- amylase	431,1±17,2	412,8±11,5	164,7±15,7	110,1±13,5

During the endoscopy 44 (51%) patients had localized ulceration in the stomach, 10 (12%) in the duodenum, 33 patients (37.9) they hit the stomach and duodenum. Acute erosion were observed at 28 (32.1%) patients, acute ulcers at 17 (19.5%), 42 (48.2%) had a combination of acute erosions and ulcers. Mostly acute ulcers were located in the antrum of the stomach – with 43 patients (49.5%), and erosion in the duodenal bulb – with 28 (32.1%) patients.

According to endoscopic monitoring in group 1 on day 8-9 62 (71.1%) patients noted healing of acute erosions, ulcers. In group 2 73 (83.9%) patients, healing of acute erosions, ulcers observed by 5-6th day, 14 (16.1%) – by the 8th day. Cicatrization deceleration of ulcerations in both groups due to the seriousness of their diseases that had caused their formation.

In the core group 5 (13.7%) and 8 patients (18.2%) in the control group with acute formation of erosions and ulcers, had complications due to the development of acute gastrointestinal bleeding. Bleeding from acute ulcers and erosions of the stomach and duodenum conservatively was stopped with all patients of the main group. With EGD multiple acute erosions and ulcers of the stomach and duodenum were revealed.

As for recurrent gastrointestinal bleeding 3 patients were operated in the control group: excision and suturing of acute bleeding gastric ulcers with selective vagotomy was performed. Only one patient had a successful surgery (66.7% postoperative mortality).

The average time of treatment in the core group took 22.1 bed-days, in the control – 29.4.

Thus, the use of the common treatment of acute ulcers and gastroduodenal erosions, provides with the positive effect only by the 8-9th day, while ozone therapy allows to reach the same results by 5-6th days. The trend towards the normalization of the examined indicators matches the terms of healing of acute ulcers and erosions of the stomach and duodenum.

Conclusions

1. During the acute destructive pancreatitis the majority of patients sick with leukocytosis, lymphopenia have marked changes in the three major components of immunity – phagocytic, the cellular and humoral, namely functional ability of neutrophils improved, the number of T-helper cells and B cells reduced, levels of IgA increased.

2. The use of combined methods on the background of ozone therapy against standard treatment can achieve normalization of the indicators of immunity, enzymes and accelerates the healing of acute ulcers and erosions of the upper gastro-intestinal tracts by the 3rd day compared to conventional methods of treatment, allows to shorten the average hospital stay for $7,2 \pm 1,3$.