Particular features of changes of the inhibitors proteinase in blood serum in the patients with chronic pancreatitis

G. R. Yuldasheva
Tashkent Advanced Training of Doctors Institute, Uzbekistan

Key words: chronic pancreatitis, pathogenesis, proteins and inhibitors of blood serum, enzyme-inhibitor disbalance, proteins in acute phase

The defeat of the pancreas as a result of the impact of unfavorable factors can clinically manifest itself from minor pain sensations to the hardest enzymatic shock [1, 2].

Chronic pancreatitis may develop many years without obvious clinical signs or with sharp short-term bouts of pain. Therefore, the most reliable diagnosis of pancreatitis and its clinical and morphological forms can be achieved by a comprehensive examination of the patient, including assessment of biochemical parameters of chronic pancreatitis is a shortage of highly active inhibitor of pancreatic elastase — α_1-antitrypsin and α_2-macroglobulin. The mechanisms of inflammation in any organ of proteolytic damage do not play such a role in the pancreas. It is believed that with the activation of proteolytic enzymes begin the inflammatory process in chronic pancreatitis. Hence the importance of studying the nature of proteinase inhibitors state changes that block proteolysis [3].

It is known that pancreatic enzyme proteins (trypsin, amylase) secreted into the small intestine, partially resorbed in the uncleaved form, whole molecules.In the blood, they bind antiproteinases (α_1-antitrypsin, α_2-macroglobulin form a complex, and thereby masked antigenic determinants of the protein. Pancreas resorbs hydrolase from plasma, and some of them captured by the Kupfferov's liver cells, and accumulates at sites of inflammation [4]. These literature relating to the dynamics of the reactants with the acute phase of inflammation and antiproteinases in patients with chronic pancreatitis do not illuminated.

The aim of research is to study the characteristic changes of reactive protein synthesized in the liver and serum antiproteinases in patients with chronic pancreatitis.

Materials and methods. The sample of 58 patients with chronic pancreatitis (49 women and 9 men) aged 36 to 77 years (mean age 52.3±2.7 years), disease duration from 1 year to 28 years. Biliary etiology of chronic pancreatitis was observed in 88% of patients, idiopathic — at 7.9%, alcohol — at 4.1%. The control group consisted of 15 healthy individuals. The diagnosis of chronic pancreatitis is set based on the characteristic symptoms: epigastric pain, nausea, constipation, frequent vomiting duodenal contents, flatulence; and based on instrumental and laboratory research. The content of CRP (C-reactive protein, gaptoglabin) and antiproteinases, (α_2-macroglobulin, α_1-antitrypsin were tested for biochemical analyzer "Sobas Emira" (ROCHE). The content of fibrinogen by Rutberg, antithrombin III in enzyme immunoassay analyzer. Used «HUMAN» company sets in all studies. The results are processed by the method of variation statistics. The significance of differences was assessed by Student's t test; differences were considered significant at $p<0.05$.

Results and discussion. C-reactive protein is an acute-phase proteins in blood plasma, is considered as the most sensitive laboratory marker of inflammation and tissue damage. Data on the value of C-reactive protein in patients with chronic pancreatitis are presented in the table.

As can be seen from the results of the study, in the surveyed persons C-reactive protein was significantly increased in 112.5 times and equals 102.2±8.93 mg/L (at a rate of 4.21±0.08 mg/l), indicating that damage endothelial cells of vessel walls, and also activation of complement component, monocytes, stimulation of adhesion molecule I CAM-1 and E-selectin on the endothelium surface.

For acute phase reactants relates fibrinogen, synthesized primarily in the liver. In analyzing the data presented in the table shows that in chronic pancreatitis patients there is an increase in the content of fibrinogen to blood plasma values of 3.83±0.13 g/l, which is 24% above baseline values, indicating that the inflammatory process. Antithrombin III — is α_2-globulins, along with protein is a valued member of the anticoagulation system. Antithrombin III binds all activated clotting factors related to serine proteases. Its activity increases sharply in the interaction with heparin on the endothelium surface that promotes rapid interaction of antithrombin site reactive with the active thrombin center and has anticoagulant activity.

In our studies, we see a significant increase in the level of antithrombin III, which is aimed at cooperation serine proteases for the relief of thrombotic complications. Deficit powerful protease inhibitor — α_1-antitrypsin is one of the risk factors for chronic pancreatitis and recurrence. Exacerbation of chronic pancreatitis, occurring with a high level in pancreatic blood, and in some forms of lysosomal enzymes indicates deficiency antiproteolitic protection. Hence the importance of assessing the state of proteinase inhibitors in the early blocking proteolysis and inhibiting its activation during inflammation.

An important function of α_1-antitrypsin is elastase-inhibiting activity and chymotrypsin proteases originating from granulocytes in inflammatory exudates and cause secondary damage.

Table 1

The content of the reactive protein and serum protease inhibitors in patients with chronic pancreatitis

Indicator	Healthy (control) n=15	Patients with chronic pancreatitis n=58
C-reactive protein, g/L	4,21±0,08	102,20±8,93*
Fibrinogen, g/L	3,40±0,24	3,83±0,13*
Antithrombin III, %	98,20±2,56	122,40±5,11*
α_1- antitrypsin, mcmol/L	56,30±3,44	22,80+1,24*
α_2- macroglobulin, mg/dL	194,60±8,71	298,20±5,24*
Haptoglobin, mg/dL	109,01±8,93	176,40±9,01*

Note: * — significance of differences $p<0,05$

As can be seen from the data in the table, in patients with chronic pancreatitis observed increased consumption of α_1-antitrypsin and its significant reduction in serum levels by an average of 60% ($p<0.05$).

Another class of endopeptidase inhibitor (serine, cysteine, aspartatmetalloproteinaza) is α_2-macroglobulin, which is an acute phase protein in the endothelium protects against the action of proteases. Analysis of the results indicates a significant increase of 1.5 times of the blood plasma protein, suggesting a chronic inflammatory process. Haptoglobin is also an acute phase protein involved in binding not only hemoglobin complex formation and having peroxidase activity, but also sufficiently inhibitory activity Cathepsin C, and L (lysosomal enzymes). In our studies, we observed a significant increase of 1.6 times the level of acute-phase proteins in blood plasma.

Conclusions. Thus, in patients with chronic pancreatitis showed a significant increase in levels of acute-phase proteins (C-reactive protein, fibrinogen, α_2-macroglobulin, haptoglobin) and increased intake of α_1-antitrypsin in the blood plasma.

References:

1. Губергриц Н. Б. Лечение панкреатитов. Ферментные препараты в гастроэнтерологии/Н. Б. Губергриц. — М. : Медпрактика-М, 2003. — 100 с.

2. Маев И. В. Болезни поджелудочной железы/И. В. Маев, Ю. А. Кучерявый. — М. : Медицина, 2008. — 558 с.

3. Bernard J. P. Molecular basis of chronic pancreatitis/J. P. Bernard // Recent Advances in the Pathophysiology of Gastrointestinal and Liver Diseases, Postgraduate Course, Nantes. — 1997. — P. 185–192.

4. Quantitative untersuchungen zur resorption von trypsin, chymotrypsin, amylase, papain und pankreatin aus dem magen-darm-trakt nach oraler applikation/J. Seifert [et al.] // Allgemeinarzt. — 1990. — Vol. 19. — P. 132.

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At studying of characteristic changes of reactive proteins synthesized in a liver and maintenances of antiproteinases in blood serum in the patients with chronic pancreatitis it is noted authentic increase of protein level in acute phase (the C-reactive protein, fibrinogen, an α-2-macroglobulin; gaptoglobine) and the wide consumption an α-1-antitripsina in blood serum.