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THE PROGNOSTIC VALUE OF LABORATORY PARAMETERS OF ACUTE PHASE PROTEINS IN THE DIAGNOSIS OF ACUTE PANCREATITIS

Ganiyev Andiyor Adizovich
Bukhara State Medical Institute

Annotation. The severity of clinical and laboratory manifestations of acute pancreatitis is directly proportional to the degree of morphological changes in the pancreatic parenchyma, where the most pronounced course is observed during the destructive process. To solve the issue of surgical intervention, all patients with acute pancreatitis need to conduct a laboratory study, where the most informative method of early diagnosis of the onset of development and a marker of purulent destruction in the pancreatic parenchyma is high levels of procalcitonin and lactoferrin in the blood serum.

Relevance. Over the past decades, the number of patients with acute pancreatitis has increased markedly in many countries of the world, and the quality of diagnosis has improved. Due to the improved diagnosis, pancreatitis began to be registered quite often: from 1 to 11% among all patients with acute diseases of the abdominal cavity. Nevertheless, as many believe, pancreatitis remains the least studied both in terms of etiology and pathogenesis, as well as in terms of diagnosis and treatment. One of the formidable complications of pancreatitis is pancreatic necrosis and its consequences (3,8,18,21,22). In recent years, the detection of acute forms of pancreatitis in children has been reported (10,18,23,24). Acute pancreatitis is most often contracted by the elderly and more often by women. The ratio of men to women is 1:8 - 1:10. In parallel with the increase in morbidity, the number of surgical interventions on the organs of this zone is also increasing, second only to the number of operations performed for acute appendicitis. (6,10,11). However, the outcomes of treatment of pancreato-hepatobiliary pathology remain unsatisfactory. Postoperative mortality in destructive and purulent-necrotic forms of pancreatitis ranges from 30 to 85% (11,14,25,26). This is mainly due to errors in diagnosis, untimely hospitalization, unreasonably prolonged conservative treatment, late operations, tactical errors during the operation and in the postoperative period (3,8,27,28,29,30,31,32,33,34).

At the same time, the lack of reliable laboratory methods for early and timely differential diagnosis and treatment control makes it difficult to choose medical tactics. And leukocytosis (2,5,35,36,37), ultrasound data are not reliable tests of the depth and severity of the inflammatory process in pancreatitis (3). To study the issues of molecular pathogenesis, develop laboratory methods for diagnosing and controlling the inflammatory process, immunochemical study of acute phase proteins (BOF) or reactant proteins associated with inflammation and reflecting different sides is very relevant the pathological process. Among them there are proteins that are widely used and so far only recommended for practical use as diagnostic tests. (1,4,7,9,12,38,39,40,41). In this regard, the surgical clinic has renewed interest in BOFs, which play an important and versatile role in the pathogenetic mechanisms of inflammation before surgery and after treatment (15,16,19,20). Laboratory tests reflecting inflammatory and acute phase reactions include the determination of C-reactive protein (CRP), fibrinogen degradation products (PDF), lactoferrin (LF), alphag-macroglobulin (MG), pregnancy-related alpha-glycoprotein (SBAG) and other proteins in biological fluids. The results of immunochemical analysis for acute phase proteins, along with such classical indicators as leukocytosis, ESR, "shift of the leukocyte formula to the left", etc., significantly expand the possibilities of laboratory diagnosis of inflammation. Therefore, the development of schemes for assessing the condition of patients with acute pancreatitis with the definition of a specially selected BOF group is a very relevant scientific and practical direction.

Thus, an in-depth study of the pathogenesis of acute pancreatitis (OP) and its complications requires the search for new methods for assessing changes in homeostasis in this disease. An analysis of the literature indicates that lactoferrin has now proven itself well in the diagnosis of many conditions associated with tissue destruction, which, according to many researchers, is considered an indicator of tissue destruction. Also, many researchers point to the high diagnostic significance of determining the level of procalcitonin (PCT) in the blood as one of the newest biomarkers for bacterial infection. It should be emphasized that acute pancreatitis is also characterized by excessive amounts of proinflammatory cytokines (TNF-a, IL-6, IL-10, IL-17A) which lead to the launch of a systemic inflammatory reaction ("cytokine storm") and the development of multiple organ failure and purulent-septic complications. Correlations of the studied cytokines with the main markers of endotoxicosis (BOF) were also revealed. All of the above indicate the expediency of

using these diagnostic markers of inflammation and cytokine status to assess hidden and erased clinical manifestations of the onset of destructive changes in pancreatic tissue in acute pancreatitis in patients, which will allow a differentiated approach to the treatment of this pathology and the prevention of complications both before and after surgery.

The purpose of the study: to determine the prognostic value of laboratory parameters of acute phase proteins in the diagnosis of destructive forms of acute pancreatitis.

Research materials and methods: 78 patients treated in the Department of surgery of the Bukhara branch of the Republican Scientific Center for Emergency Medical Care were examined. The patients ranged in age from 32 to 65 years. As a control, the serum of 15 volunteers aged 30 to 70 years old who did not have any clinical manifestations of inflammatory processes at the time of the study was studied. Hospitalization from the onset of the disease to 24 hours occurred in 40 (51.28%) patients, the total percentage of late hospitalization (after 24 hours) He accounted for 35 (48.72%) patients. Upon admission to the hospital and, if necessary, dynamic ultrasound examination of the abdominal organs was performed on Esaote - MyLab™X6 (Italy) or Mindray M5 (China) devices using convexic sensors with a frequency of 3.5 MHz, 7.5 MHz. The condition of the pancreas, liver, gallbladder, and extrahepatic bile ducts was assessed.

The most common concomitant pathology was a combination of arterial hypertension and coronary heart disease with diabetes mellitus and obesity. The presence of pathology of two or more organs or systems was noted in 92% of patients in the main group, which could not but affect the features of the clinical course of the underlying disease and the prognosis in patients of various age categories. The concentration of lactoferrin and procalcitonin in blood serum was determined by enzyme immunoassay in ng/ml by commercial test systems of Vector-Best CJSC».

Results and their discussion: According to the severity and nature of treatment: conservative, surgical, patients with acute pancreatitis were distributed as follows: the first group – 27 patients with edematous pancreatitis (OFP), the second group – 25 patients with sterile pancreatic necrosis (SP), the third group – 26 patients with infected pancreatic necrosis. Our studies have revealed a different ratio of changes in the level of acute phase proteins depending on the course of the disease against the background of complex treatment. Acute phase proteins play a very important role in determining surgical tactics in a short period of time when managing this

contingent of patients in a hospital, that is, determining the timing of indications for emergency surgery. An analysis of the modern literature of recent years has shown that procalcitonin and lactoferrin have proven themselves well in the diagnosis of many destructive conditions, which, according to many researchers, indicate their high diagnostic significance.

As the results of the studies presented in Table 1 show, the dynamics of the content of procalcitonin and lactoferrin in the blood serum has a peculiar character of changes. At the same time, it should be noted that the content of procalcitonin in the blood serum of healthy people is less than 0.1 ng/ml. In patients of the first group with edematous pancreatitis (OFP), the level of procalcitonin was significantly increased several hundred times higher than the control values. A similar dynamics was noted in the indicators of procalcitonin in patients of the second group. In patients of the third group with infected pancreatic necrosis, this indicator exceeded the baseline level by several thousand times. According to some researchers, a sharp increase in the level of procalcitonin in the blood indicates the possibility of developing a septic condition in this contingent of patients and is an unfavorable prognostic criterion, since in this situation bacterial endotoxins are a stimulant of procalcitonin synthesis. The revealed indicators of procalcitonin in patients with various forms of pancreatitis indicated the systemic nature of the manifestations of the inflammatory process, which could turn into a pronounced inflammatory and destructive process and end in various severe complications.

Table 1

Comparative assessment of the content of procalcitonin and lactoferrin in the blood of patients with acute pancreatitis

Indicators	The control group (n =15)	I-group (n =27)	II-group (n =25)	III-group (n =26)
Procalcitonin ng/ml	0,005±0,0001	0,121±0,01*	1,020±0,08*	8,07±0,57*

Lactoferrin ng/ml	252,71±16,84	417,56±15,92	2173,14±19,56 *	2968,79±31,83 *

Note: *- the validity of the differences (P< 0,05) ,

As can be seen from the presented research results, this clinical condition was pronounced in patients of group 3 with infected pancreatic necrosis. A study of the level of lactoferrin in the serum of patients with acute pancreatitis of varying severity showed a clear dependence of the concentration of lactoferrin on the degree of destruction in the pancreatic parenchyma. Lactoferrin is known to be involved in the retention of neutrophils in the inflammatory focus (5,2,11). With excessively prolonged persistence of the neutrophil phase, there is a real threat of necrosis and purulent melting of tissue and the development of abscesses. In addition, lactoferrin binds lipopolysaccharides (LPS) of bacterial walls, and the oxidized form of iron included in the protein initiates their peroxidation. This leads to a change in membrane permeability and subsequent cell lysis (12,13,17).

As can be seen from the results of the studies presented in Table 1, the content of lactoferrin in the blood serum had a peculiar character depending on the severity of the disease. Thus, in patients of group 1 with catarrhal cholecystitis, an increase in lactoferrin levels was 1.6 times higher than the control values of healthy individuals upon admission to the hospital. It should be noted that in the destructive form of pancreatitis, serum lactoferrin levels were at higher values relative to the control values. Thus, in patients of group 2, it exceeded the initial indicator by 8.7 times, whereas in patients of group 3 - by 11.5 times. A high concentration of LF may affect the change of cellular phases in the focus of acute inflammation, slowing down the change of polymorphonuclear leukocytes by a population of monocytes - macrophages. Recently, a number of agents have been discovered that can stimulate the expression of the LF gene, including bacterial lipopolysaccharides (LPS). Consequently, high values of lactoferrin in the examined patients, especially the destructive form of the disease, are accompanied by a change of cellular phases in the focus of inflammation, where the persistence of the neutrophil phase leads to destruction and purulent melting of tissue.

Consequently, the success in the treatment of patients with acute pancreatitis depends on the accuracy of timely diagnosis of the onset of pathological changes in

the pancreatic parenchyma, which determine the tactics of treatment and the urgency of surgical intervention. The choice of surgical aid in this situation, apparently, should be determined primarily by its effect on the body and, in particular, on the initial systemic disorders.

Thus, the obtained research results indicate that there is a clear dependence of the concentration of procalcitonin and lactoferrin in the blood on the degree of development of the destruction process in the tissues of the pancreatic parenchyma, which is more pronounced in patients of groups 2 and 3 relative to the indicators of lactoferrin in the blood.

Conclusions

1. The severity of clinical and laboratory manifestations of acute pancreatitis is in direct proportion to the degree of morphological changes in the pancreatic parenchyma, where the most pronounced course is observed during the destructive process.
2. All patients with acute pancreatitis, in order to resolve the issue of surgical intervention, it is necessary to conduct a laboratory study, where the most informative method of early diagnosis of the onset of development and a marker of purulent destruction in the pancreatic parenchyma is high levels of procalcitonin and lactoferrin in the blood serum.

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