

OXIDATIVE HOMEOSTASIS CONDITION IN PATHOGENESIS, DIAGNOSTICS AND PROGNOSTICATION OF INFECTED PANCREATIC NECROSIS

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A complex dynamic analysis of oxidative homeostasis state in patients with various forms of acute pancreatitis was carried out. It has been established that an authentic decrease of minimal chemiluminescence intensity indexes and blood serum antioxidant activity number can serve as an additional criterion of infected pancreatonecrosis early detection. The lack of the tendency for erythrocyte peroxidative resistance increase in the postoperative period in pancreatonecrosis patients testifies to a poor prognosis of the disease. The complex diagnostics perfection allows optimizing the surgical approach and reducing the number of early traumatic surgical interferences to the minimum.

Keywords: diagnostics, prognostication, chemiluminescence analysis, free radical oxidation, acute pancreatitis, pancreatonecrosis

Introduction

Over the last 30 years a world-wide tendency for acute pancreatitis case rate increase has been depicted [1, 4]. The basic quota of the patients is still formed by the persons of active working age, and among the causes of the disease the alcohol dependence and alimentary factors rank first [5, 7, 10].

The number of the disease destructive forms, which make up to 44%, grows everywhere [2, 6, 7, 11]. Thereat, if the total mortality for the last 10 years has a tendency to decrease, then the postoperative one, reflecting the patients' most serious category treatment results, is still calculated by double figures [1, 3, 8].

The purpose of our research has been the improvement of acute pancreatitis patients' treatment results due to the application of a new diagnostic complex based on the chemiluminescence analysis use.

Materials and methods

Under our supervision there were 160 patients with various forms of acute pancreatitis aged from 22 to 76 years old. 54 acute pancreatitis patients having received treatment in the general surgery clinical unit of the Krasnoyarsk State Medical University named in honour of V.F.Vojno-Yasenetskij during the period of 2003-2005, their chemiluminescence kinetics features being estimated retrospectively, the ozone therapy

method being not used, made the first group. The prospective research was carried out during the period of 2006-2009 and included 106 patients of the second group, the pancreatitis destructive form diagnostics and prognostication developed criteria being used for them.

The acute pancreatitis patients' examination included general clinical, laboratorial and instrumental methods. The acute pancreatitis severity was evaluated according to the scale of V.B. Krasnogorov in all the patients. The average score in the clinical groups made $4,6 \pm 0,31$, that conformed to a severe pancreatitis. The crucial moment in the destructive pancreatitis form verification was considered a bacteriological research.

For the peroxidative homeostasis state estimation the method of iron-induced luminol-dependent chemiluminescence with the application of the biochemiluminometer BXJI-06M was used. Erythrocytes and blood serum served as the chemiluminescence analysis object.

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Results and discussing

The chemiluminescence analysis of the blood serum testified that in all the edema-

tous pancreatitis patients an authentic 3,14 times increase of the maximal luminous intensity (I max) with respect to the norm and considerably less manifested light-sum growth - 1,92-fold, are recorded at their admission. The coefficient K reflecting the total antioxidant activity of the serum exceeded the admission control indexes 1,65 times. In the dynamics of the disease together with peroxide concentration a gradual decrease of the blood serum antioxidant potential was registered, the tg a and coefficient K decrease testifying to the fact.

In spite of the fact that antioxidant activity indexes in the edematous pancreatitis didn't differ authentically from the control ones, beginning with the third day of traditional therapy, the total blood serum oxidative activity remained high.

The highest admission chemiluminescence intensity values were registered in sterile pancreatonecrosis patients. The level I max exceeded the age norms indexes 7-fold within the first week of hospital treatment and decreased authentically to the 21st day only against the traditional therapy background.

In the patients with diagnosed infected pancreatitis an extremely low chemiluminescence intensity value within the first week of hospital treatment came under notice, it not exceeding 30 mV irrespective of the patient's age and sex. The coefficient K in this group remained more than twice lower compared to the age group indexes for the entire research time. The infection process resolution criterion in the pancreatonecrosis patients has been the increase of hydroperoxide content increase in the blood serum (3,8-fold compared to the index I max) and the increase of total anti-oxidative activity according to the chemiluminescence analysis data.

According to the contemporary idea the process of free radical oxidation is of physiological character and always attends vital processes of a healthy cell. That is why the oxidative homeostasis profound disorders detected by us in the infected pancreatonecrosis patients signalize about a massive ne-

erosis extent, the formation of a superantigen and the overlay of bacterial contamination, which require a high flow of active oxygen forms, in the early stages of the disease already.

The chemiluminescence analysis was prospectively used by us in the complex diagnostics of infected pancreatonecrosis in 55 patients with various forms of destructive pancreatitis. Thereat, the sensibility, specificity, predictive value of both negative and positive results of the method offered by us achieved 85-90%.

There were no authentic differences of erythrocyte oxidation resistance values in sterile and infected pancreatonecrosis detected. At the admission to the hospital the maximal chemiluminescence intensity exceeded the age norm 1,7 times, and the light-sum - 2,1 times. The minimal erythrocyte resistance at the acute pancreatitis destructive forms occurred right after the operative intervention performance, the highest light-sum value conforming to the top of chemiluminescence intensity.

An increase of erythrocyte resistance, peroxidation and antiperoxidant defence parameters approached normal ones on the 20th day within the postoperative period in the patients with destructive pancreatitis at a favorable course of the disease.

In the 9 patients died of pancreatonecrosis a decline of erythrocyte chemiluminescence intensity was registered in the early postoperative period against the background of the light-sum double increase, that testified to the erythrocytic membranes' destabilization. There was no tendency to the increase of oxidation resistance of erythrocytes depicted in those patients in the following.

The perfection of complex diagnostics in the patients of the second group allowed minimizing the number of early traumatic surgery interferences owing to the peritonitis unascertained source cases number reduction and infected pancreatonecrosis overdiagnosis.

When defining the infected pancreatonecrosis criteria the intensive care volume in the preoperative period was extended. Af-

ter the necrosis presumptive extent estimation with the help of V.B Krasnogorov's prognostic scale at the score less than 6 mini-approach operations were performed, more and equal to 6 - supramedian and laparotomic approach operations with pancreas abdominalization, duct-rinsing drainage, peritoneal omental sac marsupialization and nasointestinal drainage.

The infected pancreatitis diagnostics improvement allowed restricting the indications for extensive and traumatic single-step interferences and expanding the indications for staging surgical sanitations.

The operations on pancreatonecrosis were performed one time and in the mode of relaparotomies: "programmed" and "on-call" ones. In the first group patients at the lack of approachable criteria of the disease course prognostication and high traumatism of operations the surgical aid was tended to be restricted by a single interference, which could include all the programmed volume. In the infected pancreatitis patients of the second group the diagnostics improvement allowed restricting the indications for extensive and traumatic single-step interferences and expand the indications for staging surgical sanitations.

As a whole, the perfection of complex diagnostics allowed improving the results of acute pancreatitis patients' treatment and reducing the level of postoperative lethality from 32,1 % to 20,7%.

Conclusions

1. In edematous pancreatitis patients an authentic 3,14 times increase of the maximal luminous intensity with respect to the norm is registered at the admission. The blood serum chemiluminescence breakout amplitude in sterile pancreatonecrosis patients exceeded the age norm values 7, 16 times. In infected pancreatonecrosis patients the blood serum chemiluminescence intensity 2,5-5-fold decrease is registered within the first week at the hospital.

2. The criteria, which are indicative of the infected pancreatonecrosis development, are the values of maximal serum chemiluminescence intensity less than 30 mV, the coef-

ficient K less than 0,056 c.u. with the sensibility and specificity of 92,5% and 83,7% accordingly. The poor prognosis criteria of the disease is the decline of erythrocyte chemiluminescence intensity against the background of double increase of light-sum and the lack of a tendency to the increase of peroxidation resistance of erythrocytes in the course of the disease.

3. The perfection of complex diagnostics and prognostication of pancreatonecrosis severe forms course allowed improving the results of acute pancreatitis patients' treatment and reducing the level of postoperative lethality from 32 1 % to 20,7%.

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