Background

Acute pancreatitis can quickly progress from mild to severe form due to the formation of proinflammatory mediators and the development of systemic inflammatory response syndrome, activation of reactive oxygen species and lipid peroxidation, disorder of microcirculation. One of the difficult and unresolved tasks ultimately remains possible correction of oxidative stress, defining the role and place of antioxidant therapy in the treatment of acute pancreatitis.

Materials and methods

129 patients with acute pancreatitis were assessed (88 men, 41 women, with average age 46.09±13.78 years, and range from 19 to 82). 59 patients (45.7%) had edematous acute pancreatitis, 70 patients (54.3%) had destructive form. Patients were divided into three groups. Patients from the first group together with full complex of intensive therapy were treated with mexidol (mexidol group, n = 41), in the second group together with full complex of intensive therapy patients were treated with ascorbic acid (ascorbic acid group, n = 41), and in the third group patients received only full complex of intensive therapy (n=47). Complications and results including organ dysfunction, duration of stay in intensive care ward, and mortality were compared. Moreover, glutathione peroxidase, glutathione reductase, superoxide dismutase, malondialdehyde, protein carbonyl groups were investigated to evaluate the inflammatory reaction. Statistical analyses were performed with SPSS 20 (©SPSS Inc.).

Results

At the initial stage of acute pancreatitis oxidative imbalance develops in the blood due to the intensification of the reactive oxygen species, lipid peroxidation and the formation of reactive oxygen species, which accompanied by compensatory activation of peroxidation protection enzymes in the blood (increased activity of SOD) and depletion of glutation-depending enzymes activity of the blood. Increasing severity of systemic inflammatory response syndrome is associated with high content of markers of oxidative stress in blood.

On the third and seventh day of treatment in patients who received mexidol the severity of systemic inflammatory response syndrome was 23.3% and 23.5% lower than in the comparison group (p <0.05). Reducing of systemic inflammatory response syndrome was also in group with ascorbic acid at the 7th day, and it was significantly lower by 17.6% than in the comparison group (p <0.05).

The degree of oxidative stress was significantly higher in the comparison group, while under treating by antioxidants (mexidol and ascorbic acid) reducing of oxidative stress observed more clearly and quickly.

The duration of treatment, the incidence of infectious complications and mortality were different, but were not credible, while difference in the frequency of organ disorders to the seventh day of treatment were detected (21.9% mexidol group, 22.5% in the group of ascorbic acid against 41.3 % in the comparison group, p = 0.037 and p = 0.044 respectively).

Conclusion

Adding antioxidants (mexidol and askorbіnic acid) to intensive therapy of acute pancreatitis allows to change level of oxidative stress, accompany the systemic inflammatory distress syndrome and organ dysfunction.