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THE EFFECT OF NO SYNTHASE ACTIVITY MODULATORS ON THE SEVERITY OF LEUKOCYTOSIS IN PERITONEAL FLUID OF EXPERIMENTAL PERITONITIS

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Relevance. One measure of the activity of the inflammatory process is leukocytosis. Leukocyte numbers in the peritoneal fluid significantly increase when peritonitis, a severe form of abdominal inflammation, develops. When pathogenetic therapy is administered, a decrease in leukocytosis is frequently accompanied by a decrease in the severity of peritonitis and shows how well the drugs are working. Studying leukocytosis in the context of modulators of NO synthase, an enzyme that produces NO, a chemical with both pro- and anti-inflammatory qualities, is interesting.

Aim: to study how modulators of NO synthase activity affect the degree of leukocytosis in experimental peritonitis.

Materials and methods. In accordance with V. A. Lazarenko et al. (2008), the study animals (n = 90) were split into five equal series and given intraperitoneally, 0.6 ml/100 g body weight: Series 1 (control) – 0.85% NaCl; Series 2–5 – 15% faecal suspension (experimental peritonitis, EP). Following this, intramuscular administration of the following was performed: Series 1-2: 0.85% NaCl; Series 3: NOS substrate: L-arginine (L-Arg), 300 mg/kg; Series 4: inducible NOS inhibitor: aminoguanidine (AG), 15 mg/kg; Series 5: L-Arg and AG in comparable quantities. To ascertain the WBC count, which was carried out in a Goryaev chamber, all investigations were carried out after half a day, one day, and three days. In order to do this, 20 µl of peritoneal fluid was added to 400 µl of 3% acetic acid. Counts were then carried out in 100 large squares of the Goryaev grid using the formula $L = 50 \times A \times 106/l$, where A is the total WBC count in 100 large squares of the Goryaev chamber and L is the number of WBC in 1 litre of peritoneal fluid. Nonparametric techniques were used for statistical processing.

Results and their discussion. When the iNOS inhibitor AG and the NOS substrate L-arg were given to rats treated with EP, the total quantity, relative abundance, and absolute abundance of different leukocyte types in the peritoneal fluid as well as the phagocytic activity of peritoneal leukocytes were changed.

Furthermore, the total number of leukocytes in the peritoneal fluid after one day of EP was 1.3 times ($p < 0.05$) lower than after half a day; after three days, it was 1.1 times ($p > 0.05$) lower than after half a day; and after one day, it was 1.5 times ($p < 0.05$) lower, indicating that the red bone marrow had the least noticeable reaction. When compared to the control animals, rats given L-arg and AG combined continued to show changes in the examined parameter in the pancreas and blood throughout the whole study period. Leukocyte counts also increased by 6.1 times ($p < 0.001$) after half a day, 8.1 times ($p < 0.001$) after one day, and 5.5 times ($p < 0.001$) after three days.

Additionally, the overall leukocyte count in the peritoneal fluid decreased by 28 (26; 29)%, $p < 0.01$, after one day, by 24 (18; 24)%, $p < 0.01$, after three days, by 37 (34; 39)%, $p < 0.01$, and by 18 (17; 19)%, $p < 0.01$, after one day, by 11 (11; 12)%, $p < 0.01$, and by 25 (23; 25)%.

Conclusions. Consequently, the least noticeable leukocytosis in peritoneal fluid was observed throughout the development of EP in rats when a combination of L-arg and AG was introduced. This could be because of L-arg's anti-adhesive properties and the suppression of pro-inflammatory cytokines and reactive oxygen species when AG is introduced, which lessens the severity of inflammation.