EFFICIENCY OF DETERMINATION OF ACUTE PHASE PROTEINS AND PROCALCITONIN UNDER THE CONDITIONS OF SIMULATING INFECTIOUS ARTHRITIS

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Acute phase proteins ceruloplasmin, haptoglobin, C-reactive protein (CRP) and procalcitonin are markers that characterize the inflammatory process. C-reactive protein is one of the central
components of the acute phase (AF) and is a generally accepted indicator of inflammatory processes.

**Aim.** Determination of the level and efficiency of determination of acute-phase proteins (CRP, haptoglobin, ceruloplasmin), as well as procalcitonin under the conditions of modeling infectious arthritis.

**Materials and methods.** Experimental studies were conducted on 52 white male Wistar rats. A model of infectious arthritis was created for seven days by daily injection of 0.02 ml of S. aureus 108 No. 209 into the knee joint of a rat. The animals were divided into groups - and vivarium control. The following model of drug administration was used for the experimental groups: a single daily injection of 0.02 ml of flosteron into the knee joint for seven days (group II); daily single administration for seven days of 0.02 ml of S. aureus 108 No. 209 (III group); daily one-time alternating (every other day) administration for seven days of 0.02 ml of flosteron and 0.02 ml of S. aureus 108 No. 209 into the knee joint (group IV). The effectiveness of the drugs was observed 3 and 14 days after administration.

**Results.** It was established that the concentration of haptoglobin was significantly increased in the blood serum of rats both after 3 and 14 days in all studied groups of animals compared to the control. The greatest increase relative to the control values was noted 3 days after the seven-time injection of S. aureus 108 #209 into the knee joint. However, after 14 days it was already not so significant and significantly lower (by 85.33%) compared to the measurement after three days. Only in rats after a 14-day alternating (every other day) injection of 0.02 ml of flosteron and 0.02 ml of S. aureus 108 No. 209 into the knee joint was observed a probable increase in the level of haptoglobin by 775.08% (P<0.05) compared to the control and 77.78% reduced compared to the measurement after three days. The concentration of ceruloplasmin in blood serum increased in all experimental rats during the entire observation period and differed little between 3 and 14 days. The content of C-reactive protein in blood serum increased in all studied groups of rats without exception, which proves its high specificity for detecting inflammatory processes of various severity. The concentration of procalcitonin was most likely to increase by 235.0% 3 days after alternating (every other day) administration of 0.02 ml of flosterone and 0.02 ml of S. aureus 108 No. 209. It was slightly lower by 120.0% under the same conditions experiment after 14 days. This indicator probably increased by 65% 14 days after the 7-time introduction of
S. aureus
108 #209. In the rest of the experimental animals, the PCT concentration did not change.

Conclusions. The determination of haptoglobin reflects, first of all, the primary activation of the inflammatory process, which was enhanced by the hormonal drug flosteron. However, its determination can be effective over a longer period of time, as several factors lead to a bacterial infection, reinforcing each other. At the same time, the synthesis of ceruloplasmin increases precisely during the first three days of the infectious process, which turns it into an effective marker for detecting early infectious complications. The dynamics of changes in the level of C-reactive protein in blood serum showed the highest correlation with the activity of the infectious process, which proves its high efficiency for detecting inflammatory processes of various severity, choosing adequate treatment and predicting the course of the disease.

Key words: haptoglobin, ceruloplasmin, C-reactive protein, procalcitonin, infectious arthritis.

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References


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