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Search
Newsletter
Authors Pathway
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Journal Abstract

The effect of maximal physical effort (the refusal test) on erythrocytic system parameters, hemoproteins and erythropoietin concentrations in blood of junior ice hockey team

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We tested the influence of maximal physical effort on selected blood parameters. This exercise was performed by twenty-two junior ice hockey players during the work on a cycle ergometer with the increasing load i.e. the refusal test. In blood taken before and just after exercise red blood cells (RBC), haematocrit (HCT), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), hemoglobin concentration (HGB), myoglobin concentration (Mb) and erythropoietin concentration (EPO) were determined. It was found, that the maximal physical effort caused statistically significant increase of following parameters: mean red blood cells, hematocrit value and average hemoglobin concentration. Statistically significant increase of the average myoglobin concentration in sportsmen with the initial myoglobin concentration which was at the normal level (subgroup A, n=11) was found. On the other hand, mean corpuscular hemoglobin concentration underwent statistically significant decrease. It was proved, that after the refusal test mean corpuscular volume, mean corpuscular hemoglobin, average myoglobin concentration in athletes with the initial relatively high myoglobin concentrations (subgroup B, n=11) and average erythropoietin concentration did not show any statistically significant changes. Physical effort causes the plasma volume changes, as a result of water migration between extravascular and intravascular spaces. It was calculated that the plasma volume decreased on average about 9.055± 4.293%. In the group of examined athletes, the statistically significance decreases of blood plasma volume caused the increase of plasma components. Ascertained changes of myoglobin concentration in subgroup A after maximal work are big enough that they do not result only from decrease of the plasma volume.

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Back