UDC 636.4:612.017/.8

DYNAMICS OF SEGMENTED NEUTROPHILS COUNT IN BLOOD OF PIGS OF DIFFERENT TYPES OF NERVOUS SYSTEM UNDER INFLUENCE OF BIOLOGICAL STIMULUS

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The purpose of the research – to determine the degree and nature of the impact of typological features of nervous system on manifestations of immunity in the body of pigs, particularly the dynamics of segmented neutrophils (hereinafter – neutrophils) as an important part of nonspecific protection under the influence of biological stimulus (BS).

According to the results of testing the conditioned reflex activity by the methods of the Department of Animals Physiology, Pathophysiology and Immunology of the National University of Life and Environmental Sciences of Ukraine, the typological experimental groups of pigs were formed: strong balanced mobile; strong balanced inert, strong unbalanced and weak types of higher nervous activity. After that all animals were vaccinated (initial biological stimulation) against porcine reproductive and respiratory syndrome virus by Suiprovak-PRS vaccine manufactured by Hipra (Spain) with revaccination after 28 days (repeated biological stimulation). Before the introduction of BS (initial state) and after 3, 7, 14, 21, 28 days after, and after 3, 7, 14, 28 days after re-introduction of BS in all animals the relative (leukogram) and absolute neutrophil count were examined according to leukogram analysis and the total count of white blood cells. Blood smears were stained with Romanovskiy-Himza. The cells were differentiated under oil immersion with subsequent recalculation in absolute values.

It was established that the biological stimulus in representatives of stronger types, especially in balanced mobile, at the beginning causes increase of segmented neutrophils count. Repeated impact causes increase in the number of these cells in individuals of weak type of higher nervous activity. Pigs of strong balanced mobile type have the highest relative and absolute number of segmented neutrophils. Because of the influence of antigen the relationship between the basic properties of nerve processes and absolute neutrophil count increased, then –slightly decreased, and then changed insignificantly until the end of experiment. The average correlation coefficient during the impact of BS was similar for strength, balance and mobility of cortical processes ($p < 0.05–0.001$). This suggests a complex participation of strength, balance and mobility of cortical processes in the regulation of the absolute number of neutrophils in blood of pigs both before and during the response to BS. Obviously, that’s why this hematological parameter under the impact of BS varies less than the relative number of neutrophils.

Nevertheless, the analysis of variance has shown somewhat different results. Before the action of BS only the balance of cortical processes (η^2_x = 0.22 at $p<0.05$) had significant influence on the absolute number of these cells. Irritation activated strength (η^2_x = 0.22 at $p <0.05$ for the third day after the primary action BS) at a constant meaning of balance impact and a slight increase (trend) of impact the mobility of excitation and inhibition in the cortex. Future, the influence of all properties of cortical processes significantly decreased. Repeated irritation caused an increase in impact strength of cortical processes on absolute neutrophil count to a level η^2_x = 0.12–0.17 ($p<0.05$), followed by a decrease to the initial values.

Strength of influence of balance of cortical processes was low during the period of BS action, and the impact of mobility – increased to 0.27 ($p <0.05$) at day of repeated administration of antigen and forwards didn't differ from the primary.