The work of N. V. Puchkov, G. V. Golodets, and others [3, 6, 8] has shown that mediators can exert a significant action on the phagocytic activity of leucocytes: sympathicotropic substances stimulate phagocytosis, while vagotropic ones (acetylcholine) depress it. M. Ya. Mikhelson’s experiments [7] showed that narcotic substances exert a powerful inhibitory action on cholinesterase, both in vivo and in vitro. It might be supposed that anesthetics cause a rise in the acetylcholine content of the tissues, and hence to an inhibition of phagocytosis. When the blood samples were taken during the stage of excitation, in which the tonus of the sympathetic system was raised, the increased production of sympathicotropic substances heightened the phagocytic activity of the leucocytes.

LITERATURE CITED


EFFECT OF BARBITURATES ON THE DIFFERENTIAL CELL COUNT OF PERIPHERAL BLOOD OF NORMAL ANIMALS AND IN EXPERIMENTAL ANEMIA

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The present paper gives the results of an investigation into the effects of some barbiturate hypnotics on the differential cell count of peripheral blood. It is a continuation of earlier published researches [1].

* In Russian,
** Original Russian pagination. See C. B. Translation.
Effect of Noctal and Sonbutal taken over a long time on the differential cell count of peripheral blood

Groups of 10 mice each were given daily subcutaneous injections of 0.5% Noctal or Sonbutal solutions, to which a few drops of 1 N NaOH had been added to dissolve the drug.

The dosage levels were such as to cause sleep lasting from 2 to 5 hours, viz., 0.5–0.7 mg of Noctal or 0.6–0.7 mg of Sonbutal per 10 g body weight.

The blood examinations (hemoglobin, erythrocytes, leucocytes, differential cell count, reticulocytes, thrombocytes) were done twice before the administration of barbiturates, and twice during administration. The mice were weighed before and during the experiment. The results of the experiments were subjected to biometrical evaluation, and are presented in Figure 1.

The only changes seen during prolonged administration of barbiturates were a slight reticulosis with Noctal, and a slight fall in reticulocyte count with Sonbutal.

A comparison of these results with those found earlier [1] for other barbiturates (Barbamyl, Nembutal, and Medinal) shows that the greatest effect on the blood is exerted by Barbamyl, prolonged administration of which lowers the hemoglobin and erythrocyte count, and raises the reticulocyte count.

Effect of a single dose of Noctal or Sonbutal on the differential cell count of peripheral blood

The animal material consisted of mice (10 for each drug), rabbits, and dogs.

The blood examinations were done before administering the drug, during profound sleep, and 3 and 24 hours after wakening.

The leucocyte count fell by an average of 52.7% during Noctal-induced sleep, and rose at the moment of wakening, although still remaining 36.6% below the initial value, which was found 24 hours after wakening. The differential cell count showed a small increase in granulocytes. The reticulocyte count did not vary.

The leucocyte count fell only very slightly during Sonbutal sleep, and was above the initial value by an average of 37% at the moment of wakening. The differential cell count showed a small rise in the proportion of granulocytes (Figure 2).