

AROUSAL EFFECT OF HETEROCID – 321 ON A MODEL OF KETAMINE ANESTHESIA

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Rationale. The mechanism of action of any antidote (including antinarcosis) theoretically is reduced to a rapid decrease in the concentration of toxic substances (TS) in the body. In practice, it can be realized in several ways: by activation of the emetic and breathing reflexes; reaction of chemical transformation of TS to the less toxic structure, physical or chemical adsorption on a surface of the sorbent; stimulation of drainage systems (intestine, kidney, skin); metabolic degradation due to the activation of enzyme systems of the liver or sequential combination of the mentioned options.

The aim of our research was to study the possible effects of awakening substances on the respiratory center (RC) of the brain.

Materials and methods. Evaluation of the impact of the substances under study on the RC was performed on a model of ketamine anesthesia on nonlinear white mice weighing 20-30 g. The criteria of the efficiency of action on the RC served was a respiratory rate (RR) in several phases of anesthetic sleep before and after injection of awakening medicines.

The experiment involved three groups of animals, each one was injected intra peritoneally (i.p.) with ketamine. The respiratory rate (RR) was counted in the range of 60 seconds immediately after the mice got the lateral position (RR1), on the 5th (RR2), on the 10th (RR3) minutes of the anesthetic sleep, on the 15th minute (RR4) immediately after the i.p. injection with Heterocide-321 or sulfokamfokaine, as well as during the awakening of animals on the 20th (RR5), the 25th (RR6) and the 30th (RR7) minutes. Last counting (RR8) was carried out immediately after the mouse awakening (taking the position on all four legs).

The reliability of the results was evaluated by nonparametric Newman-Keuls criteria with the help of Statistica 10.0 program.

Results and discussion (Diagram 1). When ketamine was administered it showed that RR1, RR2, RR3 significantly ($p < 0,05$) decreased respectively from 116.31; 91.30 to 86.77 breaths per minute (B/min). This experiment confirms the inhibitory effect of the anesthetic drug on the central nervous system in general and for RC particularly. Counting the RR immediately after the injection of Heterocide -

321 and sulfokamfokaine showed a substantial increasing accordingly - RR4 by 79.7% () and 84.1%; RR5 by 61.5% and 69.2%; RR6 by 43.3% and 46.9%; RR7 40% and 38%; RR8 30% and 26% higher than in the control group.

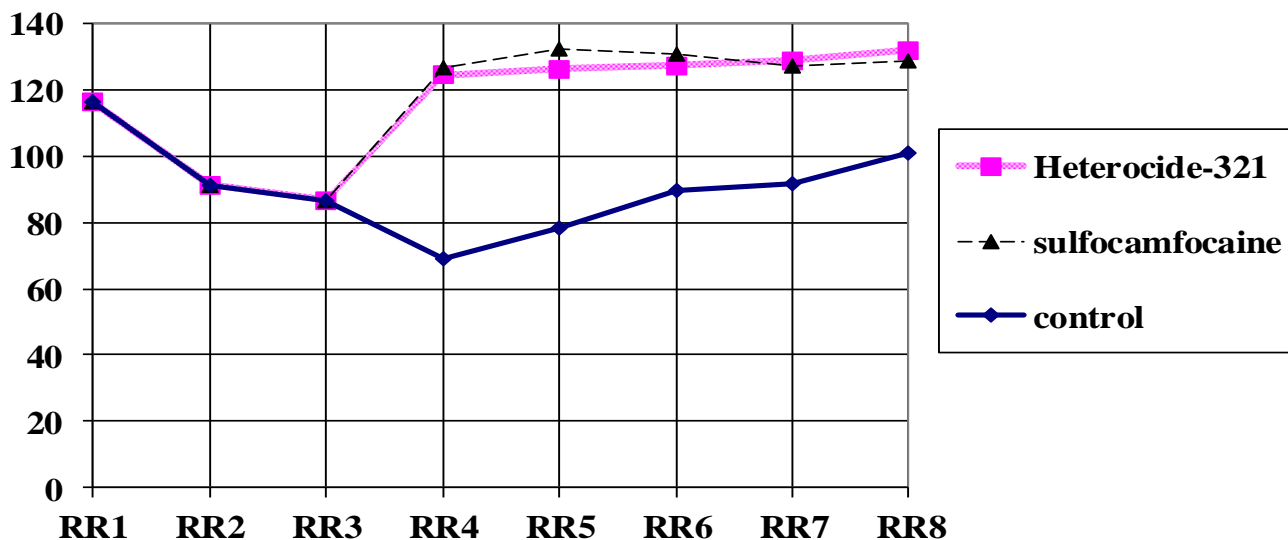


Diagram 1. RR change in the different phases of sleep anesthesia

Conclusions:

1. The studies established the dynamics of RR/min on the background of ketamine anesthesia for Heterocide -321 and sulfokamfokaine (reference drug).
2. One of the mechanisms of antinarcosis action of Heterocide-321 is the activation of the respiratory center of the central nervous system.
3. A sulfur- and nitrogen-containing heterocyclic groups are promising enough to use them for a search for the original analeptic drugs.