3rd WORLD CONGRESS ON
VETERINARY MEDICINE
April 25, 2022 | Webinar

Received Date: 18 February, 2022 | Accepted Date: 22 February, 2022 | Published Date: 29 April, 2022

Acute hypoxic states correction in laboratory animals with antihypoxant Epophen

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Hypoxia is insufficient supply of the body's tissues with oxygen or disorder of its utilization during biological oxidation. One of the types of hypoxia is hypercapnic hypoxia. Hypercapnic hypoxia is an increase of the carbon dioxide partial pressure in the blood, which occurs when there is insufficient oxygen content in the inhaled air. The effect of hypoxia on the body occurs at two levels-the system level and the cellular level. The system level includes: Activation of the sympathicoadrenal and, hypothalamic-pituitary-adrenal systems, Disorder of system hemodynamics, microcirculation, tissue diffusion, hemorheological disorders, Hypoxemia.

Hypercapnic hypoxia can develop in confined spaces, mines, wells, due to malfunction in oxygen supply in aircraft cabins and submarines and in accidents and technogenic catastrophes. Failure of systems that provide atmospheric regeneration in the compartments of spacecraft, submarines, aircraft cabins and sealed military and civil defense structures are the most common situations that lead to the development of hypoxia. In this regard, the relevance of the problem of developing pharmacological drugs for the hypoxia prevention and the treatment of its complications is obvious.

Epophen is a substance with a polyphenolic structure. It prevents the development of lipid peroxidation reactions, stimulates the destruction of peroxidation products. In the posthypoxic period, it promotes rapid oxidation of accumulated restored equivalents-nicotinamide adenine dinucleotide phosphate (NADP, NADPN2), optimizes the mitochondria work o and improves tissue respiration.

Male F1 CBA/Lac × C57/BL/6 mice weighing 23 g were used in the experiments. The animals were divided into 3 groups of 10 individuals per group. The first group of mice received Epophen at a dose of 28 mg / kg and Piracetam at a dose of 120 mg/kg was used as a reference drug. The drugs were dissolved in distilled water and introduced intragastrically in a volume of 0.5 ml to mice 40-60 minutes before hypoxic exposure. Animals in the control group were given an equivalent volume of distilled water.

To simulate acute hypercapnic hypoxia, mice were placed one at a time in hermetically sealed jars with a volume of 300 cm3. After putting the animal in the jar and closing the lid, the start time of the experiment was marked. The criterion for evaluating the antihypoxic effect was the lifetime of mice. The time of death of animals after stopping breathing was recorded.

There was a significant increase in the life time of mice in the groups receiving Epophen by 53.7 % and Piracetam by 40.6 % relative to the control group. The life time of mice received Epophen 13.1% higher than in mice received Piracetam.

The obtained results confirm the presence of pronounced antihypoxic effect of the studied drug Epophen in experiments on mice when modeling hypercapnic hypoxia and allow us to recommend Epophen for the elimination of hypoxia, that develops in extreme conditions (hypoventilation of the lungs, mountain rescue work, underwater work, work at elevated temperatures and work in closed poorly ventilated rooms).

Recent Publications

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Biography

Anastasiya Ovcharova is currently working in All-Russian Research Institute of Physiology, Biochemistry and Animal Nutrition, Russian Federation. Her passion for Veterinary never ends thus she chosen this profession to serve the pets.

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