EFFECT OF SYNTHETIC PYRETHROID DELTAMETHRIN ON GLYCOGEN CONTENT IN MUSCLES OF EXPERIMENTAL ANIMALS

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Glycogen is a form of carbohydrate reserve in organism of mammals, including human. It can be accumulated in large amounts in liver and skeleton muscles. The basic purpose of liver glycogen is supporting glucose level in blood, and muscle glycogen is used only by muscles mainly in conditions, related to insufficient oxygen supply to these organs. A sufficient amount of glycogen in muscles allows animals to adapt to the changing conditions of environment. Scientific literature contains certain data on influence that various classes of pesticides can have upon glycogen contents in organs of different animals, including mammals. At the same time, information on glycogen concentration in muscles of mammals during recreation period after a single introduction of synthetic pirethroids in toxic doses is available.

The objective of this work is to reveal influence of deltamethrin upon dynamics of glycogen content in muscles of experimental animals during one month after a single introduction of the studied pesticide.

For experimental purpose we have formed 8 groups (n = 12) of 96 male rats of Wistar line with body mass 240 ± 10 g. Rats of groups 1, 3, 5, and 7 were control and received saline. Animals of groups 2, 4, 6, and 8 were exposed to a single introduction of deltamethrin into stomach in dose of 17,4 mg/kg of body mass that equals 1/5 L/D_{50}. In order to determine dynamic of glycogen content in muscles, animals were recovered from the experiment by stages: rats of groups 1 and 2 – after one day, groups 3 and 4 – after three days, groups 5 and 6 – after seven days, groups 7 and 8 – after thirty days. During the experiment deltamethrin form under trade mark "Butox 50" ("Intervet", Netherlands) was used. Requirements of European Convention for the Protection of Vertebrate Animals used for Experimental and other Scientific Purposes (Council of Europe No 123, Strasbourg, 1985) were followed during tests and in process of recovering rats from the experiment.

Glycogen was sampled in large thigh muscles according to the method of R.S. Carr and J.M. Neff, 1984. The received digital data was statistically processed with facilitation of Mann-Whitney test. Difference was considered statistically relevant for $p < 0,05$.

Statistical analysis has revealed significant difference in glycogen content between rats of group 2 in comparison to the corresponding control group, their values varied by 40% ($p = 0,0092$). This fact can be caused by neurotoxic effect of deltamethrin that can provoke excessive activation of nervous system that happens along with paroxysm, uncontrolled muscle contraction, and coordination disturbance. All these symptoms result in energy deficit and intensified consumption of muscle glycogen in ATP regeneration. After three and seven days past introduction of deltamethrin deficit of muscle glycogen has become less expressed, but statistically-relevant deviations from control groups remained. Glycogen content in muscles of rats in groups 4 and 6 was lower by 19,6% ($p = 0,0214$) and 19,4% ($p = 0,0403$) correspondingly in comparison with control groups. Regeneration of glycogen content in muscle is complete only after one month past the suffered acute intoxication with deltamethrin.

Thus, the research has revealed that during week 1 after a single introduction of deltamethrin in dose 17,4 mg/kg of body mass a decrease in glycogen content in muscle of experimental animals is observed. Restoration of muscle glycogen level is completed only after one month.

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