

УДК 615.285.7 599.323.4. 611.018.5

DYNAMICS OF HEMATOLOGICAL PARAMETERS OF RATS DURING AN HOUR AFTER CHLORPYRIFOS INTOXICATION

V. Rosalovskyi, S. Grabovska, Yu. Salyha, PhD
ros.volodymyr@gmail.com
Institute of Animal Biology NAAS

Organophosphate compounds (OPs) are derivatives of phosphoric acid. This class of compounds includes esters of orto-, thio-, dithiophosphoric, alkylphosphone, alkylphosphine, and phtorphosphorous acids, and esters, amides and amino esters of pyrophosphoric acid. According to the toxicity rate, OPs are divided into: highly toxic (LD_{50} between 51 and 200 mg/kg), moderately toxic (LD_{50} between 201 and 1000 mg/kg), and low toxic ($LD_{50} > 1000$ mg/kg).

Chlorpyrifos (CPF) is one of the typical OPs. It is a highly effective contact broad-spectrum pesticide. As CPF is used an active compound of many insecticides, it is highly hazardous to affect humans and animals. The main ways of CPF exposure to human are inhalation, transdermal absorption and *per os*. CPF absorption starts in the mouth, and then continues in stomach and intestines. Due to the high lipotropism, it soon appears in the blood. About 30 % of CPF excretes by kidneys, and 20–25 % by the respiratory tract. The main toxic effects of CPF are connected with its anticholinergic activity, but there are data indicating the existence of other mechanisms of its toxicity.

The aim of our work was to study alternations of hematological parameters of rats' peripheral blood on 15, 30, 45 and 60 minutes after single oral exposure of CPF. We used 5 groups of adult Wistar rats of similar weight and age: 1 control and 4 experimental groups. Experimental animals were exposed orally to 30 mg/kg CPF, and blood samples were obtained after 15, 30, 45 and 60 minutes, respectively. Samples were analyzed with automatic hematologic analyzer Orphée Mythic 18 (Switzerland), no later than 2 hours after sacrifice.

We observed changes in some hematological parameters of peripheral blood. So, in the first experimental group there was a statistically significant ($p < 0.05$) increase in the total number of leukocytes, lymphocytes, monocytes, granulocytes, that has a tendency to decrease in other groups, as compared to control. There was inversely proportional connection between platelet number and duration of the experiment; mean platelet volume increased slightly in the second and third groups. There was also found a decrease in the number of red blood cells in animals of the third and fourth groups, accompanied by a simultaneous haematocrit decline in these groups.

Thus, it is shown that, after a single oral CPF exposure, maximum increase in the total number of white blood cells occurs in the first 15 minutes of the experiment. The same trend was observed for the total number of lymphocytes, monocytes and granulocytes. The lowest platelet count was observed at 60th minute of experiment. Also, we noted a reduced average platelet volume at the 60th minute, but it was below the significance. A significant increase in the total number of red blood cells was observed at 15th minute of experiment, with a gradual decrease up to 60th minute.