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Inhibition of the medicines hemolysis by liposome

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Currently, there are no specific medicines for inhibiting hemolysis, especially on the basis of lipids. We have previously shown that negatively charged liposomes prepared on the basis of polar lipids prevent complement-induced hemolysis [1].

The purpose of this work was research of an opportunity of inhibition by liposomes hemolysis caused by action of the medicines applied to treatment of infections transferred sexual by and diseases of a skin.

Liposomes were used on the basis of egg phosphatidylcholine ("Pharmstandard-Biolik», Ukraine) and negatively charged liposomes with original lipid structure developed by Ivanova N. N. As damaging agent were used the following drugs: cefaclor (cephalosporin antibiotic), metronidazole, benzylpenicillin. The experiments were held on model systems (sheep erythrocytes) and on the blood of volunteers, patients with various types of dermatoses, including allergies to medicines. Hemolysis test of red blood cells were assayed on spectrophotometer at 418 nm wavelength. Liposomes have been added (in different concentration) to sheep erythrocytes or to blood of patients, the medicines causing hemolysis have simultaneously been added. After incubation 1 hour at temperature 36,6 °C determined the degree of hemolysis in view of optical density of liposomes.

In the course of in vitro studies identified concentration of drugs causing hemolysis. The antihemolytic activity of liposomes based on lecithin and on the basis of negatively charged lipids was tested. Determined that:

- While adding to sheep erythrocytes negatively charged liposomes and antibiotic Cefaclor hemolysis of erythrocytes decreased in 5 times (from 15% to 3%);
- Liposomes on the basis of egg phosphatidylcholine inhibited of sheep erythrocytes hemolysis caused by metronidazole, hemolysis percentage dropped 3 times. The Negatively charged liposomes reduced of sheep erythrocytes hemolysis from 13 % up to 0 %;
-Hemolysis of sheep erythrocytes caused by the action of benzylpenicillin was reduced by adding the negatively charged liposomes in 6 times.

In the inhibition of donor erythrocytes hemolysis caused by the action of metronidazole and benzylpenicillin in vitro, similar results were obtained.

The data obtained suggests the advantage of using liposomal forms of the medicines causing varying degrees of hemolysis of red blood cells.

1. *Ivanova N.N., Kaplun A.P. , Krasnopolskiy Yu.M., Temirov Yu.P. and Shvets V.I.* "Complement can be inhibited by charged substances"// In the boor of abstracts "43rd International Conference on the Bioscience of Lipids", Austria, on September, 11-14th.- 2002.