Application of polymeric drug carriers in a form of implants will allow to obtain prolonged in time drug delivery into an exactly defined place. However, application of biodegradable or resorbable polymers will let to obtain such a drug form which will not require another surgery. The aim of the study was to evaluate the influence of gelatin-alginate matrixes on morphotic blood elements and blood proteins in vitro.

Four kinds of gelatin-alginate matrixes in a form of a sponge prepared at Department of Applied Pharmacy of Medical University of Wroclaw were used in the study. In order to obtain a form of sponge a liofilization of foam originated from foaming of mixture of sterile solution of gelatin (20%), sodium alginate (2% or 4%) and glycerol (3% or 5%) selected in an appropriate ratio was performed.

Human blood preserved in citrate was used in the study. Hemolytic action of sponges was assessed by measure of hemolysis rate, serum hemoglobin concentration and evaluation of morphotic blood elements. Hemolysis rate was assayed after incubation of studied matrixes in chloride natrium and contact with erythrocytes. Serum hemoglobin concentration was assayed after incubation of blood with gelatin sponges. Blood smear was used in order to evaluate morphotic blood elements. Sponges haemostatic action was evaluated by assay of blood recalcination time after incubation with matrix at 37°C over 15, 30 and 60 minutes and tests of the coagulation system after incubation of serum at 37°C over 15, 30, 60 and 120 minutes.

Following indicators were assayed: activated partial thromboplastin time (APTT), prothrombin time (PT), thrombin time (TT) and fibrinogen concentration (Fb). Simultaneously samples which did not have contact with sponges were evaluated as controls. Results were analyzed by use of Statistica 5.5 software assuming the level of significance of p<0.05, p<0.01 and p<0.001.

Mean value of hemolysis rate, no matter kind of matrix, did not exceed normal values. Fibrinogen concentration was in range of values measured in control group. Blood smear morphotic of elements were normal and comparable between studied sponges. Studied sponges shorten significantly recalcination time (p<0.001). After contact with a sponge APTT was prolonged and significantly (p<0.001) longer in comparison to controls. However, APTT in both groups was in normal range. Prothrombin time (PT), thrombin time (TT) and fibrinogen concentration (Fb) in all measures were comparable and did not differ from controls. During the study gelatin-alginate matrixes were in solid form in study environment only for a short period of time (15 minutes).

All results lead to a conclusion that all studied gelatin-alginate matrixes in a form of sponges do not have hemolytic features and they activate the coagulation system. The shortest recalcination time and the smallest changes in serum coagulation system were observed in sponges with high sodium alginate concentration.

Key words: gelatin-alginate matrixes, hemolytic action, coagulation system activation