

There is a close relationship between coagulation and inflammation based on positive feedback. Activation of clotting stimulates the development of inflammation, as well as inflammation activates intravascular coagulation. Previous studies have shown that acute pancreatitis is associated with local disturbance of blood flow in pancreatic microcirculation and activation of coagulation. In mild acute pancreatitis, activation of coagulation may be limited to intravascular thrombosis in pancreatic vessels, but severe acute pancreatitis may lead to the development of disseminated intravascular coagulation (DIC).

Previous studies have also shown that administration of heparin exhibits the anti-inflammatory and antithrombotic effect in acute pancreatitis leading to the inhibition of the development of this inflammation and accelerates the recovery in this disease. Similar beneficial effect in acute pancreatitis was found after administration of acenocoumarol, a vitamin K antagonist. There, the aim of current research is to determine the influence of clotting modification by administration of anticoagulants on the development and course of experimental acute pancreatitis induced by pancreatic ischemia and reperfusion.

Modification of the coagulation system will be reached by administration of dabigatran (thrombin inhibitor) and rivaroxaban (inhibitor of active factor X). Dabigatran and rivaroxaban are used, inter alia, in the prevention of deep vein thrombosis, pulmonary embolism and atrial fibrillation. The study will be performed on Wistar rats. Acute pancreatitis will be induced by pancreatic ischemia followed by reperfusion.

The research will be carried out two series. In the first series of studies, the tested compounds will be administered before induction of acute pancreatitis, which will allow checking their protective effect on the pancreas. In the second series of studies, the tested compounds will be given after induction of acute pancreatitis. It will allow determining their influence on regenerative processes occurring in the course of acute pancreatitis. In addition, the proposed studies will allow determining the impact of the tested compounds on the activity of pro- and anti-inflammatory factors in basic conditions and in acute pancreatitis. The activity of the coagulation system will be also assessed.

The aim of the study will also be to determine the impact of used compounds on the development of oxidative stress and the activity of antioxidant mechanisms. An important part of the research will also be the assessment of the effect of the studied factors on the pancreatic cell viability and their proliferative capacity and the level of pancreatic blood flow. Planned study is the innovative research and has not been carried out yet. The place where research will be carried out and the scientific experience possessed by contractors and the possibility of international cooperation guarantee high quality of study.

The realization of the planned research will provide new information on the relationship between the activity of the coagulation system and inflammation, and will allow a better understanding of the pathophysiology of inflammatory processes. The innovative nature of research also guarantees that the results obtained will be presented at prestigious scientific conferences and will be published in prominent scientific journals with a high impact factor.