Atherosclerosis is a civilization disease, which pathophysiology is based on chronic inflammatory response in wall of vessels that is caused by increase of proinflammatory substances. It is significant challenge for diagnostics and pharmacology. This disease occurs in over 60% of population over 70 years old. There are many factors which are responsible for this process including group of the arachidonic acid metabolism products – leukotriens, especially leukotriene E4 (LTE4). The effect of these factors was described as base of pathology not only cardiovascular diseases but also the base of development of asthma and other allergic diseases. The substance which blocks activity of these factors – montelukast - is a common method of treatment in asthma.

The aim of this project is to investigate the influence of cysteinyl leukotriens receptor antagonists on lower limbs arteries reocclusion rate in patients with peripheral artery occlusive disease (PAOD) after endovascular treatment.

During previous years we conducted a prospective study, which helped us evaluating the dynamics of leukotriens and tromboxane levels in patients with PAOD, who underwent endovascular treatment – peripheral transluminal angioplasty (PTA). We established for the first time the dependence between the increased level of uLTE4 and restenosis or reocclusion occurrence, which translates to the necessity of further procedures and decrease of the quality of life. We should ask ourselves a question: Is blocking of cysteinyl leukotriens reaction as proinflammatory and proliferative factors, by the use of receptor CysLT1 antagonists going to decrease the quantity of restenosis and reocclusions after endovascular treatment?

Within the project performed in Angiology Department of Jagiellonian University among the patients suffering from PAOD and fulfilling all inclusion criteria, the randomized double-blinded clinical study will be performed. Patients will be assigned to two groups: Treatment Group (which will be receiving cysteinyl leukotriene antagonist (montelukast) in dose of 10mg/day for 12 months) and Control Group to which placebo will be administered. Among all patients population, at every visit at 1., 3., 6., and 12 month clinical state, ultrasound, hemodynamic parameters and endothelium imaging will be performed as well as uLTE4 measurements. Comparison of the results between both groups will give us an answer if blocking uLTE4 receptors may become a breakthrough in future atherosclerosis treatment.

The mechanisms, which leads to restenosis is still not fully understood, and currently used methods of treatment – antiplatlets, anti-proliferative drugs and anticoagulants - are not fully effective. Thanks to this research the knowledge about treatment and prevention of atherosclerosis will be increased, which will be connected with future better patients care, especially patients with PAOD. The results of our study will be published in high impact factor journals and will be presented during many prestigious polish and international conferences and congresses, and hence promoting polish science on international stage