Atherosclerosis, a chronic disease of inflammatory process in wall of vessels, is caused by increase of proinflammatory substances and remains one of the greatest issues for modern diagnostics and pharmacology. Its occurrence in over 60% of geriatric population and fact that it is not limited only to coronary arteries but affects almost every single artery type and location makes it even more challenging. What is more, it has been proven that the rate of adverse vascular events in patients suffering from coronary artery disease (CAD) combined with peripheral artery disease (PAD) is much higher compared to patients with only single-level atherosclerosis. In patients with critical lower limbs ischemia due to PAD the rate of complications is even higher, mostly because of arterial thrombosis episodes. Both processes, inflammation and thrombosis are concerning the dysfunctions of arterial endothelium, which mechanism, in case of peripheral limb complications, is still unexplained.

The goal of our project is to assess the relationship between thrombo-inflammatory processes and the occurrence of major adverse cardiovascular and limb events in patients treated endovascular due to critical lower limb ischemia in course of multi-level arterial disease.

Into this prospective observational project performed in Angiology Department we will enroll 75 patients suffering from multilevel atherosclerosis, defined as critical lower limbs ischemia due to PAD and accompanied by CAD. The control group will consist of 75 patients with CAD, but without symptomatic PAD. In both groups the wide inflammatory and prothombotic biomarkers panels will be examined. All participants will be covered with 1., 3., 6., 12. and 18-month follow-up meetings including clinical state, ultrasound, hemodynamic parameters, endothelium imaging and quality of life assessment. What is more, at 1-year visit the blood samples will be collected from which the biomarkers selected from the panels will be additionally examined. Comparison of the level of biomarkers and occurrence of major adverse cardiovascular and limb events may help explaining the causes of high rate of such complications in patients with multilevel atherosclerosis.

The exact mechanisms, leading to limb and cardiovascular complications are still the subject of the debate, and currently used methods of treatment –anti-proliferative and anti-platelet drugs combined with anticoagulants - are not fully effective. The results of this research will help to expand the knowledge those mechanisms leading to developing new pathways of preventing and treating patients with PAD combined with CAD. The results of our study will be published in high impact journals and will be presented during prestigious polish and international conferences and congresses.