Examination of exercise induced limb ischemia in peripheral artery disease from a hemorheological point of view

David Kovacs1, Beata Csiszar1, Katalin Biro1, Katalin Koltaı̈1, Dora Praksch1, Kinga Totsimon1, Dora Endrei1, Kalman Toth1, Gabor Kesmarky1
11st Department of Medicine, Medical School, University of Pecs

Aim: Our aim was the investigation of microcirculatory blood flow by angiological as well as hemorheological methods in patients with peripheral artery disease (PAD).

Methods: The patient group was made up of 35 patients diagnosed with PAD (66±2 yrs; 17 women, 18 men) and 21 healthy volunteers without PAD were enrolled as control group (60±3 yrs; 12 women; 9 men). Transcutaneous tissue oxygen pressure, laser Doppler flowmetry were applied. Exercise test (6-minute walk test or treadmill) was performed as provocation; measurements were done at rest and after exercise. Examination of hemorheological parameters (fibrinogen, plasma and whole blood viscosity, red blood cell (RBC) aggregation) was also studied.

Results: All the measured angiological parameters were significantly worse among patients compared to the control group (p<0.05). Higher fibrinogen level (p<0.001) and RBC aggregation (p<0.05) were detected in patients with PAD compared to the control group. The RBC aggregation and plasma viscosity were more deteriorated in patients with claudication than in asymptomatic patients (p<0.05). The maximal and pain-free walking distances of treadmill tests had negative correlation with RBC aggregation and plasma viscosity (p<0.05).

Conclusion: These findings suggest that certain impaired hemorheological factors may contribute to the altered functional capacity by the deterioration of microcirculation in PAD.