Hemorheological disturbances in chronic carotid artery stenosis

Kinga Totsimon¹, Alexandra Nagy², Barbara Sandor¹, Katalin Biro¹, Arpad Csatho², Laszlo Szapary³, Csenge Lovig³, Peter Csecsei³, Kalman Toth¹, Zsolt Marton¹, Peter Kenyeres¹  
¹1st Department of Medicine, Medical School, University of Pecs, Hungary  
²Department of Behavioral Sciences, University of Pecs, Medical School, Hungary  
³Department of Neurology, University of Pecs, Medical School, Hungary

Aim: Prior researches suggest that hemorheological parameters are altered in CAS and in chronic cerebrovascular disorders as well, but it is controversial if hemorheological parameters could be markers of the extent of stenosis or atherosclerosis. We investigated the connection among between hemorheological parameters, stenosis and atherosclerosis both in symptomatic and asymptomatic cerebrovascular patients.

Methods: 107 patients were investigated (mean age 64±6 years), 40% of them had cerebrovascular events in the case history and 48% had CAS (>50% in diameter). Routine lab parameters were determined and hemorheological variables were measured: hematocrit, plasma (PV) and whole blood viscosity (WBV), red blood cell aggregation, and deformability.

Results: In the stenotic group WBV and red blood cell aggregation were higher than in the non-stenotic group (p<0.05). WBV and PV were increased and red blood cell deformability was decreased in the symptomatic group compared to the asymptomatic group (p<0.05). PV and red blood cell deformability were altered in the evolving atherosclerosis group and the CAS groups compared to patients having no signs of stenosis (p<0.05), but there was no difference among the CAS groups.

Conclusion: Although hemorheological factors are altered both in CAS and chronic cerebrovascular disorders, the severity of stenosis cannot be detected based on these parameters, but these factors could refer to the presence of atherosclerosis.