Hemorheological Parameters in Different Forms of Coronary Heart Disease

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In the coronaries there is a continuous change in blood flow, perfusion pressure and shear rate during each cardiac cycle. It is also the place of the narrowest capillaries in the human body, therefore the role of rheological alterations is of great importance here.

Over the last few decades, we have investigated hemorheological parameters (HP) in over 5,000 patients diagnosed with various forms of ischemic heart disease (IHD). In a prospective study, we measured the HP of patients with acute coronary syndrome (ACS). On admission, all variables were significantly worse than those of control subjects. During the hospital phase, some of the HP showed further deterioration, and HP remained in the pathologic range during the follow-up period. In two other studies we showed that HP were in close correlation with the severity of coronary artery disease which had been detected by coronary angiography and coronary CT. In patients treated with percutaneous coronary intervention, changes in HP were very similar to those observed in subjects with ACS. We also analyzed HP in patients undergoing CABG surgery. Our data suggest a hemorheological advantage of off-pump surgery.

In IHD patients during ambulatory cardiac rehabilitation HP showed a significant improvement during the 1.5 year follow-up period.

Our data indicate that rheological parameters are significantly altered in patients with IHD: the extent of the alterations is in a good correlation with the clinical severity of the disease.