Rheologic behavior of blood in some myeloproliferative neoplasms

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AIM: The aim was to investigate rheological behavior of blood in patients with some myeloproliferative neoplasms.

METHODS: The study included 16 adults with Polycythemia vera (PV), 42 young with acute lymphoblastic leukemia (ALL), and 67 healthy donors as control group. Of patients 38% had thrombosis. Using rotational viscosimeter whole blood viscosity (WBV) were measured in order of a decreasing and then of an increasing of shear rates with subsequent calculations for erythrocyte aggregation, and erythrocyte deformability, and non-Newtonian behavior of blood. Hematological parameters and erythrocyte indices and B-type natriuretic peptide (BNP) were analyzed simultaneously.

RESULTS: Increased WBV revealed in PV but not in ALL. In patients WBV had differences when it was measured in order of decreasing and then of increasing of shear rates. Patient’s WBV dependent on leukocytes count, on MCH and mainly on MCV. Both neoplasms are accompanied increased erythrocyte aggregation but not impaired erythrocyte deformability. Of patients 40% had elevated BNP assuming subclinical cardiac dysfunction that lead to non-fully reversible erythrocyte aggregation. The residual cells units play role in that in PV-patients non-Newtonian behavior of blood is lost later than in ALL-patients and in control group.

CONCLUSION: Patients with some myeloproliferative neoplasms has abnormal blood flow properties forming non-hemocoagulation conditions for thrombosis development.