Blood rheology during normal pregnancy – results of a single center investigation

v. v.Tempelhoff G.-F, Schelkunov O.1; Niesigk B.2; Demirhan A.1; Csorba R.2; Tsikouras P.3
1Department of Gynecology and Obstetrics, St. Vinzenz Hospital Hanau
2Department of Obstetrics and Gynecology, City Hospital of Aschaffenburg
3Democritus University of Thrace, Department of Obstetrics and Gynecology

Pregnancy goes along with an increase in plasma viscosity (Pv) and Erythrocyte aggregation while little is known about Red Blood Cell (RBC) deformability.

In a total of 1.275 consecutive pregnancies blood rheological parameters were investigated longitudinally and results were compared with those from 126 age-matched non pregnant women.

Compared to controls (1.15±1.15 mPas) Pv was moderately but significantly higher in the 3rd trimester (1.19±0.1 mPas; p=0.01) while Erythrocyte aggregation (stasis/low shear) was markedly higher during each trimester (means: 18.96/23.89; 20.0/27.49 and 19.1/28.65) compared to the controls (11.95/16.94; p<0.001). During 2nd trimester Erythrocyte deformability was significantly lower for all shear stress conditions and although increased during 3rd trimester remained lower as in the controls. RBC deformability is correlated with gestational age (r=0.13; p<0.001), MCV and MCHC which was most pronounced under high shear rate conditions while an inverse correlations was found with MCH.

Along with physiological hemodilution a trend towards hyper viscosity exists for each blood rheological parameter, whereas RBC deformability temporary decreases during 2nd trimester while improves towards the end of pregnancy.