## 303 EFFECT OF pH AND OSMOLALITY ON THE DEFORMABILITY OF DENSITY SEPARATED RED BLOOD CELLS.

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1.5 µl of unfractionated and density-separated red blood cells (RBC) of healthy adult donors were suspended in Dextran-70 buffer solutions (32cP) at different pH-values (range: 6.9 to 8.0) and osmolalities (range: 200 to 600 mmol/kg). The RBC elongations were measured by a Rheoscope at different shear stresses and evaluated semiautomatically.

Results:

1. Acidosis did not impair RBC deformability in any of the fractions.
2. Alcalosis caused a slight decrease in the deformability of non-fractioned RBC, whereas the deformability of aged RBC fell markedly. The young RBC remained uneffected.
3. Hyposmolality moderately increased the deformability of young cells. This increase in deformability was more pronounced for non-fractionated and aged RBC.
4. Hyperosmolality significantly reduced RBC deformability, especially in the non-fractionated and aged RBC population.

We conclude that young RBC withstand severe alcalosis or hyper-osmolality better than aged RBC.

## 304 IN VITRO TECHNIQUES FOR THE ESTIMATION OF RBC AGGREGATION

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Red blood cell (RBC) aggregation induced by fibrinogen is a major determinant of the non-Newtonian flow behavior of blood and has been suggested as a possible contributing factor for disturbed microcirculatory flow and thrombogenesis. The purpose of the present investigation was to evaluate several experimental measures of RBC aggregation in order to determine their ability to differentiate between groups with low (25 neonates), normal (35 adult controls), and high (59 pregnant women, 24 nephrotic syndrome) fibrinogen levels. The following aggregation measures were employed: 1) Microscopic Aggregation Index (MAI); 2) Zeta Sedimentation Ratio (ZSR); 3) Aggregation Half Time (AHT) after cessation of shear; 4) Relative Light Transmission (RLT) after 1 and 1o minutes of stasis; 5) shear rate at Minimum Light Transmission (MLT); 5) Myrenne Erythrocyte Aggregation(MEA). All methods were able to distinguish aggregation between low and normal fibrinogen levels ($p < o.o1$) although the AHT, MLT and MEA present technical difficulties at low levels. At high fibrinogen levels, only the MAI method failed to show a difference from normal levels ($p > o.o5$). Only MAI and RLT were able to discriminate between sub-groups at the low fibrinogen level and both MAI and MLT became insensitive to fibrinogen concentration at high levels. Thus, the use of only a single measure of RBC aggregation can be misleading, especially where it is desirable to detect differences between sub-groups of patients.