Hemorheological behavior in sickle cell disease pediatric patients

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AIM: Sickle cell anemia is a pandemic disease responsible for several clinical complications including vaso-occlusive events (VOCs). The mechanisms underlying these complications are still not well understood, especially in children. We investigated the hemorheological parameters of sickle cell disease pediatric patients (SCD-PP).

METHODS: We analyzed 28 healthy controls (6.75±4.2 years-old) and 36 homozygote SCD-PP (11±6.2 years old) in order to study their hemorheologic pattern. We use a Haake Rotovisco CV100-RV20 following the ICSH guidelines. RESULTS SCD-PP show higher high-shear rate blood viscosity (ηB200C) and erythrocyte stiffness (Tk) than healthy controls, while we did not detect ηP differences between the two groups. No correlation between the severity of the anemia and the rheological behavior was detected. However, pathological values returned to a normal range strictly after acute blood transfusion therapy.

CONCLUSION: These results confirm the hypothesis that SCD-PP have altered hemorheological behavior. The increased Tk in SCD-PP could lead to alterations of the microcirculatory flux (flow) which are not influenced by the presence of plasmatic proteins or by the severity of the anemia. Moreover, our results suggest that transfusion therapy may be useful for normalizing hemorheological parameters.