

Impact of circulating erythrocyte-derived microparticles on coagulation activation in sickle cell disease

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Background: Sickle cell disease (SCD) is characterized by a hypercoagulable state as a result of multiple factors, including chronic hemolysis and the presence of circulating cell-derived microparticles (MP). The cellular origin of such MP and the exact mechanism by which it enhance coagulation in SCD are not fully understood.

Objective: The study aimed to clarify the presence of circulating erythrocyte-derived MP in SCD patients during painful crisis and in steady state and the impact of these MP on coagulation activation and fibrinolysis.

Methods: Peripheral blood samples from 25 SCD patients during painful crisis and in steady state were studied for the presence of erythrocyte-derived MP using flowcytometry. Estimation of D-dimer level as a marker of coagulation activation was done using semiquantitative assay. 36 healthy individuals, age and sex matched, were included as a normal control group.

Results: The level of erythrocyte-derived MP was significantly higher in SCD patients during crisis compared to the control group ($p=0.02$), but no statistically significant difference was found between erythrocyte-derived MP level in SCD in steady state and the normal controls or between SCD patients during crisis and in steady state, $p=0.03$ and $p=0.49$, respectively. D-dimer level was higher in SCD patients both during crisis and in steady state compared to normal controls ($p<0.001$).

Conclusion: SCD is associated with increased levels of erythrocyte-derived MP which may contribute to the hypercoagulable state observed in such group of patients.

Key words: Coagulation activation, D-dimer, Erythrocyte-derived microparticles, Sickle cell disease

Biography

Rania Zayed is an Assistant Professor of Clinical and Chemical Pathology, Faculty of Medicine, Cairo University, Egypt. She completed the doctorate degree at the age of 31 and is an imminent member of the hematology department team. She has shared in several national and international conferences on hematology and stem cell research.

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