Sickle cell disease a model of cardiovascular risk and new therapeutic targets

Manuel Bicho¹
¹Genetics Laboratory and Environmental Institute of Health, FMUL

Aim Sickle cell diseases (SCD), as well as other hemolytic monogenetic anemias are accompanied by endothelial dysfunction and low grade inflammatory state progressing to advanced cardiovascular diseases in several organs and systems (stroke, pulmonary hypertension, proliferative retinopathy and thrombophilia).

SCD represents a unique opportunity to study the role of the interactions and crosstalk’s between the erythrocytes, leukocytes, platelets and endothelial cells as an mechanism of disease of complex cardiovascular diseases. The most studied pathway is that of nitric oxide, in its several components of the metabolism. Methods One strategy is to study functional polymorphisms of genes such an HBA, HBB cluster, eNOS, ARG, HMOX-1, MPO, ACE and Hp and relate its genetic variation with hematologic and biochemical parameters in blood components also commonly studied in cardiovascular complex disorders (hypertension, diabetes, preeclampsia, heart failure, chronic kidney disease).

Results With this approach we can discover some mechanistic relationship between those polymorphisms and intermediate phenotypes common to those diseases. This permits pharmacogenetic target the variant proteins with precursors of NO (Arginine, citrulline and nitrites).

Conclusion Monogenetic diseases of the erythrocyte can to understand the mechanisms of multifactorial cardiovascular diseases and primarily and secondarily prevent them with nutraceuticals and medicines.