FP808 EARLY IDENTIFICATION OF SICKLE CELL NEPHROPATHY IN A COHORT OF CHILDREN WITH SICKLE CELL DISEASE

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INTRODUCTION: Sickle cell nephropathy (SCN) is a common complication in patients with sickle cell disease (SCD), and the incidence of renal failure increases as patients survival improves. Creatinine-based estimated glomerular filtration rate (eGFR) is usually employed to assess kidney function in patients with SCD, even if its reliability is questionable. A threshold of 30 mg/die for significant microalbuminuria (MAU) is generally used in clinical practice. Nevertheless, children with SCD have an increased tubular secretion of creatinine, leading to a possible underestimation of albuminuria/creatininuria measurements; moreover, levels of MAU<30 mg/die have been associated with high risk for cardiovascular morbidity and mortality in different populations. Early identification of renal abnormalities in patients with SCD is crucial in order to build up strategies for prevention of progressive organ dysfunction.

METHODS: We performed an observational cohort study to assess the prevalence of renal abnormalities and their association with clinical parameters in a population of 60 clinically stable children of West African descent with SCD (genotypes both HbSS and HbSC). We measured serum creatinine, serum cystatin C, MAU, proteinuria/creatininuria (P/C), urinary NGAL and urinary osmolarity. We estimated GFR through the following formulas: Schwartz 2009, Zappitelli cystatin C (CysC), Zappitelli creatinine + cystatin C (crea/CysC). We divided the population in two groups, using as a threshold the presence of MAU>10 mg/g-creatinine. We compared groups for clinically significant variables, and performed a logistic regression in order to identify factors associated with the presence of MAU>10.

RESULTS: Mean age was 10.85 years in our population, and 60% of patients had HbSS genotype. Forty-five percent of patients had a MAU>10, 12.73% had MAU>30 and 5% of patients had P/C>0.3. The three formulas used to estimate GFR yielded significantly different results in our population (mean eGFR: Schwartz 2009 144.4 ± 4.94 ml/min, CysC 109.6 ± 3.41 ml/min, crea/CysC 135.5 ± 4.17; p<0.0001, ordinary one-way ANOVA test). Patients with MAU>10 had significantly higher eGFR with Cystatin C based formulas when compared to patients with MAU<10. A significantly higher percentage of patients with MAU>10 carried the HbSS genotype (80%, p 0.03) and had been treated with hydroxyurea (HU) for more than one year (76%, p 0.03). Logistic regression identified at univariate analysis several factors associated with a significantly higher relative risk of MAU>10: HbSS genotype (p 0.025), higher eGFR with CysC (p 0.027) and crea/CysC (p 0.024) formulas, treatment with HU for more than one year (p 0.03). In a multivariate analysis (adjusted for age and sex) only male sex appeared protective for MAU>10 (RR 0.183, 95% CI 0.036, 0.933).

CONCLUSIONS: We report a high prevalence of MAU>10 (almost 50%) in a population of SCD children; the prevalence of MAU>30 and overt proteinuria were 13% and 5% respectively in our population, in line with previous literature findings. We encountered substantial differences between formulas used to estimate GFR, highlighting an urgent need for comparison with measured GFR in order to definitely establish the most suitable approximation. Patients with MAU>10 had higher eGFR and were more likely to carry the HbSS genotype, suggesting a protective role for HbSC genotype for SCN; also, they were more likely to have received prolonged treatment with HU, indicating a worse disease phenotype in this subpopulation.