

**THE PREVALENCE AND PRESENTATION OF HYPOSTHENURIA AND
PROTEINURIA AMONG ADOLESCENTS AND ADULTS ATTENDING THE SICKLE
CELL CLINIC IN MULAGO HOSPITAL**

SUBMITTED BY:

SIMON ELEKU (MBCHB- M.U.K)

SUPERVISORS:

**PROF. CHRISTOPHER NDUGWA (Department of Pediatrics, Makerere
University)**

**DR. SSEKASANVU EMMANUEL (Consultant Physician, Mulago
Hospital Complex)**

**A DISSERTATION SUBMITTED AS PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE
(INTERNAL MEDICINE) OF MAKERERE UNIVERSITY**

ABSTRACT

Introduction:

The presentation of SCD nephropathy is varied ranging from asymptomatic to include a defect of urine concentration, abnormal proximal and distal tubular function and nephrotic syndrome to overt renal failure.

The prevalence of sickle cell complications including nephropathy is expected to increase owing to more and more patients surviving to adulthood.

The prevalence and presentation of hyposthenuria and proteinuria among Ugandan patients has not been previously published.

Objective:

To determine the prevalence, describe clinical presentations, factors associated with hyposthenuria and proteinuria among adolescents and adults attending the sickle cell clinic in Mulago Hospital

Design: Descriptive cross sectional study with an analytical component.

Setting: Sickle Cell Clinic at Mulago National Referral Hospital. Study period (February – April 2005)

Patients: A total of 1243 patients were screened, 237(19.1%) patients satisfied the inclusion criteria and were recruited consecutively; 1006 patients were excluded (Five were HIV positive, 28 had fever, 10 had dysuria and urethral discharge while six females were in menstrual period and the rest aged < 12 years).

Male: Female = 1:1.2. Females were 127 (54.6%) with majority of the patients 159 (67%) being adolescents.

Measurements: Selected features of kidney disease in the history, clinical evaluation and laboratory investigations (Hemoglobin, renal function tests, serum electrolytes and urinalysis). GFR was calculated using the Cockcroft- Gault method.

Main results: The prevalence of hyposthenuria and proteinuria was 28.3% and 15.6% respectively. 5.5% had both hyposthenuria and proteinuria. History of nocturia ($p=0.037$) and enuresis ($p=0.023$) reached statistical significance for hyposthenuria. Also patients with high GFR ($p=0.001$) were more likely to have hyposthenuria.

Mean diastolic blood pressure of patients with proteinuria was significantly higher than that of patients without proteinuria ($p=0.019$).

Age and sex were not predictive of hyposthenuria or proteinuria; ($p=0.057$) and ($p= 0.236$) respectively. Similarly no significant effect was exerted by painful crisis on either hyposthenuria ($p=0.076$) or proteinuria (0.057) but hyposthenuria was more likely in patients with anemia ($p=0.038$) where as proteinuria was more likely in patients with low Hb ($p=0.001$).

The final logistic regression model for hyposthenuria contained two significant variables: hemoglobin (OR 1.9, CI=1.11-3.25) and enuresis (OR 2.4, CI= 1.06-5.43). The final regression model for proteinuria also had two significant variables: Hb with negative association (Hb: 0-5; > 5-8; > 8 OR 0.33, CI= 0.17-0.64) and diastolic blood pressure (OR 1.04, CI= 1.00-1.07).

Conclusions:

1. This study has revealed that the prevalence of hyposthenuria among adolescents and adults at the Sick Cell Clinic is 28.3%; proteinuria is less common than hyposthenuria with a prevalence of 15.6%. Co- occurrence of both is low (5.5%).
2. Nocturia and enuresis are important predictors of hyposthenuria. The only clinical examination finding significant for proteinuria is diastolic blood pressure.
3. High GFR is an important indicator of hyposthenuria.
4. Age, sex and painful crisis were not found to significantly predict the presence and absence hyposthenuria or proteinuria.
5. Low hemoglobin was significantly related to hyposthenuria and proteinuria. Patients with high hemoglobin are less likely to have proteinuria and low Hb may indicate presence of hyposthenuria.

Recommendations:

Hyposthenuria and proteinuria are the earliest manifestations of sickle cell kidney disease. Proteinuria is also a dominant risk factor for deterioration in most renal diseases including sickle cell renal disease. It there imperative to evaluate sickle cell kidney early by;

1. Evaluating for hyposthenuria through seeking clinical features like nocturia, enuresis, low hemoglobin and GFR more than the normal to suspect the presence of hyposthenuria and elevated diastolic blood pressure and low hemoglobin are suggestive of proteinuria.
2. Further research in the area of renal disorders (hyposthenuria and proteinuria) among sickle cell patients in Uganda is required.