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CLINICAL & BASIC RESEARCH

The Role of Hyposthenuria in Enuresis Among Paediatric Patients With Sickle Cell Disease

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Abstract: *Objectives:* Enuresis is common among children with sickle cell disease (SCD). Many risk factors have been postulated, but its relation to hyposthenuria is debatable. This study aimed to determine the prevalence of enuresis in children with SCD in Basrah, Iraq, and to examine its relation with hyposthenuria. *Methods:* A cross-sectional epidemiological study was performed on children with SCD who met the inclusion criteria at the Basrah Center for Hereditary Blood Diseases from December 2020 to May 2021. A questionnaire was used to collect relevant data. Blood samples were tested for haemoglobin genotype, certain blood indices and serum haemoglobin. Urine was tested for albumin and creatinine, and the specific gravity was measured using urine dipsticks. The relationships between enuresis and various sociodemographic and clinical variables were assessed. Binary logistic regression analysis was done to examine the independent risk factors of enuresis. *Results:* A total of 161 out of 200 eligible children were included in this study (response rate: 80.5%). The majority of participants (60.9%) were males. The mean age of the participants was 10.9 ± 2.9 years. Enuresis was reported in 50 (31.1%) patients. The independent risk factors for enuresis included family history of enuresis (adjusted odds ratio [OR] = 5.94, 95% confidence interval [CI]: 2.54–13.89; P <0.001), hyposthenuria (OR = 3.76, 95% CI: 1.25–11.30; P = 0.018) and sleep disorders (OR = 2.90, 95% CI: 1.19–7.06; P = 0.019. *Conclusion:* Enuresis is common among children with SCD in Basrah, Iraq. Hyposthenuria was significantly associated with enuresis. Family history of enuresis and sleep disorders were also found to be significantly related to enuresis.

Keywords: Enuresis; Sickle Cell Disease; Children; Prevalence; Iraq.

Advances in Knowledge

- *Enuresis is prevalent among children with sickle cell disease (SCD); however, the role of hyposthenuria as a determinant of enuresis is controversial. This study found that hyposthenuria was a significant predictor of enuresis in children with SCD.*
- *To the best of the authors' knowledge, this is the first study in Iraq to examine the association between hyposthenuria and enuresis in children with SCD.*

Application to Patient Care

- *The results of this study may contribute towards understanding the underlying mechanisms of enuresis in children with SCD.*

Sickle cell disease (SCD), an autosomal-recessive haemoglobin disorder, is one of the most common heritable diseases in the world.[1] Some Eastern Mediterranean countries, including Iraq, have reported on this disease. In Basrah, Iraq, 6.48% of the population has the sickle cell trait.[2] Enuresis is more common among children with SCD compared to those with normal haemoglobin; however, prevalence rates vary widely, ranging from 26.4–51%, depending on study methodology and enuresis definition criteria.[3]

SCD is a multisystem disease, with one of the most typically affected organs being the kidneys due to medullary ischaemia and infarction. The underlying aetiopathogenesis of enuresis in SCD is not fully known. It has been related to tubular dysfunction manifested as defects in urinary concentration (hyposthenuria) and acidification, low functional bladder capacity and high overnight urine volume and glomerular hyperfiltration caused by increased prostaglandin production.[3–6] Enesh *et al.*, on the other hand, revealed that enuresis in children with SCD is related to other causative variables that are common in the general population as opposed to hyposthenuria.[7] Similarly, other studies have found that potential mechanisms underlying nocturnal enuresis in patients with normal haemoglobin genotype (haemoglobin AA) are equally relevant in SCD patients.[8,9]

The role of hyposthenuria as a predictor of enuresis in SCD patients is debatable, and there is a lack of studies on the subject in Basrah, Iraq. Therefore, this study aimed to verify the role of hyposthenuria in enuresis among children with SCD.

Methods

This cross-sectional study was conducted at the Basrah Center for Hereditary Blood Diseases, Basrah, Iraq, from December 2020 to May 2021. Children with steady-state SCD were included. Subjects with diabetes mellitus, epilepsy, features of urinary tract

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