Early detection of kidney dysfunction in Egyptian patients with beta-thalassemia major

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Background: Renal proximal tubular dysfunction may occur in children with beta-thalassemia major without clinical manifestations of renal dysfunction or a decrease in GFR. Early identification of patients at high risk of developing renal damage is of great importance as it may allow specific measures to be undertaken that will delay the progression of renal injury and thus reduce the incidence of renal impairment.

Objective: To investigate the presence of glomerular and/or tubular dysfunction in children with beta-thalassemia major using routine and early markers tests such as urinary NAG (N-acetyle-beta-Dglucosaminidase) and To correlate the urinary NAG level with other clinical and laboratory findings.

Patients and method: The study included 45 patients with beta-thalassemia major attending Fayoum University Hospital. Their ages ranges from 3 to 15 years. The study also enrolled 25 cases were taken as age & sex matched healthy controls. Kidney function tests, blood sugar, Sodium, potassium, calcium and phosphorus and urinary NAG (N-acetyl-B-D-glucosaminidase) levels were checked and statistically compared.

Results: Our results showed increased urinary excretion of NAG in 55.6% of cases with highly statistically significant differences between cases and controls. Glomerular filtration rate (GFR) levels were lower in patients than controls. Serum levels of creatinine were higher in 40% of patients. We found increased urinary excretion of Ca in 26% of patients and uric acid excretion in 38% of patients. And positive correlation between urinary NAG and serum creatinine, duration of the disease and urinary Ca/Cr ratio. Also urinary NAG levels were higher in patients with splenectomy than in patients with splenomegaly.

Conclusion: Our data confirm that glomerular and tubular dysfunctions exist in children with beta-thalassemia major. As renal dysfunction may not be detected by routine tests, use of early markers is recommended. Urinary NAG excretion can be considered a reliable index of the tubular toxicity and a possible predictor of proteinuria so it is recommended be evaluated in beta-thalassemia patients.