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Clinical Presentation and Outcome of Acute Post-Streptococcal Glomerulo Nephritis, in Sudanese Children

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ABSTRACT

Introduction: Acute Post-streptococcal glomerulonephritis (APSGN) is a common cause of acute glomerulonephritis, presented with hematuria, proteinurea, oliguria, hypertension and odem. The prognosis of children with APSGN is usually excellent.

Methods: This is a retrospective and prospective cohort .study of Sudanese children with APSGN followed in tertiary care hospital between 2015 and 2021, patients who presented for follow up 1-5 years after initial diagnosis. Were assessed for protienurea, hematurea, urine for albumin creatnine ratio and Glomerular Filteration Rate (GFR).

Results: Data of 144 children 99 males (68.7%) was analyzed. At presentation 102 (70.9%) had sever acute kidney disease requiring dialysis .On discharge 121(84.7%) recovered their renal function, 22 (15.2%) showed no recovery and one child died. Ninety out of 144 children presented to follow up 1-5 years after initial diagnosis .Fifty six of these children (62.2%) had normal blood pressure and GFR, while thirty four showed no recovery, twenty three (23) of them developed CKD, while 11 progressed to ESRD. Among children with normal GFR, 23 patients had micro albumiurea and hematurea.

Conclusion: The establishment of the comprehensive diagnosis, treatment facility in our center since 2005 and educate pediatrician country wide has lead to better recognition and management of children presented with APSGN.

Key words: Children, Chronic kidney disease, Post streptococcal, Glomerulo, Nephrities, Sudan

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INTRODUCTION

Acute Post-Streptococcal Glomerulonephritis (APSGN) is an acute, reversible disease characterized by spontaneous recovery in the majority of patients. It is an immune-mediated disease associated with acute upper respiratory tract infections and skin infections by β-hemolytic Streptococcus group A bacteria with clinical manifestation of edema, gross hematuria hypertension, proteinuria and oliguria persist more than 3 weeks. Typically, gross hematuria and edema develop 7 days to 12 weeks after the streptococcal infection. Spontaneous resolution of the clinical manifestations is generally rapid. Diuresis usually ensues within one to two weeks, and the serum creatinin concentration returns to base line within four weeks. The rate at which urinary abnormalities disappear is more variable [1]. Hematuria usually resolves within 6 months, but mild proteinuria is present in 15 percent of patients after 3 years and in 2 percent of patients after 10 years. It occurs in underdeveloped countries and developing countries. Post-Streptococcal Glomerulo Nephritis (PSGN) is most common in children aged 5-12 years but not common before the age of 3 years. The most common acute glomerulonephritis is PSGN which is found mostly in developing countries and affecting more children than adults and leading to acute kidney injury, and potentially increasing morbidity in children and threatening life if delayed diagnosis and subsequently inaccurate treatment. Although most patients eventually have a complete recovery, hypertension, recurrent or persistent proteinuria, and chronic renal insufficiency develop in some. The reported incidence of chronic renal insufficiency ranges from 0 to 10 per cent. It has been suggested that misdiagnosis, racial differences in the risk of progression of renal disease, and differences in the natural history of sporadic and epidemic glomerulonephritis may account for these discrepancies [2].

There are only a few studies on the clinical profile and follow up of these patients. The analysis of the outcome is important for a better awareness of the long-term prognosis. This study is an attempt to identify the various clinical manifestations of acute nephritic syndrome and to analyze the outcome.

MATERIAL AND METHOD

This is a retrospective and prospective cohort .study was carried out during the period from November 2020-April 2021. The study was conducted in pediatric nephrology unit at Soba university hospital between 2015 and 2020.

Soba University hospital

The teaching hospital of Khartoum University- was established in 1975. It is a tertiary hospital offering different medical specialties and services, recognized by Sudan Board for Medical Specialization and Federal Ministry of Health for the training of registrars and house offices. The pediatric department contain; three General units, Neonatology unit, Neurology unit and Nephrology unit. The Nephrology unit covered by four consultants and composed of; two Nephrology wards, peritoneal dialysis ward, Hemodialysis ward and renal transplantation ward.

Study population

All pediatric patients diagnosed with post-streptococcal glomerulonephritis, admitted to Soba university Hospital during (2015-2020).

Inclusion criteria

All pediatric patients diagnosed with post-streptococcal glomerulonephritis, admitted to Soba university Hospital during (2015-2020), and those managed during the study period.

Exclusion criteria

Those out of study area and setting. Patients with other causes of Oliguria, Edema, Hypertension and Hematuria. Data was collected using a pre designed interviewing questionnaire, included two parts: first one for patient's demographic data and second part for patient's clinical data, the questionnaire was filled from patients and their records, by the researcher. Normal ranges of investigations were revised according to patient's age. Sample size: Total coverage of all patients diagnosed as APSGN. Expected to be (100 -150) cases. Then data was exported to SPSS version 25.0 for data analysis .Descriptive statistics in term of frequency tables with percentages and graphs. Descriptive analysis will performed for all study variables with mean and standard deviation for quantitative data and frequencies with proportions for qualitative data [3].

Bi-variable analysis to determine the associations between the main outcome variable and the other relevant risk factors with Chi square test (for categorical variables) and t- test (quantitative variables) statistical tests. P value of 0.05 or less is considered significant. Data with be represented after analysis in form of uni-variable tables, cross tabulation (bi variable tables), multivariable tables, figures and narrative illustration.

RESULTS

Data of 144 children with acute post streptococcal glomerulonephritis were analyzed. The mean age at time of presentation was (7 ± 2) years old (range 2-16years), More than half (55.6%) of the study participants were in age group 5-10 years old. Study participant were predominantly males 99(69.4%), Figure 1. Clinical and laboratory finding at presentation with APSGN are out lined in Table 1. 34.7% of study participants presented with nephrotic range proteinuria. On admission to hospital 102 of study participant (70.9%) had acute kidney disease, the mean serum creatinine was 1.4mg/dl range (0.2-7.3 mg/dl), and mean GFR was 6.5 ml/min/ 1.73 m^2 range (6 -29 ml/min/1.73m^2). On discharge 121 of study participant (84.7%) had normal kidney function, and normal blood pressure with mean serum creatinine 0.8 ±0.2 (range 0.5-1.4) mg/dl and mean GFR 90ml/min/ 1.73m2 .rang (65.9 -150ml/min/1.73m2), one dead (0.69%) and 22 patients showed no recovery (14.61%), table (2).

In 22 patients initial renal biopsy showed severe crescent formation in 11 patients ,diffuse proloferative glomerulonephrities in 6 patients and 5 patients showed membranoproliferative glomeurlonephrities. Serology for hepatitis B,C and lupus nephrities were negative. Nightly of study participant (62.5%) presented to follow up1-5 years after initial diagnosis , 56 (62.2%) complete recovery with normal kidney functions and blood pressure, 34 (37.8 %) showed no recovery, 23 (25.6%) progressed to CKD and 11 (12.2%) ESRD, Table 3. All study participants that had severe disease were required dialysis at initial presentation. Among children with normal GFR ,urinary abnormality were found in 23 patients ,microalbuminurea and hematurea in 15 patients ,and hematurea in 8 patients none of them had nephrotic proteinurea.

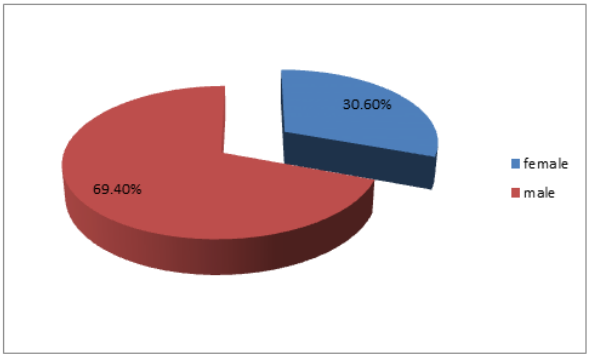

Figure1: Gender distribution among study participants, N=144.

Table1: Clinical and laboratory finding.

	Percentage (%)
Hematuria	100
Edema	100
Proteinuria	100
HTN	42.36
Oliguria, high creatinine	70.9

Table2: Outcome on discharge of study children: N=144.

Out come	Frequency	Percentage (%)
Recovery	121	84.7
No recovery	22	14.61
Death	1	0.69
Total	144	100

Table 3: Outcome of study children after 1-5 years follow up.

	Frequency	Percentage (%)
Normal GFR and BP	56	62.2
CKD	23	25.6
ESRD	11	
Total	90	100

DISCUSSION

Data of 144 children with APSGN followed in our hospital was avialble for the study. The mean age at presentation was 7 ± 2 years (range 2-16 years) and patients were predominantly males .These finding are consisted with other studies reported in India. Clinical features at presentation were similar to finding reported in other studies. The most common complication observed in this study is high incidences of presented with AKI (70.9%), 10.8% requied dialysis ,which explain that most of patients presented to the hospital were sever disease that required referral for tertiary care management, similar association was reported in Turkey study HTN in 73.3% and 4% underwent dialysis. Many studies reported excellent immediate prognosis for children with APSGN. However other studies from Europe and India reported less favorable prognosis. Failuer of recovery with progression to CKD occurred in 25.6%. In these studies crescentic glomerulonephrities and nephrotic range protein urea at presentation were significantly associated with progression to CKD [4]. In our study 16 patients showed no recovery and progression to CKD, in patients who no recovery biopsy showed crescentic GN, a similar association with other studies. The long term prognosis of APSGN was investigated in many studies intial reports suggested excellent prognosis but the periods of follow up were relatively short. Results of subsequents studies were in consistence in showing variable rate of urinary abnormalities. More over the long term prognosis in some population may be influenced by the occurrence of other risk factores for CKD in the community.Such observation were reported from Australia high prevalence of low birth weight diabetes and metabolic syndrome.

Studies on long term out come of APSGN and it is contribution to CKD had variable results report from two Indian studies. Asturalia and Venzula showed high rate of urine abnormalities and or CKD on long term follow up. A large study from Australia reported albuminurea(any degree) in 22%,overt albuminurea in 6% and hematurea in 10%. The study from venzulia reported overt albuminurea in 11.2% of cases. Two Indian studies reported CKD in 19% and 14% of patients. Hypertension and urine abnormality were detected in 42.3% and 25.5%. In contrast studies from europe reported low prevalence of presented urinary abnormality and CKD. In study from Europe (Germany, Huxnburge, Australia) only 3 patients out of 137 developed CKD. In study from Trinidi persistent urinary abnormality and hypertension were detectd in only 1.8% and 1.4% respectively. In this study hematurea and micro albuminurea were detected in, all patient seen at 3-5 months [5].

CONCLUSION

The establishment of the comprehensive diagnosis, treatment facility in our center since 2005 and educate pediatrician country wide has lead to better recognition and management of children presented with APSGN.

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