



A STUDY ON CLINICAL PRESENTATIONS AND LABORATORY PROFILE OF ACUTE GLOMERULONEPHRITIS IN CHILDREN ADMITTED IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Acute glomerulonephritis is the most common reversible cause of kidney disease in children. Although most common presentations are oedema, hypertension, haematuria and oliguria, glomerulonephritis may manifest with atypical features. **Aims and objectives:** The aim of the study was to evaluate the frequency of various clinical manifestations of glomerulonephritis and to identify various abnormalities in laboratory profile in children with glomerulonephritis. **Materials and methods:** 30 children admitted in paediatric department, King George Hospital, Visakhapatnam with clinical features of glomerulonephritis were enrolled into the study. Data on clinical features, laboratory parameters and outcome was recorded. **Results:** Males were more commonly affected. Majority were in the age group of 9-12 years. Most common presentation was facial puffiness. Atypical presentations were observed in 40% cases. Anaemia was observed in 50% cases. Hypertension was seen in 56% of cases. PSGN was commonest cause of AGN. Hypocomplementemia was seen in 80% cases. **Conclusion:** Even though most children with acute glomerulonephritis present with common clinical features, early identification of atypical presentations of acute glomerulonephritis should be emphasised as their prompt recognition can lead to reduction in mortality.

KEYWORDS : Acute glomerulonephritis, clinical features, laboratory parameters, atypical presentations.

INTRODUCTION

Acute glomerulonephritis is most common reversible cause of kidney disease in children. In developing countries like India, PSGN still remains the leading cause of glomerulonephritis in children accounting for 80% of cases. Post streptococcal glomerulonephritis may occur after impetigo, pharyngitis or infected scabies. M protein, Endostreptosin, Pre absorbing antigen, Nephritis strain associated protein, streptococcal pyrogenic exotoxin B or nephritis associated plasmin receptor are the potential nephritogenic antigens. Post streptococcal glomerulonephritis usually affects the children in the age group of 5 to 12 years. Males are predominantly affected than females. Although most children with AGN present with hematuria, oliguria, edema and hypertension, atypical presentations like acute pulmonary edema, congestive cardiac failure, hypertensive encephalopathy and nephrotic nephritic picture are not uncommon. This study is undertaken to identify these atypical presentations which may be overlooked. Early identification of atypical presentations through clinical features and laboratory parameters help in reducing the mortality and morbidity.

MATERIALS AND METHODS :

The present study was a hospital based observational study conducted in a tertiary care hospital between June 2020 and May 2021.

The study was approved by institutional ethics committee. Written informed consent was taken from parents/caregivers. The data was recorded in a predesigned proforma. 30 children aged 1 to 12 years admitted with clinical features of

acute glomerulonephritis were enrolled in the study. Patients details like age, sex, clinical features at admission were noted. Blood pressure was recorded and thorough physical examination was done.

Investigations like Complete hemogram, ESR, CRP, blood urea, serum creatinine, serum electrolytes, ASO titres, blood culture, urine microscopy, urine culture, USG abdomen and Complement levels were done for all cases. Other investigations like 2dECHO, renal Doppler and CT brain were performed whenever required. Descriptive data was represented in frequencies and percentages. Data was tabulated and statistically analysed.

RESULTS:

The study was conducted among 30 children admitted with features of acute glomerulonephritis to paediatric ward, KGH over a period of one year. Table 1 shows details of study population. 21 were males and 9 were females. Majority of children affected were in the age group of 9-12 years. 18 children presented with typical features of oliguria, hematuria and puffiness of face. Atypical presentation was seen in 12 children.

Table-1: Age And Sex Distribution And Clinical Presentation

Age	Male	female	total	percentage
< 5 years	1	2	3	10%
5 – 8 years	8	3	11	36%
9 – 12 years	12	4	16	53%
Total	21	9	30	100%

Presentation	cases	Percentage
Typical	18	60%
Atypical	12	40%
1.Hypertensive Encephalopathy	4	13%
2.Congestive cardiac failure	3	10%
3.Nephrotic with nephritic syndrome	2	7%
4. Acute kidney Injury	3	10%

Table 2 shows the various clinical features in children affected with AGN. Most common clinical feature at presentation was facial puffiness (96%) followed by oliguria (86%), pedal edema (76%) and macroscopic hematuria (60%). Pyoderma and sore throat were seen in 57% and 30% of children respectively. Hypertension was recorded in 56% cases.

Table – 2: Clinical Features :

Clinical features	Total no. Of cases	Percentage
1.Facial puffiness	29	96%
2.Pedal oedema	23	76%
3.Abdominal pain	12	40%
4.Abdominal distention	21	70%
5.Oliguria	26	86%
6.Hematuria	18	60%
7.Skin lesions	17	57%
8.Sore throat	9	30%
9.Fever	18	60%
10.Breathlessness	8	26%
11.Vomiting	12	40%
12.convulsions	4	13%
13.Altered sensorium	7	23%
14. Hypertension	17	56%

PSGN was the most common cause of AGN in the present study. Plasmodium falciparum malaria, streptococcus pneumoniae, staphylococcus and scrub typhus were other infections associated with AGN. (FIGURE 1)

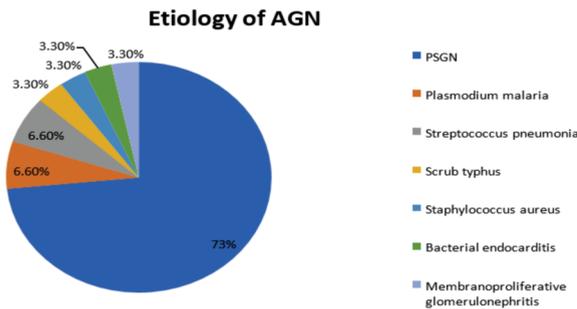


Figure 1: Etiology of Agn

Table 4:

1.Blood urea <40mg/dl	No. Of cases	percentage
>40mg/dl	18	60%
	12	40%
2.Serum creatinine < 1mg/dl	18	60%
> 1mg/dl	12	40%
3.Serum sodium <135	8	27%
135-150	22	73%
> 150	0	0%
4.Serum potassium <3.5	1	3%
3.5-5.5	27	90%
>5.5	2	7%
5.ASO titres <200	12	40%
>200	18	60%

6.C3 levels Normal	6	20%
Low	24	80%
7.Serum cholesterol <200mg/dl	21	70%
>200mg/dl	9	30%
8.Anemia <5yrs (<11gm/dl)	2 out of 3 cases	7%
5-11yrs (<11.5gms/dl)	24 out of 26 cases	80%
12yrs (<12gm/dl)	1 out of 1 case	3%
9.Spot urine protein to creatinine ratio 0.2 to 2	21	70%
>2	9	30%

Azotaemia was seen in 12 (40%) children. Of them 3 children required peritoneal dialysis. 8 (27%) children had hyponatremia, 2 children had hyperkalemia and 9 children had hypercholesterolemia. Out of 22 children with PSGN, 18 children had elevated ASO titres. Hypocomplementemia was seen in 24 out of 30 children. Anaemia was present in 27(90%) out of 30 children.

DISCUSSION:

In the present study, 30 children presenting with clinical features of AGN were enrolled. Male to female ratio was 2.3:1. Studies done by Kapil Bhalla et al (1), Rodriguez Iturbe et al(2) and Gunasekharan et al (3) also showed male preponderance. Vani et al(4) showed higher incidence in girls.

In the present study most common age group involved is 9 to 12 years. Only 3(10%) children were below 5 years of age. In other studies most of the children affected with AGN were above 5 years age. This could be explained by the fact that PSGN is the most common cause of AGN in children and streptococcal infections were common in children above 5yrs.

In the present study 96% children had facial puffiness where as 76% children had pedal edema. Other studies done by Kondapalli et al(5), Vani et al(4) and Sunil Kumar Agarwalla et al(6), also reported higher incidence of facial puffiness than pedal edema. This could be explained by the fact that edema in renal conditions like AGN starts as puffiness of face due to accumulation of fluid in loose areolar tissue around the eyes and then extends to other parts of the body. The incidence of oliguria in the present study is comparable to the studies done by Sunil Kumar Agarwalla et al(6), Kondapalli et al(5) and Vani et al(4). Though oliguria due to glomerular damage manifests prior to facial puffiness it would remain unnoticed by the parents.

The incidence of gross hematuria in the present study was comparable to studies done by Sunil Kumar Agarwalla et al(6) and Meherban Singh et al(7). The incidence of microscopic hematuria in the present study was comparable to studies done by Meherban Singh et al(7) and Vani Bai et al(4). Hypertension in present study (96%) was comparable to studies done by McGill et al(8) and Vani Bai et al(4). In the present study hypertension was treated with nifedipine and furosemide and recovered within 2 weeks. One child required additional drugs labetalol and clonidine and hypertension lasted for 4 months in that child.

In the present study 12 out of 30 children had atypical presentations which is similar to studies done by Kuralvanan Gunasekaran et al(9) and Islam Bhuiyan et al(10). Kapil Bhalla et al(1) showed higher incidence of Acute kidney injury and congestive cardiac failure in children with AGN.

The incidence of azotemia (40%) in the present study was comparable to studies done by Kondapalli CS et al(42%)(5) and Yadav et al (42.6%)(11). Peritoneal dialysis was done in 3

cases. AGN is the most common reversible cause of Acute kidney injury in children. Timely identification and early intervention is life saving.

Elevated ASO titres were seen in 60% of children which was comparable to studies done by Kondapalli CS et al(5), Vani Bai et al(4) and Singh M Aziz I et al(12). In the present study 22 children(73%) had post streptococcal glomerulonephritis of whom 18 (60%) children showed elevated ASO titres. ASO titres might be negative in PSGN secondary to streptococcal skin infection as infection of the skin does not always elicit strong ASO response.

In the present study Hypocomplementemia(80%) and normal complement levels (20%) was comparable to study done by Sunil Kumar et al(6). AGN in children is most often immune complex disease leading to hypocomplementemia but complement levels may be normal in AGN secondary to visceral abscess, staphylococcal sepsis, etc.

CONCLUSION

Although most of the children presented with features like facial Puffiness, pedal edema, oliguria and hematuria, atypical manifestations like hypertensive encephalopathy, congestive cardiac failure, nephrotic syndrome and acute kidney injury were identified among the children with AGN. Hence emphasis should be made on the identification of these presentations helps in preventing the mortality in children due to these atypical presentations.

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