Clinico-biochemical Correlation of Acute Glomerulonephritis in Children

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INTRODUCTION

Acute nephritic syndrome consists of sudden onset of oedema, hematuria, hypertension, oliguria and varying degree of proteinuria. It may follow infection with a variety of bacteria, viruses and parasites or can be a part of systemic diseases (or) as primary glomerular disease. The aim of this work was to study the clinical, biochemical parameters of acute glomerulonephritis in children.

MATERIAL AND METHODS

The present study included 50 cases of acute glomerulonephritis in children belonging to the age group of 2 to 12 years admitted to department of pediatrics of Government General Hospital, Guntur (A.P) during the year July 2016- June 2017.

RESULTS

Most commonly involved age group is 6 – 8 years (42%) followed by 10- 12 years (26%) least common is 2- 4 years (4%). (Table-1)

Most commonest presentation is puffiness of face (90%) followed by oliguria (70%) oedema of feet (50%). (Table-2)

Most common clinical finding is puffiness of face (90%), oedema of feet (70%), and hypertension (60%) (table-3).

Out of 50 cases 45 cases have decreased complement levels (table-4).

Total Incidence

From July 2016 to June 2017 in paediatrics department, Government General Hospital, Guntur (A.P)

Seasonal Incidence

Most of the cases admitted from August to December.

Age and Sex Distribution

The incidence is less in between the age 2 to 4 years, more cases admitted in between the age of 6 to 8 years¹² and 10 to 12 years. Most of the cases observed in female children.

Social Status

All most all cases except one case observed in low socio-economic group.

Clinical Profile

Most of them presenting with red colour urine, puffiness of the face oliguria, edema, breathlessness, headache, vomiting, pain abdomen, convulsions, fever, altered sensorium were

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Statistical Analysis

The observations of this study are represented in the tables. Descriptive statistics were used to interpret the data.

the presenting symptoms. Other common finding include
the anaemia with x-ray finding of increased pulmonary
vasculature and some times cardiomegaly and volume over
load symptoms in some children.
Hypertensive encephalopathy change in CT Scan Brain and
some with hypertensive changes in fundus examination.

**Blood Pressure**
Hypertension was recorded in 30 children (60%) with mild,
moderate and severe hypertension.

**Lab Investigation**
Albuminuria in 86% of the cases (Trace,+1,+2,+3), 98%
with hematuria including microscopic hematuria).

**Serological**
ASO titers increased mainly in children with pharyngitis.
The children suffering with pyoderma didn’t show elevated
levels of ASO titers. The levels of the ASO titer is unrelated
to the incidence, severity or prognosis of the renal disease.
30 children have the H/o pharyngitis, in all these children
ASO titre is positive. 20 children have history of pyodermna
and in only 3 members were ASO titers positive.

**Blood Urea and Serum Creatinine**
The blood urea and serum creatinine also not increased that
much. There is disproportionate rise between the blood urea
and serum creatinine. There is only one child with raised
levels of blood urea and serum creatinine. (Blood urea-
80mg/dl, serum creatinine-2.2.)

**Serum Electrolytes**
Normal in most of them with hyponatremia in 6 children(12%)
mainly suffering with seizure activity, hypokalemia in 2
members, hyperkalemia in one children.

**Serum Cholestrol**
Most of them have normal serum cholesterol except four
children who shows the MPGN type-II, SLE, FSGN on renal
biopsy.

**Serum total protein**
60% of the children serum total protein level in between 5 to
6 gram/dl, 40% with more than 6 gram/dl.

**Serum Complement level**
Except 5 cases remaining 45 children in the study had
decrease levels of complement. Out of there 45 children
only 31 children underwent repeat serum complement
levels after 2 months (8 weeks) 29 children had the normal
complement levels two cases still has decreased levels
of complement which on renal biopsy shows one case of
membranoproliferative glomerulonephritis type-II.7,8 One
child is suffering with systemic lupus erythematosis in whom
anticnuclear antibodies positive.

**Radiological appearance of the chest**
Most of the children had normal study of x-ray chest. Some
shows cardiomegaly, some with increased pulmonary
vasculature(congestion) very less with pleural effusion.

**U/s Abdomen**
Most of the children have bulky kidney, decreased
echotexture and in those children suffering with hypertensive
encephalopathy shows the bulky kidney with increased
echotexture.

**Mortality Pattern**: Out of 50 cases there is no mortality.

**DISCUSSION**
In our study out of 50 cases two cases (4%) are between
2 – 4 years age group. 36 cases (72%) are between 2 to 10
years and 12 cases (24%) are above the age of 10 years. So,
maximum incidence is between the 2 to 10 years. Study of
Manhas8 et al had shown 17% of children are below the age
of 5 years and 43% are between the age of 5 to 12 years.
In this study, the most common presenting symptom is
puffiness of the face (90%) the other symptom is the oliguria(70%) macroscopic hematuria(44%) and edema of the feet(50%).

Sarala et al has documented the following clinical features in the study of 135 children. 25% have edema, 5.2% pulmonary edema, 13.3% azotemia, 4.4% hypertensive encephalopathy. Poon-King et al noted that the presenting symptom in all patient was edema, only 25% has gross hematuria at once, 9.2% has hematuria on microscopic examination.

Blood Pressure recording with standard sphygmomanometer are taken many times in a single and classified normal, mild, moderate and severe on the evaluated blood pressure when analysed for age. Hypertension is present in 30 (60%) children out of 18(36%) mild hypertension, in 4(8%) children moderate hypertension, and 8(16%) has severe hypertension.

Manhas et al showed 69% had hypertension out of which 38.3% had mild, 29.7% has moderate 5.1% had severe hypertension. Roentgenogram analysis of 50 children with AGN in this study showed 58% normal cardiac shadow with the prominent lung vasculature study, cardiomegaly 32%, pneumonitis in 10%.

The results in this study are correlating with the study of Poonking et al, study of Manhas et al, study of Sarala et al, study of John Kirkppatrick. Most of the children with acute glomerulonephritis present with hypertensive encephalopathy, acute cardiac failure and acute renal failure.

There is very good recovery for acute glomerulonephritis. Spontaneous recovery occur in most instances, children with normal blood pressure, urine output of more than 400ml can be managed at home. Bed rest is beneficial in those with edema and hypertension. Urine output, oral input and weight should be recorded everyday. Sodium intake is restricted in all cases with edema and hypertension. All foods rich in potassium need to be restricted till the urinary output is more than 400ml per day. If we manage the crisis, the outcome will be good in case of acute glomerulonephritis.

CONCLUSION

Following conclusions are drawn from the present study. There is male predominance between 2 to 10 years, female predominance between 10 to 12 years. 4 to 10 years common age group affected in this study. Majority of the cases are seen during the period between August to December. Preceeding illness is recorded in 64% of cases and upper respiratory infection being the commonest. Almost all patients presented with insidious onset of puffiness of the face and pedal edema. Macroscopic hematuria in 44% of the cases. Microscopic hematuria all most in all cases(98%). Majority of the children has proteinuria(from trace to ++). Only 6% of children with 3+ proteinuria. All children with H/o. URI showed increased levels of ASO tilters,those with H/o. pyodermia are negative for ASO titer. Majority of the children had low level of complement (C3) at the time of admission and normal level of complement (c3) after 2 months (8 weeks). Most of the children x-ray chest showed normal cardiac shadow with increased pulmonary vascularity. In most of the children, ultra sound abdomen showed bulky kidney with decreased echotexture.

There is disproportionate rise in blood urea and serum creatinine. The serum protein levels are normal in most of the children with negligible levels of 24 hour urinary protein. All the children recovered with crystalline penicillin, restriction of salt and oral fluid, diuretics and antihypertensive therapy if necessary.

REFERENCES