

## Acute Glomerulonephritis in Enugu

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### Summary

**Okafor HU, Okoro BA and Ugwu GI. Acute Glomerulonephritis in Enugu.** *Nigerian Journal of Paediatrics* 1995; 22:31. The present retrospective study of acute glomerulonephritis covering a period of seven years was aimed at the establishment of the pattern of the disease in Enugu and its environs. There were 216 patients (male - female ratio of 1.3:1), aged between nine months and 16 years, with an average of 31 new cases per year. The peak age incidence occurred between five and eight years. The monthly distribution of the cases showed two peaks in July and December/January, respectively. The salient clinical features were oedema, hypertension and oliguria. Haematuria and proteinuria of moderate and severe degrees occurred in all the patients, while granular casts were present in 74.0 percent of the cases. The commonest complication was hypertensive encephalopathy, followed by acute renal failure and heart failure. Mortality was 1.4 percent which was acceptably low in contrast to the findings elsewhere.

### Introduction

ACUTE glomerulonephritis (AGN) is the most common non-suppurative renal disease of childhood.<sup>1</sup> Although it accounts for 0.5 percent of all hospital admissions for children in the United States of America (USA),

its true incidence is unknown. This has been explained by the large number of children with mild and unrecognized disease. For example, Kaplan *et al*<sup>2</sup> have reported that 50 percent of patients discovered to have acute AGN during an epidemic were asymptomatic. Most cases of the disease in African children are said to follow impetigo.<sup>3</sup> There is however, very little information on the epidemiology of the disease in different parts of the African continent.<sup>3</sup>

Here in Nigeria, studies on childhood AGN have been undertaken in various parts,<sup>4</sup> <sup>5</sup> but to our knowledge, no study on this

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disease has been carried out in Enugu, with a different geographical setting. The aim of the present retrospective study was to determine the pattern of the disease among children who attended the University of Nigerian Teaching Hospital (UNTH), Enugu, in order to obtain baseline information on AGN and also to compare our data with those from other centres in Nigeria and elsewhere. The UNTH, a referral as well as a tertiary institution, serves the old Anambra and neighbouring States.

#### Patients and Methods

Case notes were reviewed of patients who attended the paediatric clinic, or were admitted into the paediatric wards with a diagnosis of acute glomerulonephritis over a period of seven years (January 1985 to December 1991). The criteria for diagnosis and therefore, inclusion into the study, were acute onset of haematuria, proteinuria, hypertension and oliguria.<sup>6</sup> Relevant data that were extracted from the case notes included name, sex, age, year and month of presentation, the presenting clinical features, such as oedema, oliguria, haematuria etc, antecedent history of sore throat or recent skin infection and the duration of hospitalization. Laboratory data extracted included 24-hour urinary protein estimation, anti-streptolysin-0 (ASO) titre, total serum proteins and differentials, serum urea, electrolyte and creatinine concentrations, urine microscopy for presence of granular and red cell casts, biochemical detection of proteinuria and duration of macroscopic/microscopic haematuria. These laboratory data were incomplete in some cases, mostly because parents could not afford the cost for these tests. Serum C3 complement levels

could not be performed due to lack of facilities.

#### Results

There were 216 patients (124 males, 92 females; male: female ratio 1.3:1), aged between nine months and 16 years, with a peak of 109 cases (50.5 percent) in the five-to-eight-year age group (Table 1). Two (0.9 percent) of the patients were under one year of age.

TABLE I

Age Distribution in 216 Patients with Acute Glomerulonephritis

Age (years)	No of Cases	Percent of Total
Under 1	2	0.9
1 - 4	79	36.6
5 - 8	109	50.5
9 - 12	21	9.7
13 - 16	5	2.3
Total	216	100.0

TABLE II

Presenting Clinical Features in 216 Cases of Acute Glomerulonephritis

Feature	No of Cases	Percent of Total
Oedema	205	94.9
Hypertension	149	69.0
Dark-brown coloured urine	101	46.8
Antecedent history of skin infection	66	30.6
Antecedent history of sore throat	38	17.6

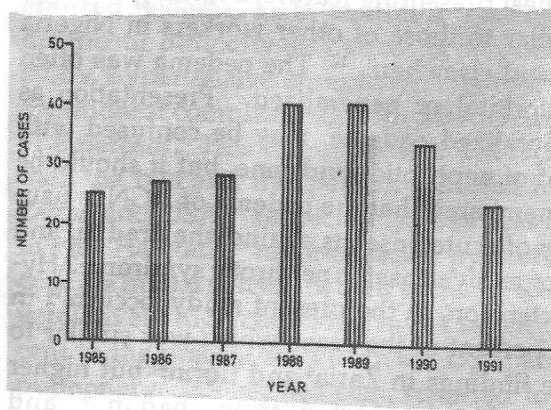


Fig 1: Annual and sex incidence of 216 cases of acute glomerulonephritis

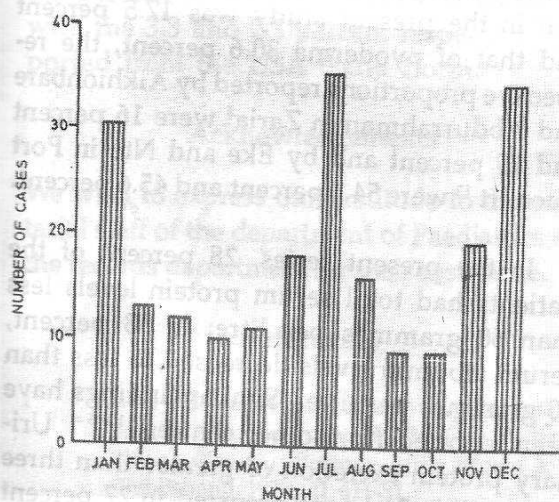


Fig 2: Monthly incidence for 216 cases of acute glomerulonephritis.

The annual prevalence of the disease (Fig 1) shows an average number of 31 cases per year, while the monthly distribution of the cases (Fig 2) shows two peaks in July and December/January, respectively. It is evident that oedema was the commonest feature, occurring in 205 (94.9 percent) of the 216 patients (Table II); this was followed by hypertension and oliguria in 149 (69.0 percent) and 101 (46.8 percent), respectively. Antecedent history of sorethroat was the least common, being obtained from 38 (17.5 percent), whereas pyoderma occurred in 66 (30.6 percent) of the cases. In 112 (52.0 percent) of the cases, there was no record of antecedent infection. Haematuria and proteinuria were found in all the patients, while granular casts were present in 160 (74 percent) of the cases. Low total serum protein  $\leq 60\text{gm/L}$  was found in 35 (28 percent) out of the 125 cases that this test was performed, while low serum albumin  $\leq 30\text{ gm/L}$  occurred in 48 (38.4 percent) of 125 determinations. The 24-hour urinary protein excretion was greater than three gm in 10 (27 percent) of the 37 specimens tested. Cellular casts were reported in 38 (17.6 percent) and hyaline casts reported in 10 (4.6 percent) of the 216 cases. ASO-titre was elevated in 51 (50.5 percent) of the 101 cases. Serum urea level was elevated to  $\geq 6.6\text{ mmol/L}$  in 103 (53.1 percent) of the 194 cases, while serum creatinine  $\geq 176\text{ mmol/L}$  was found in 29 (15 percent) of the 194 cases. Out of the 216 patients, 197 (91.2 percent) were hospitalized, while 19 (8.8 percent) were treated as outpatients. Of the 197 hospitalized patients, 120 (61 percent) stayed in hospital for two weeks or less, while 77 (39 percent) stayed for more than two weeks, due to complications of the illness. Microscopic haematuria disappeared

within three months in 204 (94.4 percent) of the 216 patients. Complications in the series comprised hypertensive encephalopathy in 25 (11.6 percent), acute renal failure in 22 (10.2 percent) and heart failure in 15 (7 percent) of the 216 patients. There were three deaths, a mortality of 1.4 percent. Two of the deaths resulted from acute renal failure, while one resulted from a combination of hypertensive encephalopathy and cardiac failure.

#### Discussion

Some 17 years ago, acute glomerulonephritis (AGN) was reported by Kaine and Okoli<sup>7</sup> to be the commonest renal disorder necessitating hospitalization of children at the same hospital where the present study was undertaken. The prevalence of 31 cases seen per year in the present series, has confirmed that AGN continues to be a common childhood problem in our geographical setting. Forty years ago in Ibadan, Hendrickse and Gilles<sup>8</sup> reported a prevalence of about six cases of AGN per year and this number is likely to have doubled by now, considering the increased population of Ibadan. The prevalence of AGN in the present study, was lower than those reported from Zaria<sup>4</sup> and Ilorin,<sup>5</sup> but higher than that from Uganda.<sup>9</sup> The gradual annual increase in the present series was also observed by workers in Zaria,<sup>4</sup> but by contrast, an annual decline was reported from other countries.<sup>10 11</sup> This decline in the prevalence of the disease was brought about by increasing urbanization and social development. The peak monthly prevalence that occurred in July as well as in December/January in our series was similar to the findings in Zaria,<sup>4</sup> where the peak occurred in July, during the second half of the year. It is how-

ever, difficult to explain the two peaks in the present study that occurred during the wet, rainy season of July and also during the dry, cold harmattan season of December/January.

In the present series, oedema was commonest presenting feature, a finding that was similar to those of other workers in Nigeria<sup>4 5</sup> and elsewhere,<sup>12</sup> The oedema was often periorbital or generalized. Presentation as generalized oedema, may be confused with that of nephrotic syndrome, but it should be remembered that the oedema of AGN is usually of acute onset as against the gradual and progressive onset in nephrotic syndrome. Hypertension, in the present study, occurred in 69 percent of the cases which was similar to the findings in Zaria<sup>4</sup> and Ilorin,<sup>5</sup> but higher than those reported from Ibadan<sup>8</sup> and Uganda.<sup>9</sup> Antecedent streptococcal throat infection or pyoderma has been reported by several African workers,<sup>4 5 8</sup> but the proportions of these infections vary from centre to centre. While the proportion of throat infection in the present study was 17.5 percent and that of pyoderma 30.6 percent, the respective proportions reported by Aikhionbare and Abdurrahman in Zaria<sup>4</sup> were 16 percent and 79 percent and by Eke and Nte in Port Hacourt<sup>13</sup> were 54.4 percent and 45.6 percent.

In the present series, 28 percent of the patients had total serum protein levels less than 60 grammes per litre; in 38 percent, serum albumin levels decreased to less than 30 grammes per litre. Similar findings have been reported from other centres.<sup>14 5</sup> Urinary protein excretion of greater than three grammes in 24 hours occurred in 27 percent of our cases. As this degree of urinary protein excretion is usually associated with gen-

eralized oedema, as in nephrotic syndrome, diagnostic difficulty may arise. In the present study, hypertensive encephalopathy was the commonest complication, with a frequency of 11.6 percent. This frequency is much higher than the two and five percent reported from Zaria<sup>4</sup> and USA,<sup>14</sup> respectively. Eke and Nte in Port Harcourt<sup>13</sup> reported acute pulmonary oedema in 20.4 percent of their patients, which is relatively high compared to the seven percent in the present series. In the USA, acute pulmonary oedema has been reported to be the commonest complication and cause of death,<sup>14</sup> while by contrast, hypertensive encephalopathy was the commonest complication in the present series as well as in the cases reported from Ilorin.<sup>5</sup> The mortality of 1.4 percent in our series was low compared with the 3.3 and 2.3 percent respectively, reported from the USA<sup>14</sup> and Ilorin.<sup>5</sup>

#### Acknowledgements

We wish to express our gratitude to the secretarial staff of the department of Paediatrics and the records department for their assistance.

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