

## Acute Glomerulonephritis in Zaria

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### Summary

**Aikhonbare HA and Abdurrahman MB. Acute Glomerulonephritis in Zaria.**  
*Nigerian Journal of Paediatrics* 1984; 11: 59. A retrospective study of 202 children with acute glomerulonephritis in Zaria over a four-year period is reported. The main clinical features were preceding or concurrent pyoderma/infected scabies in 79%, generalised oedema in 73% and hypertension in 68% of the patients. Three quarters of the patients were between four and ten years of age. Serum albumin was less than 300mg/100ml (30g/L) in 44%, and hepatitis B surface antigen was detected in the serum of 41% of the patients tested. There were only three deaths.

### Introduction

ALTHOUGH acute glomerulonephritis (AGN) is said to be common in Africa, there is little information about the epidemiology of the disease in different parts of the continent.<sup>1</sup> The disease can follow streptococcal infection of the skin or throat.<sup>2</sup> AGN following skin infection, is more common in tropical countries.<sup>3</sup> The purpose of the present retrospective study is to describe the clinical and laboratory features as well as the outcome in children admitted to the Ahmadu Bello University Hospital, Zaria, with AGN over a four-year period.

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### Materials and Method

The patients included in the study were children admitted to the Department of Paediatrics, Ahmadu Bello University Hospital, Zaria between August 1978 and July 1982. Criteria used for the diagnosis of AGN were:

- (a) Clinical features of acute onset renal disease characterised by some or all of the following: oedema, haematuria, oliguria and hypertension;
- (b) Laboratory evidence of renal disease proteinuria, red blood cells or casts on urine microscopy and azotaemia, all of which resolved within three months except for erythrocyturia which could persist longer;
- (c) Low serum complement C<sub>3</sub>;
- (d) evidence of preceding or concurrent streptococcal infection.

The first two criteria plus one other criterion were required for inclusion in the study. Standard

laboratory techniques were used for the investigations. These investigations included urinalysis, estimation of 24hr urine protein in some cases, serum urea, creatinine, electrolytes, complement C<sub>3</sub>, proteins and anti-streptolysin-O titre (ASOT). Sera were tested for hepatitis B surface antigen (HBsAg) by countercurrent immunoelectrophoresis. Hypertension was defined as blood pressure above 120/80 mm Hg, azotaemia as serum urea above 39mg/100ml (6.5mmol/L) and low C<sub>3</sub> as levels below 70% of normal value for the laboratory. ASOT above 1:160 was regarded as high. After discharge from the hospital, patients were followed up as outpatients; urinalysis was done routinely at each visit.

## Results

During the four-year period, 202 children (116 males and 86 females, a ratio of 1.35:1) were admitted with AGN, giving an average frequency of 50 cases per year. The ages ranged from one to 15 years; 153 of the patients (76%) were between four and ten years old. The Figure shows that AGN was more frequent during the second half of the year.

### *Preceding infection*

The site of antecedent infection was stated in 126 cases. Of these, 100 (79%) had pyoderma (mainly infected scabies), while 16 (13%) gave a

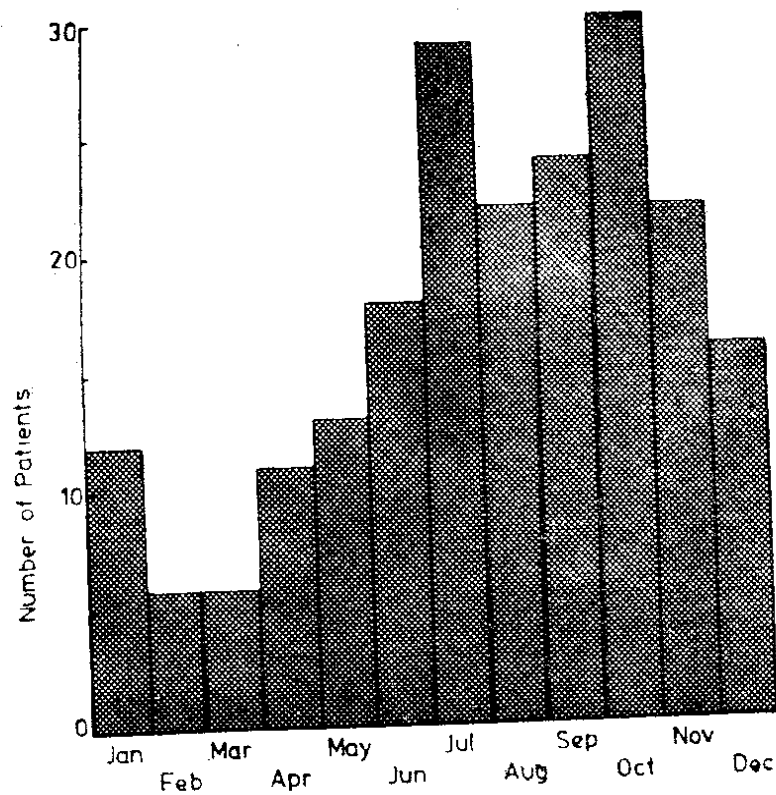


Fig. Monthly incidence of acute glomerulonephritis.

history of antecedent sorethroat. Other lesions were boil (5 cases), leg ulcer (4 cases) and infected burn (one case). The interval between antecedent infection and onset of symptoms of renal disease was recorded in 80 patients: one to three weeks in 55 patients, four to eight weeks in 19 patients and over nine weeks in six patients.

#### *Clinical and Laboratory Data*

The Table summarises the main symptoms on admission. Of the patients who complained of swelling, 147 (73%) had generalized oedema. All the four patients who convulsed had hypertension. Blood pressure was elevated in 138 patients (68%). The significant laboratory results

TABLE

*Presenting Symptoms in 202 Children with Acute Glomerulonephritis*

<i>Symptom</i>	<i>No of Cases</i>	<i>% of Total</i>
Swelling	202	100
Haematuria	57	28
Oliguria	45	22
Convulsion	4	2

were: (a) serum albumin less than 300mg/100ml (30g/L) in 57/129 patients (44%); (b) elevated ASOT in 30/60 cases (50%); (c) low C<sub>3</sub> in 62/85 (73%); (d) sera of 21/51 patients (41%) were positive for HBsAg, and (e) urica was high in 129/202 patients (64%).

#### *Management and Outcome.*

The duration of admission was 5-14 days in 60 of the patients. Management consisted of bed rest, daily measurement of blood pressure, restricted fluid intake and low salt diet. Frusemide was administered if there was any evidence of circulatory overload. Hydrallazine was given to patients with hypertension whose pressures did not return to normal with restricted fluid and

salt intake. All the patients received intramuscular penicillin for 7 to 40 days. Patients were discharged when the blood pressure and urine output were normal, oedema disappeared and there was no more gross haematuria.

There were three deaths. One patient died in acute renal failure on the second day of admission. The second death occurred in a patient with renal failure, pneumonia and persistently elevated blood pressure. The third patient died on the sixth day of admission, at a time when he was already showing evidence of recovery from acute renal failure. No permission was given for autopsy in any of these patients.

The default rate at follow-up was high: only 80 (39.65%) of the 202 patients attended the clinic four months after discharge and of these, 52 (65%) had no proteinuria, while 30 (37.5%) had no microscopic haematuria.

#### **Discussion**

The average prevalence of 50 cases of AGN per year indicates that the disease is a relatively common renal problem in Zaria children. The prevalence is about the same as that of nephrotic syndrome (unpublished data). This prevalence is higher than that reported previously from the same institution. AGN appears to be more frequent in Zaria than in other parts of Nigeria as well as elsewhere in Africa. Some 20 years ago in Ibadan, for example, Hendrickse and Gilles<sup>5</sup> reported 22 cases in about four years. In Enugu, 23 cases of AGN were admitted in one year.<sup>6</sup> Twenty-four cases were reported in two years in children in Kampala, Uganda.<sup>7</sup> However, none of these figures compares with an average of 124 cases of AGN per year seen in South African black children.<sup>1</sup>

The African child with AGN commonly presents with oedema, which may be generalised and severe, like a child with nephrotic syndrome. This similarity may give rise to diagnostic problems if, in addition, there is significant hypoalbuminaemia. In the present study, 44% of

the patients had serum albumin less than 300mg/100ml (30g/L). In the series reported by Hendrickse and Gilles,<sup>5</sup> the mean serum albumin was 170mg/400ml (17g/L) compared with a local normal mean value of 320mg/100ml (32g/L). Moreover, four of the 24 patients reported by Hutt and White<sup>7</sup> presented with nephrotic syndrome. In a subsequent study from the same centre, Wing, Kibukamusoke and Hutt<sup>8</sup> reported that 7.7% of their cases with nephrotic syndrome had clinical and histological features of post-streptococcal glomerulonephritis. The frequency of hypertension among African children with AGN is also high. In the present study, 68% of the patients had elevated blood pressure, compared with 45% of children in Ibadan,<sup>5</sup> and 61% in Ugandan children.<sup>7</sup> Whereas pyoderma/infected scabies was the most common antecedent infection in the earlier report from our institution,<sup>4</sup> in the present series, as well as in the series from South Africa,<sup>1</sup> pharyngitis was reported to be the common initial infection in Ibadan<sup>5</sup> and Uganda.<sup>7</sup> The reason for this difference is not clear.

In the present series, sera was positive for HBsAg in 41% of the patients. Obineche and Awunor-Renner,<sup>9</sup> in a study of adults with AGN in our institution, reported positive HBsAg in 41% of their patients and in only 10% of the controls. The prevalence of HBsAg in blood donors in Zaria is reported to be 44.4%.<sup>10</sup> The method of detection of HBsAg in all these three studies was counter-current immunoelectrophoresis. These findings suggest that either HBsAg is of aetiological significance in AGN, or that it is a marker of those likely to develop AGN after infection with *B-haemolytic streptococcus*.

Although the immediate outcome of AGN was good, it was not possible to assess the short term course of the disease because of the high default rate during out-patient follow-up. In most centres in Nigeria and perhaps, elsewhere in the developing world, patients are often reluctant to attend

the clinics for follow-up if they are asymptomatic, but still have the disease. AGN in Africa differs from the disease in developed countries with temperate climate in that there is a higher frequency of antecedent skin infection, generalised oedema and hypertension, as well as low serum albumin and association with HBsAg.

### Acknowledgement

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