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Prevalence of acute Post-streptococcal Glomerulonephritis in Port Harcourt.

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Summary

Eke FU and Nte A. Prevalence of acute Post-streptococcal Glomerulonephritis in Port Harcourt. *Nigerian Journal of Paediatrics* 1994; **21**: 32. Progressive and significant annual increase in the prevalence of acute post-streptococcal glomerulonephritis (APSGN) in Port Harcourt, was revealed in the present study of 113 cases, covering a period of eight years. There were more males than females, although this sex difference was not significant. There was a significant difference in the seasonal incidence of the disease, with more cases occurring during the dry than in the rainy season. Antecedent pharyngeal streptococcal infection occurred in 54.4 percent of the cases, while pyoderma occurred in 45.6 percent. Possible contributory factors to the increasing high frequency of APSGN in the present series, included a general decline in the economic status of low social classes of the population with large families. Complications associated with the disease included acute pulmonary oedema which occurred in 20.4 percent, hypertension in 63.7 percent and nephrotic syndrome in 29.2 percent of the cases. Mortality in the series was 2.7 percent.

Introduction

IN developing countries, acute post-streptococcal glomerulonephritis (APSGN) has remained prevalent, [1 2] while in other parts of the world, marked decline in the incidence of the disease has been reported.[3 4] The disease is one of the commonest causes of childhood hypertension, hypertensive encephalopathy and acute pulmonary oedema. Mortality from APSGN is reported to be between zero and 0.3 percent in some centres, but between two and three percent in Nigeria.[1] To the best of our knowledge, no long-term prospective study has been carried out here in Nigeria to evaluate the trend in the prevalence of this disease. As information on such a long-term prospective study of the disease can be most valuable, the present study was thus, undertaken so as to evaluate the prevalence and features of APSGN in Port Harcourt.

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Patients and Methods

Children with a clinical diagnosis of acute glomerulonephritis (AGN) who were admitted into the paediatric wards, University of Port Harcourt Teaching Hospital (UPTH), over a period of eight years (January 1985 to December 1992), were entered into a renal register that was opened in 1985. Relevant information obtained from each patient included history of presenting complaints (haematuria, oliguria, puffiness of the eyes, generalized body swelling) and previous sore throat or skin infection. The family size and social class [5] of the parents were also recorded. Each patient underwent a thorough and detailed clinical examination of the skin, throat, chest and abdomen; the weight, height and blood pressure (BP) were recorded. Diagnosis of AGN was based on a history of oliguria, haematuria, puffiness of the eyes, or generalized oedema of less than one week duration and the presence of granular and red blood cell casts in a fresh urine sediment. In addition to the above features of AGN, a diagnosis of APSGN was made, if there was evidence of antecedent streptococcal infection from either a positive throat or skin swab, rising ASO titre, or low serum C3. Patients with a history of either recurrent haematuria, or a history suggestive of a chronic renal disease were excluded from the study.

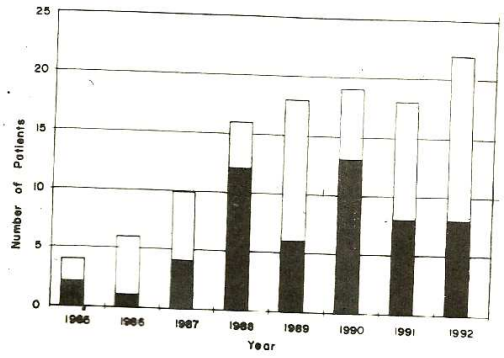
Freshly voided urine from each patient was obtained and tested for blood and protein, using the Multistix. The specimen was centrifuged and the sediment examined microscopically for casts. Throat swabs were taken from all the patients and skin swabs from those those with pyoderma; these swabs were sent to the microbiological laboratory for culture of organisms and antibiotic sensitivity. Blood was collected for urea, electrolytes, proteins, cholesterol, creatinine (Cr), antistreptolysin (ASO) titre, hepatisis-B antigen and full blood and differential counts. Serum complement (C3) was measured in only three patients. Chi-square and Student's 't' tests were used, where appropriate, to test the significance of the results.

Results

There were 116 patients (62 males and 54 females, sex ratio 1.2:1), aged between one year and 14 years who had AGN. Antecedent throat infection was documented in 61 patients, while pyoderma was found in 52 others. Culture of swabs from the throat yielded *Strep pyogenes* in 16 patients and from the skin infection in 37 other patients. Values of ASO titre in 87 patients ranged from 250 to 960 Todd Units (mean, 375 units). C3 was low in all the three patients in whom it was measured. There were therefore, 113 patients (97.4 percent) who had acute post-streptococcal glomerulonephritis (APSGN) out of the 116 patients with AGN. From a combination of a number of the above factors, namely: antecendent streptococcal infection, positive *Strep pyogenes* cultures, rising ASO titres and a low C3 in three patients, the contribution made by streptococcal pharyngeal and skin infections to these 113 cases of APSGN, was therefore, 61 (54.0 percent) and 52 (46.0 percent) respectively. These 113 patients (59 males and 54 females; sex ratio 1.1:1, $t = 0.6$, $p>0.5$) were aged between 1.25 and 14 years. Chest radiography of all the 133 patients revealed cardiomegaly. The mean serum urea was 3.5 mmol/L (range 1-55 mmol/L), creatinine 208 mmol/L (range 30-968 mmol/L), cholesterol 4.2 mmol/L (range 3-10 mmol/L) and sodium

133 mmol/L (range 129-139 mmol/L).

The annual and sex distribution of the 113 patients with APSGN (Fig) showed a progressive and consistent increase in the number of cases that were admitted per year; it also showed more male than female admissions each year. During the first year (1985) of the study, there were only four (4.9 percent) patients with APSGN, out of 81 cases of renal diseases, while in 1992, the last year of the study, there were 22 (22.7 percent) patients with APSGN out of 97 patients with renal disorders. Thus, there was a significant increase ($P<0.01$) in the prevalence rate of APSGN between the first and last year of the eight-year period of the study.



Annual and sex distribution of 113 patients with APSGN

During the cold dry season of the first year of the study (November 1985 through March 1986), there were four (66.7 percent) cases of APSGN out of six renal diseases, while there was no case out of 77 renal disorders that were seen during the rainy season (April through October). There was thus, a significant difference ($X^2 = 4.437$, $P<0.05$) in the seasonal incidence between the dry and rainy seasons. Similarly, there was a significant difference in the incidence between the 1992 dry and rainy seasons, as cases of APSGN numbered 21 (58.3 percent) out of 36 renal disorders and one (1.3 percent) out of 76 renal disorders, respectively ($X^2 = 39.74$, $P<0.001$).

Acute pulmonary oedema occurred in 23 (20.4 percent) of the 113 patients with APSGN. During the first four years (1985-1988) of the study, there were 36 cases of APSGN and of these, four (11.10 percent) presented with pulmonary oedema; during the second half (1989-1992), there were 19 (24.7 percent) patients who presented with pulmonary oedema out of 77 cases with APSGN. It is thus evident that there was no difference ($X^2 = 2.782$, $P>0.05$) in the prevalence of pulmonary oedema between these two periods. Hypertension, using normal pressures in children,[6] was found in 72 (63.7 percent) out of the 113 patients with APSGN. Nephrotic syndrome subsequently developed in 33 (29.2 percent) of the 113 patients. In the present series, 106 (94.0 percent) of the patients belonged to the social classes three to five, according to the classification by Miller.[5] The average family size was four (range 1 - 10). Two patients progressed to chronic renal failure, while two others required peritoneal dialysis. There were three deaths, a mortality of 2.7 percent.

Discussion

The present prospective study has clearly demonstrated progressive and significant annual increase in the prevalence of APSGN over the eight-year period of the study. Other workers[7] have reported that poor socio-economic and environmental factors, such as the weather, may contribute to increased prevalence of APSGN. It has been shown that in Nigeria, between 1978 and 1990, which corresponded with the period of

our present study, there was a general decline in the economic status of the entire population.[8] In the present study, 94.0 percent of the patients belonged to the low social classes three to five. With an average of four children per family, it is considered that the family size in our series was large. It may thus, be speculated that in the present study, the general decline in the economic status of the families belonging to low social classes with large family sizes was a major contributory factor to the observed increase in the prevalence of APSGN in and around Port Harcourt. Despite this observed increasihg prevalence of APSGN over the years, it is noteworthy that the clinical manifestations of the disease, including age incidence, symptomatology, signs and laboratory diagnostic features of the disease remained constant. The slight, but insignificant male preponderence in our series has been reported by others.[9] [10]

The signifcant difference in the seasonal incidence of APSGN in the present study, with more cases seen during the cold, dry season than during the rainy season, has been reported in Zaria by others.[11] It has also ben reported that epidemic types of APSGN, associated mainly with pharyngeal streptococcal infection, are usually seasonal,[12] while the sporadic types associated with pyodermal streptococcal infections, are non-seasonal. [1] [9] [10] [13] Pharyngeal streptococcal infection antecedence in the present study, occurred in 54.0 percent of the cases, while 46.0 percent of the cases were associated with pyodermal streptococcal infection. These findings are similar to those reported elsewhere,[14] but lower than those reported from some other African countries in respect of pyoderma.[1]

Complications from APSGN in our series included acute pulmonary oedema, hypertension and nephrotic syndrome. The frequency of pulmonary oedema in the present series, was higher than that reported by Seggie,[13] while the frequency of hypertension was similar to that reported by Aikhonbare and Abdurrahman.[9] The frequency of nephrotic syndrome as a complication of AGN was higher than in the series reported from South Africa,[2] but this complication was much lower in our series than that reported from Zaria.[9] The mortality of 2.7 percent in the present series was close to that of Bello in Ilorin.[1]

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