

Acute Glomerulonephritis in Children

Pages with reference to book, From 116 To 118

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Abstract

Acute glomerulonephritis (AGN) remains fairly common in the developing world although its frequency has declined in the industrial countries. The pattern of AGN was studied in one hundred hospitalised children. We recorded an increased prevalence in school age, i.e., 6-15 years (75%) and the occurrence of a streptococcal infection (90%), most often a pharyngeal infection (86%), one to three weeks preceding the illness. The problems that needed specific management during the acute phase were hypertension (39%), encephalopathy (5%) and ARF with hyperkalemia, 2% of the patients needing haemodialysis. Most of our patients (98%) recovered with 2% progressing to RPGN. The excellent prognosis of AGN with proper management emphasises the need for optimal care during the acute phase in the hospitalised children (JPMA 44:116, 1994).

Introduction

Acute glomerulonephritis (AGN) remains a fairly common disease in children in the developing countries. Problems that need management during the acute phase are hypertension, electrolyte imbalance, cardiac and/or acute renal failure. We studied the pattern of AGN in one hundred hospitalised children. The objective of the study was to identify the problems during the acute phase and to emphasise the importance of optimal management that would result in an excellent prognosis.

Patients and Methods

Case notes of one hundred patients who were admitted with AGN in the paediatric departments of two university hospitals in the north of Tehran during a period of four years (1987-1991) were included in this study. All files that were available and had satisfactory documentation of the data needed for this study, were accepted. The disease was studied as to its prevalence relative to age and sex, antecedent illness, ASO titres, common presenting complaints, significant laboratory tests, i.e., serum electrolytes, BUN, serum complement, creatinine, urinalysis, urine and throat cultures. Problems during the course of the disease and their management were reviewed along with the prognosis.

Results

Of one hundred children (55 boys and 45 girls) with AGN, 58 were from Tehran and 42 from other cities. Their ages ranged from 6 months to 15 years and 75% were between 6-15 years (Figure I).

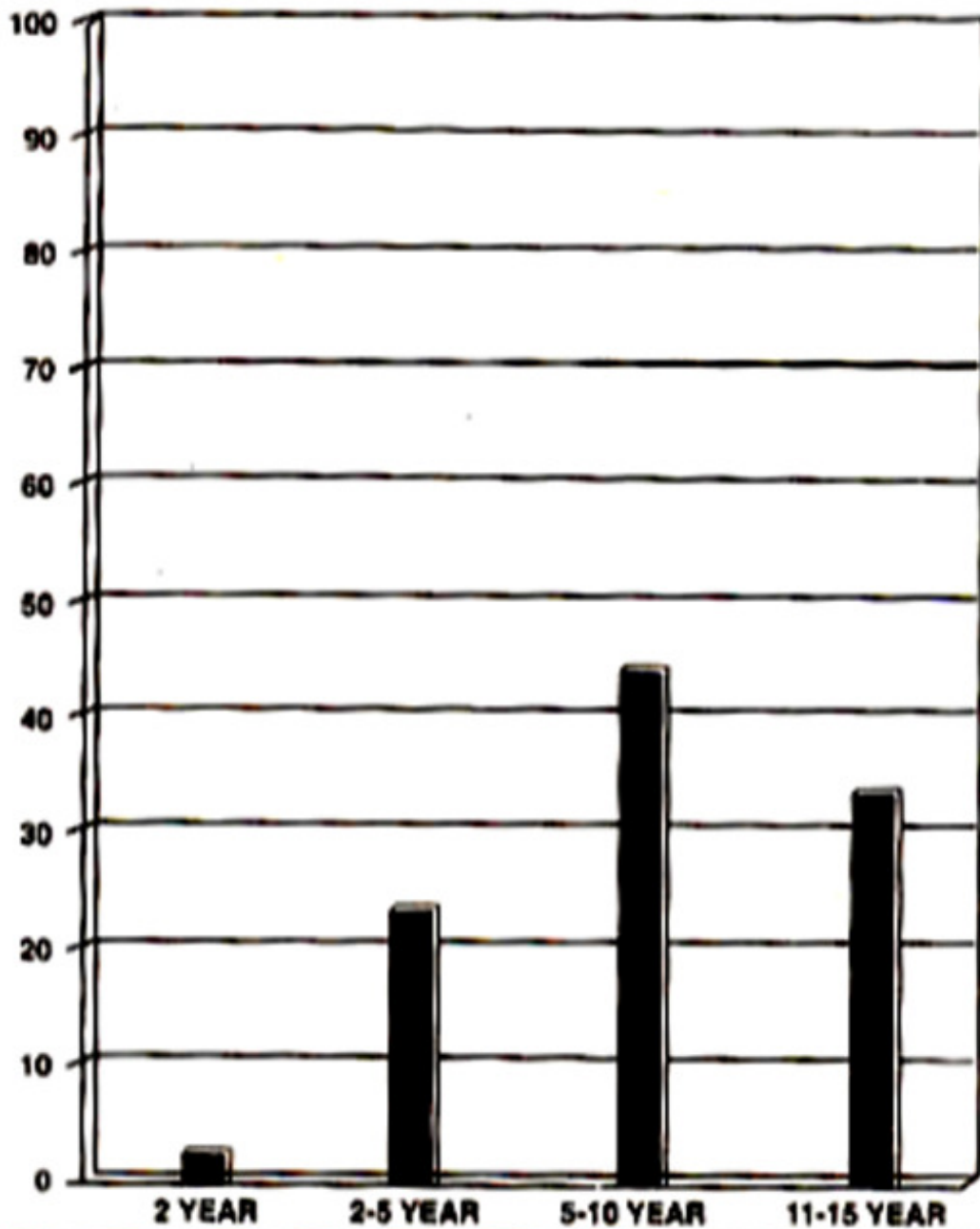


Figure 1. Acute glomerulonephritis in children incidence related to age.

Antecedent illnesses were measles 1%, varicella 1%, Henoch Schonleien purpura 1%, mumps 1%. Sixty-eight children had clinical evidence of acute pharyngitis, 12 had an ASO titer of > 500 Todd units without a history of a "sore throat", 7 gave a history of Scarlet fever and 3 had impetigo. This made a total of 90 children with clinical and/or laboratory evidence of a streptococcal infection. The common presenting complaints are summarised in Figure 2.

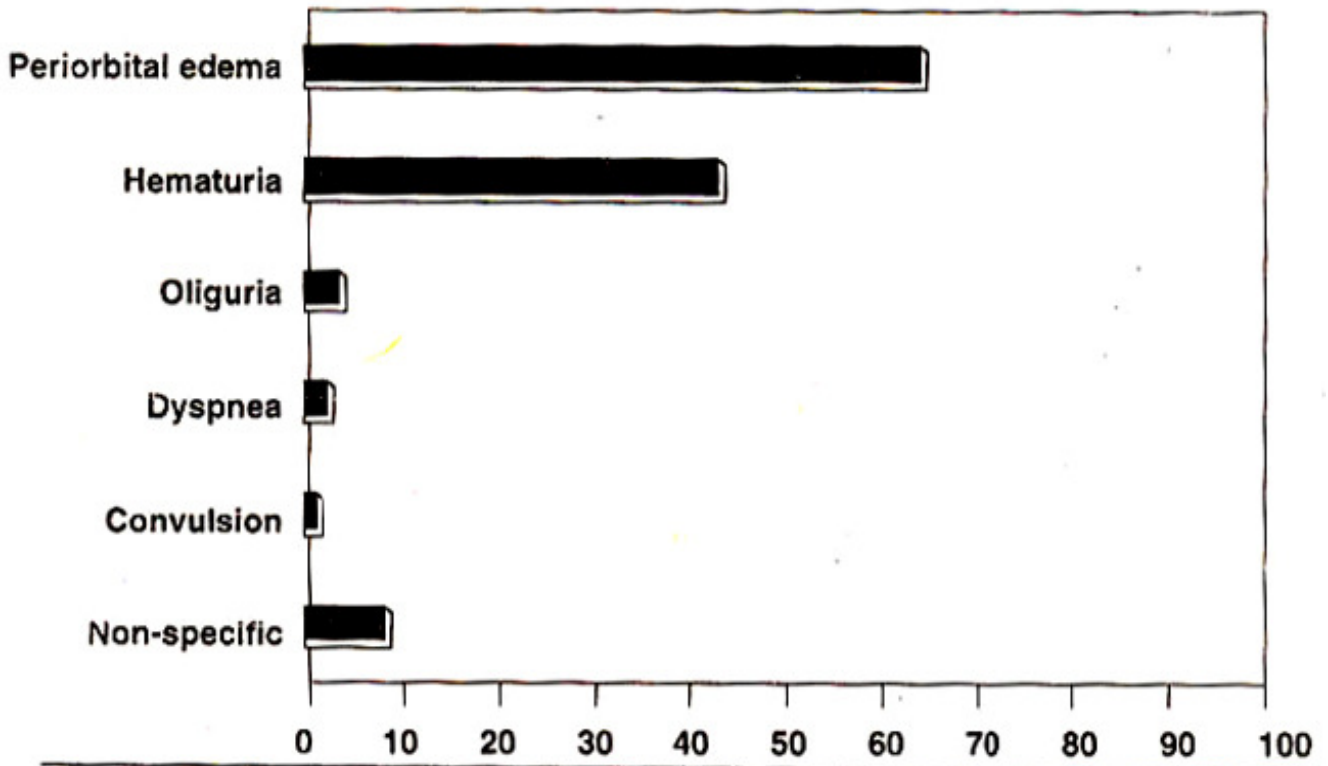


Figure 2. Chief complaints.

Clinical findings included hypertension, i.e., B.P. > 140/90 in 42%, encephalopathy 5%, congestive cardiac failure 3% and pulmonary edema 1%. Other signs and symptoms were fever 19%, arthralgia 4%, epistaxis 6% and bilateral papilledema 1% (Figure 3).

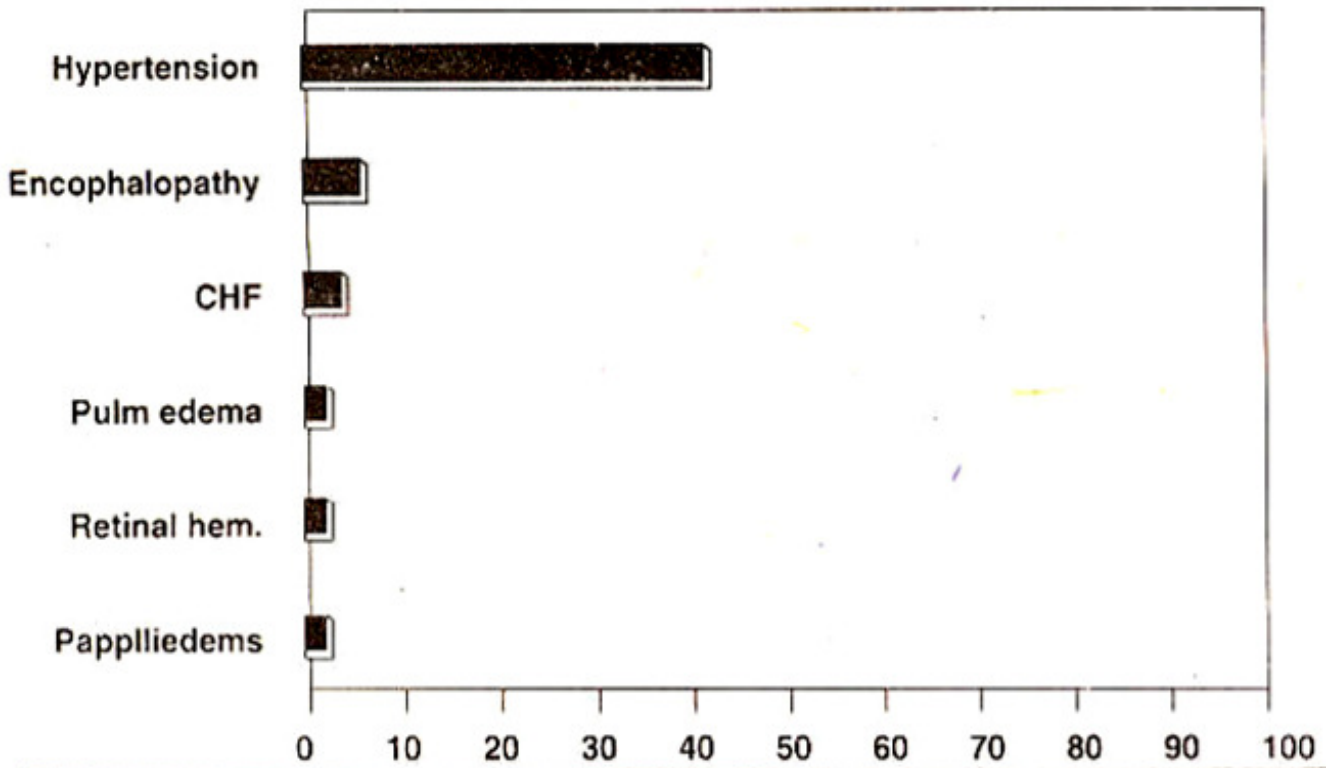


Figure 3. Clinical findings.

Laboratory investigations

Urinalysis showed haematuria in 90% and at least 1+ proteinuria in 77% of patients. Of particular interest was the level of serum Complement; C3 was tested in 43 patients out of whom 30 showed a decreased level. C4 was more variable as only 6 patients had a low C4 level. Fifty-one percent were given penicillin for a presumed or proven streptococcal infection. Thirty-nine percent needed antihypertensive drugs and in 3 patients reduction in salt intake controlled the blood pressure.

Discussion

Acute glomerulonephritis remains fairly common in the developing world; antecedent illness, most often an acute streptococcal pharyngitis precedes the disease. Incidence of post-streptococcal glomerulonephritis (PSGN) is following a downward trend in the industrialized countries and its frequency has so declined during the last decade that IGA nephropathy has replaced PSGN as the most common cause of haematuria¹. Most of the recent studies on PSGN were from the developing countries²⁻⁶. In this study 90% of the patients had clinical and/or laboratory evidence of a streptococcal infection, most often a pharyngeal infection. A study done by Roy and Stapleton⁷ on 95 children showed a changing pattern in children hospitalised with PSGN between the decades 1961-1970 as compared to 1979-1988; in that there was a decreasing incidence of PSGN during the later period and a predominance of antecedent pharyngeal infection in children over 6 years of age. The risk of PSGN is not eliminated by treating a "strept throat" with penicillin^{1,8}. Some of our patients had received penicillin prior to the illness. Most common complaint in this series was facial (periorbital) edema and oliguria was reported only in 6%. Keeping in view the other findings of AGN we presume that as most children were of school age, the decrease in urine output was not noticed by the child or his parent, Gross haematuria was reported in 42% but urinalysis showed haematuria in 90% and proteinuria was noticed in 77%. Depression of serum complement, C3 in 30 out of 43 patients who were checked indicates the involvement of the alternative pathway. Immunofluorescent 100 microscopy usually shows the appearance of "lumpy bumpy" deposits of immunoglobulin and complement on the glomerular basement membrane and the mesangium, but the precise mechanism by which streptococci induce complement formation remains to be determined¹. In the study by Matsell⁵, terminal complement components (TCC) were used as a clinical marker and generation of TCC was implicated in the pathogenesis of glomerular injury⁵. There is no specific treatment for AGN but most patients respond to supportive measures. Penicillin therapy is recommended to limit the spread of nephritogenic streptococci^{1,8}. Specific supportive measures are important in hospitalised children to prevent complications, especially when the acute phase is severe. Fluid and salt intake is limited and if necessary, loop diuretics are used⁸. Some patients need antihypertensive drugs as did 39% in this series. Hypertensive encephalopathy and pulmonary congestion are treated with parenteral drugs⁸. If acute renal failure supervenes with hyperkalemia and/or pulmonary edema hemodialysis is necessary⁸. In this study 2 patients needed hemodialysis because of hyperkalemia. With proper management complete recovery occurs in more than 95% of children^{1,5,8}. In our study 86% recovered within 2 weeks; in 6 patients gross haematuria and in 5 patients mild periorbital edema persisted for over 2 weeks with eventual recovery. Overall 98% had a complete recovery and 2% progressed to rapidly progressive glomerulonephritis (RPGN). Relapsing PSGN is rare as immunity to the M protein of nephritogenic streptococci is type-specific, long lasting and protective⁸. Only one child in this series had, a previous episode of AGN and none of the others returned with a relapse during the study period. We emphasise that the excellent prognosis of PSGN underscores the importance of proper management of the hospitalised children during the acute phase.

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