

Congenital and Idiopathic Nephrotic Syndrome

Background

Nephrotic syndrome is a common manifestation of glomerular disease in children. However significant questions concerning the incidence, aetiology, associated morbidity and treatment of nephrotic syndrome remain unanswered. This study aims to determine the incidence of nephrotic syndrome in Australian children. Of the overseas incidence studies, only one performed in the USA in the 1950s was population based. This indicated an annual incidence in children aged <16 years of 2 per 100 000.

Our study also aims to describe current management regimes, disease relapse rates and the spectrum of infectious and thrombotic complications in children with nephrotic syndrome. Information on the rates of adverse events will be used to determine the feasibility of randomised controlled trials of different treatment modalities and/or interventions to prevent complications of the disease.

Objectives

Idiopathic nephrotic syndrome

- To estimate the incidence of idiopathic nephrotic syndrome
- To describe its distribution in relation to age, sex, socio-economic status, geography and ethnicity
- To describe the steroid regimes and other treatments used in the first episode of idiopathic nephrotic syndrome
- To describe disease relapse rates amongst steroid responsive children
- To describe the frequency and type of infective and thrombotic complications

Congenital nephrotic syndrome

- To estimate the incidence of congenital nephrotic syndrome in Australia
- To describe its distribution in relation to age, sex, socio-economic status, geography and ethnicity
- To determine the presentation, management and short-term outcome of children with congenital nephrotic syndrome

Case definition

Idiopathic nephrotic syndrome

Any child aged > 3 months and < 15 years with oedema, proteinuria (> 3+ on dipstick), hypoalbuminaemia (serum albumin < 25g/L) and normal renal function (serum creatinine in normal range for age when not volume depleted) in the absence of persistent hypertension, systemic illness or macroscopic haematuria.

Congenital Nephrotic Syndrome

Any child aged < 3 months with oedema, proteinuria (> 3+ on dipstick) and hypoalbuminaemia (serum albumin < 25g/L).

Results and discussion

Between July 1998 and December 2000, 162 notifications of nephrotic syndrome were received (Figure 13). Of these, 104 were confirmed cases of idiopathic nephrotic syndrome and five had congenital nephrotic syndrome. Nineteen were duplicate reports, 27 were notification errors and seven questionnaires were not returned. A 96% return rate of initial questionnaires has been achieved.

Figure 13 Nephrotic syndrome notifications Jul 1998 - Dec 2000

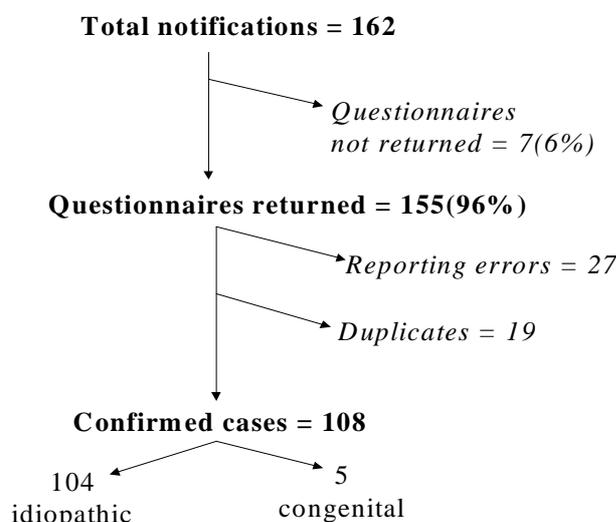


Table 23 shows the geographic distribution and reported incidence of idiopathic nephrotic syndrome.

Table 23 Geographic distribution and reported incidence of idiopathic nephrotic syndrome in Australia

State	Number	Incidence
NSW/ACT	42	1.27 (0.90-1.72)
VIC	26	1.09 (0.70-1.60)
QLD	16	0.84 (0.48-1.36)
SA	5	0.68 (0.22-1.60)
WA	12	1.20 (0.62-2.12)
TAS	3	1.12 (0.25-3.50)
NT	0	no reported cases
Australia	104	1.06 (0.87-1.29)

Incidence per 100 000 (95% CI) children aged <15 years

The national reported incidence was 1.1 (95% CI 0.9-1.3) per 100 000 children aged <15 years. There was no significant difference between states ($c^2 = 4.40$, $p = 0.62$). There were 59 boys and 45 girls giving an incidence of 1.2 (95% CI 0.9-1.5) for boys and 0.9 (95% CI 0.7-1.2) for girls- a difference which is not significant ($c^2 = 1.45$, $p = 0.23$). The incidence decreases significantly with age ($c^2_{trend} = 32.87$, $p < 0.0001$).

Sixty-eight of 104 (65%) children with idiopathic nephrotic syndrome had microscopic haematuria, 5/102 (5%) children had elevated serum creatinine in comparison with age adjusted normal ranges and 15/100 (15%) children had systolic and diastolic blood pressures elevated above the 95th percentiles for age at presentation. Twenty-seven of 104 (26%) children received pneumococcal vaccine. At the time of vaccination, 19/27 children were nephrotic and 21/27 were on daily steroids.

Antibiotic prophylaxis (predominantly with penicillin) was administered to 61/104 (59%) children. Twenty-seven children received both antibiotics and pneumococcal vaccination. Thirty-two of 104 (31%) children received aspirin. Albumin infusions and diuretics were given to 32/104 (31%) children; eleven received albumin alone and six received diuretics alone.

Ninety-six of 104 (92%) children with idiopathic nephrotic syndrome were treated with prednisolone or prednisone at a dose of 2 mg/kg/day or 60 mg/m²/day. Seventy-two of 104 (69%) children received one dose per day, 28/104 (27%) children two doses per day and 4/104 (4%) children three doses per day. Forty-two of 101 (42%) children received daily steroids for four weeks, eleven for six weeks, four for eight weeks and four for twelve weeks. Forty of 102 (39%) children received daily steroids until they achieved remission (34) or for two to three weeks (six).

Conclusion

The reported incidence of idiopathic nephrotic syndrome in Australia in children aged <15 years is 1.01 per 100 000. This is approximately half the incidence reported from a population based study in the USA in the 1950s and the reason for this is not clear. There are no significant differences between Australian states. These data need to be analysed in more detail for individual groups of countries to determine whether the incidence is higher in Asian, Indian and Arabic countries as suggested by previous non-population based studies.

There is considerable variation in the management of idiopathic nephrotic syndrome in Australia. For supportive management, this variation is not surprising since there are no randomised controlled trials of the use of antibiotic prophylaxis and pneumococcal vaccination to prevent infection, or of aspirin to prevent thrombosis in childhood nephrotic syndrome. Sixty percent of children reported received daily steroids for four weeks or more in line with previous evidence-based recommendations and a recent systematic review of randomised controlled trials. However, shorter courses of daily steroids were given to 40% children, potentially putting them at greater risk of relapse. These national data indicate that better systems are required to inform clinicians of results from randomised controlled trials which may assist them with decision-making.

Investigators

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