

# Risk Factor of Frequent Relapse in Pediatric Nephrotic Syndrome

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**Abstract Background.** Nephrotic syndrome (NS) is a kidney disease with high incidence. Although steroids therapy produces a good outcome with remission (80–95%), but the relapse rates are also high (60–90%). Relapsed NS patients experienced a long period treatment and become dependent on steroids, which might cause side effects such as short stature, overweight, osteoporosis, and cardiovascular disease. Some risk factors of relapse are age, late remission, first relapsed  $\leq 6$  months after remission, and short initial therapy. **Study design.** A cross-sectional study with retrospective data collection from medical record of patients with frequent and infrequent relapse nephrotic syndrome from January 2010 to December 2014. There were 90 patients which were divided in two groups, 45 frequent relapse and 45 infrequent relapse. Statistical analysis used bivariate and multivariate risk factor. **Result.** Boys:girls ratio was 4.6:1, with median age is 5 years and 5 month (65 months). From bivariate analysis, the first diagnosis  $\leq 5$  years ( $p < 0.001$ ) and time on remission  $\leq 6$  month ( $p < 0.001$ ) were the risk factor of frequent relapse. Multivariate analysis showed time on remission  $\leq 6$  month (OR 37.113, CI 95% (7.115–193.595)) more significant than the age at diagnosis  $\leq 5$  years (OR 8.0 CI 95% (2.402–26.645)) upon frequent relapse nephrotic syndrome. **Conclusion.** Time on remission  $\leq 6$  month and the age at diagnosis of NS  $\leq 5$  years were risk factor of frequent relapse in nephrotic syndrome patients.

**Keywords:** Nephrotic syndrome, frequent relapse, risk factor.

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## 1. Introduction

Nephrotic syndrome (NS) is a kidney disease with high incidence compared with other kidney disease. [1,2] Nephrotic syndrome incidence in Indonesia is 6 per 100.000 children per year on children age  $< 14$  years old, with boys:girls ratio is 2:1. [3] Nephrotic syndrome therapy using steroid has good outcome, remission on 80–95% patients, [4,5] however with high relapse incidence (60–90%) [6,7] with frequent relapse on 50–60% patients [6,8].

Relapsed NS patient experienced a long period treatment and became dependent on steroids, which might cause side effects such as short stature, overweight, osteoporosis, and cardiovascular disease, Cushing syndrome, psychologic disorder and decreased immune system [9,10].

Previous study found that age, gender, time of remission, low serum albumin and protein, delayed time on remission, short initial therapy, poor social economy class, and atopy were risk factor for frequent relapse in nephrotic syndrome [6,11].

Our study tried to find out the risk factor of frequent relapse nephrotic syndrome which will help to predict the relapse early and to reduce relapse in childhood NS.

## 2. Methods

### 2.1. Setting

This retrospective cross-sectional study was conducted in patients with frequent and infrequent relapse nephrotic syndrome at Dr. Hasan Sadikin General Hospital, Bandung, from January 2010 to December 2014. Subjects were selected by consecutive sampling.

### 2.2. Inclusion and Exclusion Criteria

Children age 1–14 years old who were diagnosed with frequent and infrequent relapse nephrotic syndrome and normal renal function were included in this study. Patient were follow up for at least 1 year. Exclusion criteria were incomplete medical record and laboratory examination. (Figure 1)

### 2.3. Case Definition

Nephrotic syndrome is a manifestation of glomerular disease, characterized by nephrotic range proteinuria and the triad of clinical findings associated with large urinary losses of protein: hypoalbuminemia, edema, and hyperlipidemia. [4,12] Relapsed was defined by proteinuria  $> 40$  mg/h/m<sup>2</sup> or  $> 50$  mg/kg/day or protein