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ORIGINAL ARTICLE

Rituximab for refractory cases of childhood nephrotic syndrome

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Abstract Rituximab has been used over the last decade as a rescue therapy for refractory cases of nephrotic syndrome (NS). Here we report the use of rituximab in four children with idiopathic steroid-resistant nephrotic syndrome (SRNS) with various histological backgrounds (two cases with focal segmental glomerulosclerosis, one case with IgM nephropathy, and one case with minimal change disease), who failed to respond to other immunsuppressions. Their median age (range) was 10 (8–11) years. NPHS2 genetic mutation was negative in all of them. All patients received a single dose of rituximab (375 mg/m^2) and achieved complete B cell depletion as CD19 was <1% for 3 months following rituximab infusion. Only one patient achieved non-sustained remission as he relapsed after 4 months despite zero CD19 level. Patients received no further doses of rituximab as B cell was depleted in the peripheral circulation. We conclude that a single dose of rituximab was not effective in inducing sustained remission in children with idiopathic SRNS, despite complete B cell depletion in the peripheral circulation. Further doses might be indicated to deplete non-circulating B cells.

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Introduction

The management of patients with steroid-resistant nephrotic syndrome (SRNS) remains a challenge facing pediatric nephrologists. The use of cytotoxic drugs, in association with steroids, improves the remission rate in SRNS [1–3]. However, a significant proportion of patients fail to achieve remission and progress to chronic renal failure [4, 5]. Furthermore, the potential toxicity of these drugs represents a concern that has triggered the search for other treatments. According to a recent Cochrane database review, cyclosporine significantly increased the number of children who achieved complete or partial remission compared with intravenous (IV) cyclophosphamide, placebo, or no treatment. There was no difference between tacrolimus versus cyclosporine [6]. However, hypertension and renal impairment are known complications of long-term therapy with calcineurin inhibitors [7]. Angiotensin-converting enzyme inhibitors (ACEi) significantly reduced proteinuria in these patients [6].

Over the last decade, rituximab has been used as a new therapeutic hope for SRNS [8–10]. Bagga et al. reported the successful use of rituximab in five patients with SRNS (three with focal segmental glomerulosclerosis (FSGS), and two with minimal change disease (MCD) [8]. Gulati et al. reported that 51.5% of 33 patients with SRNS achieved either complete (27.2%) or partial remission (21.2%) after rituximab therapy [9]. Nakayama et al. reported that a single dose of rituximab was an effective treatment for two children with refractory SRNS with FSGS [10].