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Case Study

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"Prednisolone's Therapeutic Role and Challenges in Managing Steroid-Dependent Nephrotic Syndrome"

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Abstract

This case study investigates the therapeutic application of prednisolone in the management of steroid-dependent nephrotic syndrome (SDNS) and the complications that come with it. Steroid-dependent nephrotic syndrome is a clinical quandary in which individuals relapse after reducing or discontinuing corticosteroid medication. In these circumstances, prednisolone, a routinely administered corticosteroid, plays a critical role in establishing and maintaining remission. The study looks on the effects of prednisolone on proteinuria, inflammation, and edema in patients with SDNS.

Keywords: steroid-dependent nephrotic syndrome, corticosteroid, inflammation, edema.

Introduction

Nephrotic syndrome (NS) represents one of the most researched kidney illnesses in paediatric patients, with a favourable prognosis and a remarkable drop in mortality (3% or less) [1]. It is an idiopathic condition distinguished by nephrotic protein urine (urine protein to creatinine levels of 200 mg/mmol, or 3+ proteins on urine test), hypoalbuminemia (serum albumin 3 g/dL), edema, and hyperlipidemia [2,3,4]. Steroid medication is effective in treating childhood nephrotic syndrome; nevertheless, 40–50% of individuals experience relapses often or develop steroid dependence [5]. Steroid-sensitive nephrotic syndrome (SSNS), steroid-dependent nephrotic syndrome (SDNS), and steroid-resistant nephrotic syndrome (SRNS) have been identified based on the response to corticosteroid therapy. The diagnosis of corticosteroid-dependent nephrotic syndrome is characterized by two consecutive relapses that occur either during or within 14 days of stopping medication. When a patient does not experience a full remission following eight weeks of steroid medication, they are considered first non-responder or steroid-resistant [3, 6]. In order to minimize the side effects of steroids, glucocorticoids should be administered everyday (60 mg/m2/day) for the initial four weeks of treatment, then 40 mg/m2 on alternating days for eight to twenty weeks. This is in accordance with the KDIGO guidelines [7].

Case study

A 2-year-old male child was hospitalized to a department of nephrology with the major complaint of decreased urine output since,two days and the complaint of facial puffiness, abdominal distension, and pedal edema since ,15 days. A high-grade fever with chills and rigors was reported. For the past three days, I've had loose stools. 1-2 episodes per day for three days.There was no mention of a cough, abdominal pain, or burning micturition. The patient had a similar complaint in the prior two episodes of steroid-dependent nephrotic syndrome. There is no history

of TB or epilepsy. No history of pregnancy-induced hypertension, preeclampsia, or fever and rash prior to delivery. The patient did not have a history of neonatal sepsis or NICU admission. absence of steroid-dependent nephrotic syndrome in the family history. The child had a blood pressure of 90/70 mmHg and a pulse of 112/min. There is no pallor, icterus, cyanosis, clubbing, or lymphadenopathy on general examination. According to laboratory investigations, albumin is 1.2 mg/dl,urine protein is 114.4 mg after 24 hours, INR levels is 3.7 and TSH is 3.18mIU/L.

Diagnosis

Two successive relapses while on alternating steroid medication or less than 14 days after stopping it.

Management

The patient is suffering with fever, Fepanil syrup 3ml was administered three times a day. Monitor the patient's temperature every six hours daily. Administer intravenous injection of ceftriaxone 50 mg/kg twice a day as an antibiotic. Oral Lasix 1 mg/kg tablet given twice daily as diuretic to treat edema. Prednisolone 2mg/kg tablet, once daily, for the treatment of steroid-dependent nephrotic syndrome. Calcium and vitamin D3 half tablet taken orally once a day to increase blood vitamin D levels.Iron folic acid half tablet given orally once a day. Daily weight of the patient monitor. Monitor patient weight daily.

Discussion

Prednisolone, a type of corticosteroid, is a vital factor in the medical management of nephrotic syndrome, particularly when the underlying condition is minimal change disease, which is the most frequent cause of the condition in children**.**Prednisolone has strong anti-inflammatory properties because it inhibits the synthesis of pro-inflammatory cytokines. This is critical in the treatment of nephrotic syndrome, which frequently involves an immune-related response affecting the renal glomeruli.Proteinuria (excess protein in the urine) is one of the key targets of prednisolone treatment in nephrotic syndrome. Lowering proteinuria relieves symptoms, prevents complications, and improves overall prognosis. When the dose of prednisolone is lowered or withdrawn in patients with steroid-dependent nephrotic syndrome, symptoms recur. As a result, prednisone is commonly used as an ongoing treatment to prevent recurrence and keep patients in remission.Long-term prednisolone use presents the problem of determining the lowest therapeutic dose that can sustain recovery while minimizing the risk of adverse reactions associated with extended corticosteroid therapy. Physicians can carefully modulate the dose to maintain efficacy while reduce side effects. Patients using prednisone for steroid-dependent nephrotic syndrome must be closely monitored by their doctors. This involves regular evaluations of the function of the kidneys, blood pressure, bone condition, and infection detection. The course of action may be modified based on the response of the patient and any new side effects.In circumstances where prednisolone alone is insufficient or side effects are of concern, healthcare practitioners may investigate other immunosuppressive drugs or therapies. Other drugs such as calcium channel inhibiting agents, mycophenolate mofetil, or rituximab may be included.

Conclusion

Corticosteroid therapy is still the primary line of treatment for children with nephrotic syndrome. Even at low doses, certain individuals with SDNS can sustain full recovery with prednisone therapy for a greater amount of time.

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