Case report

Icodextrin allergy in a peritoneal dialysis patient

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Introduction

Icodextrin may be used as an alternative to glucose as the osmotic agent in peritoneal dialysis patients with ultrafiltration failure [1,2]. It is a starch-derived glucose polymer with reduced absorption compared with glucose [3]. It has been shown to be safe and generally well tolerated [1–3]. Wilkie et al. reported three patients with a self-limiting rash affecting the hands, arms and trunk, and Lam-Po-Tang et al. reported a patient with a severe exfoliative dermatitis occurring 10 days after commencing icodextrin dialysis [1,4]. We report a further severe hypersensitivity reaction which recurred when the patient was rechallenged with icodextrin dialysis.

Case

A 61-year-old woman with adult polycystic kidney disease commenced continuous ambulatory peritoneal dialysis (CAPD) in November 1991. She had a history of urticarial skin reactions to a number of drugs, including penicillin, cephradine, co-trimoxazole, co-danthramer and a proprietary multivitamin preparation nephrovice. Initially she was commenced upon 3 × 2.5 l 3.86% glucose exchanges per day. In February 1994, she developed a severe *Staphylococcus aureus* peritonitis which required the removal of the CAPD cannula and temporary haemodialysis. The catheter was re-inserted in June 1994 but, due in part to the loss of residual renal function, she required 3 × 2.0 l 1.36% and 1 × 2.0 l 2.27% glucose exchanges per day. She acquired an α-haemolytic streptococcal peritonitis and subsequently developed further ultrafiltration problems requiring 4 × 2.0 l 2.27% glucose exchanges per day. In October 1997, she was chronically salt and water overloaded despite 3 × 2.5 l 2.27% and 1 × 2.5 l 3.86% glucose exchanges per day. A peritoneal equilibrium test (PET) revealed that at 4 h her creatinine (D/P) was 0.74 and her glucose (D/P) was 0.30, indicating a high average transporter. The drain volume was 2560 ml over 4 h on a 2.5 l exchange, and her adequacy of dialysis as measured by Kt/V was 1.75. She was placed on a 12 h nocturnal 2.5 l 7.5% icodextrin exchange with 3 × 2.5 l 2.27% glucose exchanges per day. After 14 days, she developed a generalized pruritic erythematous rash involving her chest, trunk, arms and legs. The rash initially was felt to be due to lansoprazole which she had recently been converted to from omeprazole which she had been on for over 3 years. The lansoprazole was stopped and omeprazole recommenced. Her condition continued to deteriorate over the following 7 days (see Figures 1 and 2). An allergy to icodextrin was suspected, and this was discontinued. Investigations at that time revealed a moderately elevated C-reactive protein 19 mg/l (<10 mg/l), a normal eosinophil count, and microscopy of the peritoneal fluid revealed one white cell per cm³, with no organisms seen. The pruritis and the rash settled within 7 days of stopping the icodextrin exchanges.

In view of the uncertainty of the aetiology of the allergic reaction, after obtaining informed consent, the patient was recommenced on a nocturnal icodextrin exchange. The pruritis and rash recurred after 8 days. She persisted with the icodextrin dialysis for a further 28 days but had to discontinue due to general malaise and a chronic interference with sleep. The rash once again resolved with in a week of stopping the icodextrin exchanges. The patients ultrafiltration problems persisted, therefore, an arterio-venous fistula was formed and she was commenced on haemodialysis once this had matured.

Discussion

In three cases of hypersensitivity to icodextrin reported by Wilkie et al., the dermatological reactions were limited and resolved spontaneously, enabling them to continue with their icodextrin exchanges [2]. In the case reported by Lam-Po-Tang et al., the patient developed a widespread exfoliative erythrodermic rash,
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Fig. 1. A photograph of the patient’s abdomen showing the erythematous macular rash after 21 days of icodextrin dialysis.

Fig. 2. The erythematous macular rash upon the patient’s legs 21 days after commencing icodextrin dialysis.

necessitating the withdrawal of the icodextrin exchanges and the prescription of an antihistamine [4]. In this report, we can be confident that the icodextrin was responsible for the allergic reaction due to the recurrence of the rash when the patient was rechallenged.

The icodextrin epitope responsible for the allergic reaction is unknown. Icodextrin is a glucose polymer which is metabolized via maltose to glucose [5]. Its structure is similar to the naturally occurring dextran, which is used as a plasma expander or an anticoagulant, and is responsible for a number of allergic reac-
tions including anaphylaxis [6]. The only structural difference between icodextrin and dextran is the polymer linkages α-1,4 and α-1,6 respectively. The incidence of pruritis is as high as 50% in patients treated with long-term dextran infusions [7]. It recently has been recognized that chronic exposure results in the deposition of dextran in the skin and the peripheral nerves [7,8]. This may stimulate the cutaneous nerves directly resulting in persistent itching.

Icodextrin is generally safe and well tolerated; however, it must be recognized as a possible cause of hypersensitivity reactions.

References


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