A new form of acute adverse reaction to icodextrin in a peritoneal dialysis patient

Sir,

Icodextrin is a large molecular weight glucose polymer fraction derived from hydrolysed corn starch which may be used in peritoneal dialysis patients as the osmotic agent [1]. The osmotic effectiveness of isosmolar icodextrin solution is well established [2–4]. Also, the use of icodextrin dialysis is generally safe and well-tolerated. Rare cases of allergic reactions to icodextrin dialysis, all characterized by the occurrence of rash, have been reported [4–6]. We now report a different form of adverse reaction to icodextrin, which was characterized by the lack of dermatological features and which recurred when the patient was rechallenged with icodextrin dialysis.

Case. A 59-year-old man was transferred from haemodialysis (HD) to peritoneal dialysis because of HD vascular access failure. The patient was started on regular HD treatment in January 1989. The cause of end-stage renal disease was chronic pyelonephritis secondary to renal stone disease. In April 1989, the patient underwent right nephrectomy for staghorn calculi. Since then, his blood pressure fell to average values of 80–70/50 mmHg. The dialytic history of the patient was mainly characterized by the difficulty to maintain a patent arterio-venous fistula or graft. The use of central venous HD catheters, either temporary or permanent, had also been troublesome. Therefore, due to exhaustion of potential sites for HD access placement in the upper and lower extremities, after obtaining informed consent, the patient commenced continuous ambulatory peritoneal dialysis after the insertion of a self-locating peritoneal catheter. Initially he was commenced upon 4 × 2 l 1.36% glucose daily exchanges. A peritoneal equilibration test (PET) revealed that his creatinine (D/P) was 0.55 and his glucose (D/P) was 0.50. Because of some ultrafiltration problems, the patient was placed on a 12 h nocturnal 2.0 l 7.5% icodextrin exchange with 3 × 2 l 2.27% glucose exchanges per day. However, about 4 h after the first infusion of icodextrin solution, the patient complained of abdominal discomfort followed by abdominal pain. On physical examination, there was distension of the abdomen and presence of peristalsis. Three hours after the beginning of abdominal symptoms, chills occurred followed by hyperthermia (38.3°C). Icodextrin solution was drained out: no organism was seen in the peritoneal fluid effluent, while white cells were 20 per mm³. Blood eosinophil count was normal. The reaction settled within one day.

Icodextrin dialysis was discontinued because of the suspicion of an adverse acute reaction to it. The patient was placed on a 4 × 2 l 2.27% glucose exchanges per day. A few months later, considering the uncertain aetiology of the adverse reaction and after obtaining informed consent, the patient was recommenced on a nocturnal icodextrin exchange. The abdominal pain and fever (39°C) occurred some hours after the infusion of icodextrin solution, making it necessary to stop icodextrin dialysis. The patient is now on 3 × 2 l 2.27% and 1 × 2 l 1.38% glucose exchanges per day.

Comment. In 1997, Wilkie et al. [4] and Lam-Po-Tang et al. [5] reported the first cases of hypersensitivity reactions in response to icodextrin dialysis. In the three patients reported by Wilkie et al. [4], a rash affecting the trunk, arms and hands occurred after commencing icodextrin dialysis exchanges but resolved spontaneously, so that icodextrin dialysis could be continued. Lam-Po-Tang et al. [5] reported the occurrence of a severe exfoliative erythrodermic rash necessitating the use of an antihistamine drug and the cessation of icodextrin dialysis. Withdrawal of icodextrin exchanges was also necessary in a more recent report because of a generalized erythematous rash, subsequently associated with general malaise and interference with sleep [6]. In these cases [4–6], the reaction to icodextrin occurred several days after commencing icodextrin dialysis.

The adverse reaction to icodextrin dialysis in the patient reported here differs from those reported previously. The appearance of side effects related to icodextrin exchange occurred within a much shorter time (hours vs days). In addition, our patient developed an acute reaction which was characterized by abdominal symptoms and fever and by the absence of any cutaneous lesion.

Adverse reactions to icodextrin may be attributable to its structural similarity to dextran, which can be responsible for a variety of allergic reactions including anaphylactoid reactions [7]. The two polymers differ only in their linkage of glucose molecules, α-1,4 for icodextrin and α-1,6 for dextran. Although the reason for the acute adverse reaction to icodextrin observed in our patient is as yet unknown, we are confident that icodextrin was responsible because of the recurrence of the reaction after rechallenge.

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