

Allergic Dermatitis Caused by Povidone Iodine: An Uncommon Complication of Chronic Peritoneal Dialysis Treatment

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Allergic dermatitis around the catheter exit site, caused by topical antiseptics such as povidone iodine and chlorhexidine gluconate, is an uncommon complication in patients on chronic peritoneal dialysis (CPD). As yet, published reports concerning this rare non catheter-related complication are few. The frequency of this type of dermatitis is not known, because reports of isolated cases constitute the only source of information.

Here, we report our clinical experience with 2 patients (2.3%) among the 86 children with end-stage renal disease who underwent CPD treatment at our center during the period between November 1995 and December 2004. These 2 pediatric patients developed allergic contact dermatitis, with extensive patchy and linear erythema around the exit-site area because of administration of povidone iodine solution. The symptoms subsided within a week in both patients after daily topical application of normal saline solution was started.

Allergic dermatitis caused by povidone iodine at the site of the catheter exit should be kept in mind as a complication in patients on CPD. Antiseptic solutions should be used cautiously in these patients.

Key words

Allergic dermatitis, povidone iodine, children

Introduction

Exit-site infection is a major risk factor for the development of peritonitis in chronic peritoneal dialysis (CPD) (1). For the prevention of exit-site infections, aseptic care is most important (2). Povidone iodine (PI), derived from polyvinylpyrrolidone iodine, is an

antiseptic widely used in patients on CPD. Use of povidone iodine has been reported to reduce the rate of exit-site infection (3). However, an uncommon complication in patients on CPD is allergic dermatitis around the catheter exit site caused by topical antiseptics such as povidone iodine and chlorhexidine gluconate.

As yet, published reports concerning this rare non catheter-related complication are few. The frequency of this type of dermatitis is not known, because reports of isolated cases constitute the only source of information. Here, we report our clinical experience with 2 pediatric patients on CPD in whom allergic dermatitis was associated with the application of PI.

Case reports

Case 1

A 5-year-old boy who had been on CPD for 3 months because of reflux nephropathy presented with extensive erythematous and eczematous rash of the skin around the exit site (Figure 1). He had had no peritonitis episodes within the CPD treatment period. Past medical history was unremarkable for allergic disease, trauma, and burn. On admission, no abdominal pain, vomiting, fever, or cloudy peritoneal fluid were detected. The boy's vital signs were within normal limits. Clinically, no indicators of adhesive medical plaster application on the skin around the catheter exit were present. Analysis of a dialysis fluid sample showed no cells. Cultures of the PD fluid and the pericatheter skin were negative.

Because topical PI had been applied weekly around the exit site, the lesion was suspected to be allergic contact dermatitis, probably induced by the topical application of PI. The symptoms subsided within a week of the removal of PI and substitution of



FIGURE 1 The appearance of extensive erythematous and eczematous rash around the exit-site skin.

daily topical application of normal saline solution (Figure 2). The boy underwent a successful cadaveric renal transplantation procedure 12 months later while clinically well.

Case 2

A 13-year-old boy maintained on CPD for 3 years as a result of amyloidosis presented with extensive erythematous rash of the skin around the catheter exit site. The rash had started 3 days earlier. The boy had had 3 episodes of peritonitis (the latest 2 episodes within preceding 2 months), all of which had resolved uneventfully with intraperitoneal antibiotics. He and



FIGURE 2 Normal appearance of exit-site skin after daily topical application of normal saline solution.

his parents had no past history of allergic disease. Medical history was also unremarkable for trauma, burn, and the use of adhesive plasters. No abdominal pain, vomiting, fever, and cloudy peritoneal fluid were seen on admission. The boy's vital signs were within normal limits. Analysis of a sample of dialysis fluid showed no cells, and cultures from PD fluid and pericatheter skin grew no bacteria. A detailed history revealed that, for the preceding week, daily exit-site care had been carried out using PI. That finding led us to the conclusion that the erythematous rash around the catheter exit was allergic dermatitis attributable to the PI solution. Topical administration of PI was stopped, and daily topical application of normal saline solution was started. The symptoms subsided within a week. At 15 months of follow-up, the boy remains well.

Discussion

Peritonitis and exit-site infection are the most common clinical problems that occur in patients with end-stage renal disease treated by peritoneal dialysis. However, noninfectious complications are generally related to catheter (1). Other uncommon noninfectious complications in patients on CPD are allergic complications around the catheter exit site; these are caused by topical antiseptics such as povidone iodine or chlorhexidine gluconate.

Chronic peritoneal dialysis implies the application of various topical substances such as antiseptics and contact with potential allergenic materials. Patients on CPD may present with contact dermatitis (allergic or irritant) as a consequence. The frequency of this type of dermatitis is unknown, because reports of isolated cases outside of CPD constitute the only source of information (4–8).

In our patients, no history of trauma, burn, or use of medical adhesive plasters was reported. The criteria for peritonitis (various combinations of abdominal pain, cloudy effluent, and fever) were not present, and the patients' peritoneal effluent was found to be free of cells. Signs or symptoms of the acute inflammation or discharge associated with exit-site infection were not present. No bacteria or fungi were isolated from the catheter exit or the peritoneal effluent. In both cases, these results supported our belief that the eczematous rash around the catheter exit was allergic dermatitis attributable to PI solution. Moreover, in both patients, the complaints had started after

PI application, and the symptoms subsided within a week after daily topical application of normal saline solution was started.

Injury to the skin attributable to PI has been reported both as mild (with only erythema) and as severe (with tissue necrosis and bulla formation). The patient may note a stinging or burning sensation with the onset of blisters or erythematous plaques that may spread from the area of contact to adjacent skin (9). However, in rare cases, PI can cause severe allergic contact dermatitis, generalized eruptions similar to erythema multiforme, and irritation of skin and mucous membranes (4–6). Furthermore, several cases of immediate hypersensitivity to povidone or PI have been reported in the literature (7,8). One case report described anaphylaxis after povidone iodine was applied intravaginally (10).

It is probable that our patients had previously been sensitized by the administration of PI or of other pharmaceutical preparations containing povidone as excipient. Povidone is used in preparations such as antihistamines, diuretics, and analgesics, among others, and allergic reactions to the compound are increasingly being reported (8).

The treatment for acute contact dermatitis, whether allergic or irritant, includes removal of the source; expression of pustules; irrigation with a drying, desquamating soap; and use of topical and systemic steroids as well as systemic antihistamines (9). In our patients, we stopped the application of PI solution and used normal saline solution instead. No other medication was used. The symptoms subsided within a week in both patients.

The use of skin prick and patch tests or controlled challenge has been advised to rule out the possibility of an irritant effect or to confirm a diagnosis of allergic contact dermatitis (6). Unfortunately, we could not perform such tests in these patients because their parents would not agree to the testing. Because discontinuation of PI and application of normal saline was effective in controlling the cutaneous lesions, the erythematous rash in these cases was most probably a manifestation of PI-induced allergy. However, the irritant effect of PI remains to be elucidated.

Conclusion

Allergic dermatitis caused by povidone iodine at the catheter exit site should be kept in mind as a devastating complication in patients on CPD. Antiseptic solutions should therefore be used in cautiously in these patients.

References

- 1 Gokal R. Peritoneal dialysis in the 21st century: an analysis of current problems and future developments. *J Am Soc Nephrol* 2002; 13(Suppl 1): S104–16.
- 2 Ludlam H, Dryden M, Wing AJ, Phillips I. Prevention of peritonitis in continuous ambulatory peritoneal dialysis. *Lancet* 1990; 335:1161.
- 3 Luzar MA, Brown CB, Balf D, *et al*. Exit-site care and exit-site infection in continuous ambulatory peritoneal dialysis (CAPD): results of a randomized multicenter trial. *Perit Dial Int* 1990; 10:25–9.
- 4 Okano M. Irritant contact dermatitis caused by povidone iodine. *J Am Acad Dermatol* 1989; 20:860.
- 5 Torinuki W. Generalized erythema-multiforme-like eruption following allergic contact dermatitis. *Contact Dermatitis* 1990; 23:202–3.
- 6 Tosti A, Vincenzi C, Bardazzi F, Mariani R. Allergic contact dermatitis due to povidone-iodine. *Contact Dermatitis* 1990; 23:197–8.
- 7 Gonzalo Garijo MA, Duran Quintana JA, Bobadilla Gonzalez P, Maiquez Asuero P. Anaphylactic shock following povidone. *Ann Pharmacother* 1996; 30: 37–40.
- 8 Lopez Saez MP, de Barrio M, Zubeldia JM, Prieto A, Olalde S, Baeza ML. Acute IgE-mediated generalized urticaria–angioedema after topical application of povidone-iodine. *Allergol Immunopathol (Madr)* 1998; 26:23–6.
- 9 Martini MC. Contact dermatitis and contact urticaria. In: Sams WM, ed. *Principles and practice of dermatology*. New York: Churchill Livingstone; 1990: 389–401.
- 10 Waran KD, Munsick RA. Anaphylaxis from povidone-iodine. *Lancet* 1995; 345:1506.

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