

Anaphylactic reaction to povidone in a skin antiseptic

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Povidone iodine (e.g. Betadine®) is a widely used antiseptic, because of its broad antimicrobial spectrum. Immediate-type hypersensitivity reactions after use have rarely been described, related to one component, polyvinylpyrrolidone (povidone, PVP, CAS no. 9003-39-8). We report a new case.

Case Report

A 56-year-old male presented with two wounds on the forehead and on the knee resulting from a fall. After disinfecting the wounds with Betadine®, the physician started to suture the forehead, without using local anaesthetic or latex gloves. The patient immediately felt pruritus on the knee, spreading to the whole body and associated with general malaise. He then developed generalized erythema and diffuse sweating. Tachycardia and a drop in systolic blood pressure (7 mmHg) prompted emergency treatment, but without adrenaline. The serum tryptase level

was 94 µg/l (normal: < 11.4 µg/l). The basal tryptase level was 3.7 µg/l, thus excluding mastocytosis.

Allergy tests were performed 6 months later. The open test with Betadine® gave a negative result, but the prick test gave a positive result (urtica 10 mm and erythema 25 mm; with histamine as a positive control, 5 and 22 mm, respectively). All single ingredients provided by the MEDA Pharma laboratory were tested: only the prick test with PVP 5% aq., further diluted 1/10 vol/vol, in water gave a positive result (urtica 7 mm and erythema 12 mm). Delayed reading of the tests showed negative results. Therefore, a grade II anaphylactic reaction to Betadine® induced by type I allergy to PVP was diagnosed.

Discussion

In 1995, Waran reported the first case of a grade III anaphylactic reaction to Betadine®, confirmed with a prick test (1). In 2003, Adachi described a grade III anaphylaxis case after vaginal application of iodine solution. Prick tests were positive for the product and PVP. The patient reported prior contact urticaria after using hair care products containing PVP (2). Several cases of anaphylaxis caused by PVP have been described during haemodialysis therapy with PVP present in the membrane, and after the use of hair care products or toothpaste (3, 4). However,

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the frequency appears low, considering the widespread use of PVP. In the survey by the Groupe d'Etude des Réactions Anaphylactoides Périopératoires (Surgery Anaphylactic Reaction Study and Research Group) between 1997 and 2004, PVP accounted for three immediate hypersensitivity reactions out of 786 analysed side effects, whereas the same study found no case caused by, for example, chlorhexidine.

It is essential to diagnose allergy to PVP, because it is used in many medicines in the form of tablets or

liquids (e.g., Fluvermal[®], paracetamol, penicillin, and doxycycline), in topical treatment preparations, and in cosmetic products (INCI name: PVP), and also in food (E 1201). Appropriate information should be provided to PVP-allergic patients and their physicians to avoid inadvertent prescription of a PVP-containing medication. Moreover, the patient must screen all cosmetics and other products to ensure strict avoidance of the ingredient. Finally, the adverse event in our patient demonstrates the need to be able to manage anaphylactic shock during routine treatments.

References

- 1 Waran K D, Munsick R A. Anaphylaxis from povidone-iodine. *Lancet* 1995; **345**: 1506.
- 2 Adachi A, Fukunaga A, Hayashi K et al. Anaphylaxis to polyvinylpyrrolidone after vaginal application of povidone-iodine. *Contact Dermatitis* 2003; **48**: 133–136.
- 3 Pedrosa C, Costa H, Oliveira G et al. Anaphylaxis to povidone in a child. *Pediatr Allergy Immunol* 2005; **16**: 361–362.
- 4 Bergendorff O, Hansson C. Urticaria and anaphylaxis to povidone in a paracetamol preparation. *J Eur Acad Dermatol Venereol* 2007; **21**: 573–574.