

CONTACT POINTS

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Key words: allergic contact dermatitis; anti-septics; chlorhexidine; delayed type allergy; patch test; sensitization.

Case

A 4-year-old boy was born with tetralogy of Fallot. He was operated at the age of 3 months, had a heart catheterization at the age of 4 years, followed by a surgical correction of a double-chambered right ventricle. 3 days after the last surgical intervention, a skin rash developed consisting of rather sharply demarcated arciform erythematous papular itchy lesions (Fig. 1), which was diagnosed as contact dermatitis. The lesions were located at the edges of plasters used during surgery and lesions had also developed at the site where the plasters were in contact with the skin.

He was treated with clemastine and a mild topical corticosteroid cream. Chlorhexidine had also been used for cleansing the skin for several days in the clinic. The itch disappeared within 8 days; the skin lesions totally disappeared after several weeks.

He visited the outpatient clinic of Pediatric Dermatology of the Erasmus MC-Sophia Children's Hospital 4 months after the surgery because of suspicion of a delayed type allergy to something that he was treated with during or shortly after the operation. All skin lesions had disappeared. He had also been treated with co-trimoxazole for 3 days after the operation. About 10 days later, he had developed a papular skin rash, which was diagnosed as a drug eruption. He never had skin problems before this event.

Patch tests using TRUE-test[®], supplemented with tixocortol-17-pivalate, budesonide, emollient, chlorhexidine digluconate 0.5% in alcohol 70% (red), Meditrace[®] ECG plaster, and Wereled Natuur Fonds (WNF) plaster (Dermo Care, Caresse Cosmetics, Haarlem, the Netherlands), were conducted. After 2D, the tests were removed. After D4 a 1+ reaction to chlorhexidine digluconate 0.5% in

Allergic contact dermatitis to chlorhexidine and para-amino compounds in a 4-year-old boy: a very rare observation

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Fig. 1. Rather sharply demarcated, partly arciform erythematous papular lesions at the left side of the trunk developing about 3 days after the surgery.

alcohol 70% (red) (Fig. 2), Meditrace, and WNF plaster were noted.

Supplementary patch tests with chlorhexidine digluconate 0.5% in alcohol 70% (red), chlorhexidine digluconate 0.5% in alcohol 70% (colourless), Meditrace plaster, WNF plaster, alcohol 70% with lavender oil, povidon iodine solution, and organic dyes were undertaken. Once

again at D4, a 1+ reaction to chlorhexidine digluconate 0.5% in alcohol 70% (red) and the Meditrace plaster were noted. Chlorhexidine digluconate 0.5% in alcohol 70% (colourless) and para-aminoazobenzene 1% in pet. also showed 1+ reactions. When the results of D2 and D4 were compared, the characteristic crescendo reaction of contact allergy was observed.



Fig. 2. Patch test reaction at D4: a 1+ reaction to chlorhexidine digluconate 0.5% in alcohol 70% (red) was observed.

Discussion

Chlorhexidine (1.1-hexamethylene bis [5(chlorophenyl)biguanide]) is an antibacterial compound, which is active against gram-positive and gram-negative bacteria even in the presence of body fluids. The chlorhexidine salts used most frequently in medicine are digluconate, acetate, and diacetate. It may also be used as a preservative in topical products.

Severe immediate Immunoglobulin E-mediated allergy to chlorhexidine is known. Recently, an IgE-mediated mechanism of allergy to chlorhexidine was confirmed in 12 patients (1). There are numerous reports of anaphylaxis appearing in surgical operations, wound cleansing, cystoscopy, urethral catheterization, or insertion of chlorhexidine-impregnated central venous catheters (2). An intra-operative anaphylaxis to a chlorhexidine polymer was reported in a 14-year-old boy (3).

Although chlorhexidine is widely used; allergic contact dermatitis has rarely been reported (4). To the best of our knowledge, this has never been reported before in a very young child, such as in our case of a boy aged 4 years. Garvey et al. (5) studied the risk of sensitization and allergy to chlorhexidine in health care workers. They did not identify allergies to chlorhexidine in any of the tested 104 health care workers with daily exposure to chlorhexidine or in the 74 additional individuals who completed a questionnaire. However, Barbaud et al. (6) reported that sensitization to antiseptics is probably not rare.

Gelmetti (7) advised that in skin cleansing in children antiseptics such as potassium permanganate or chlorhexidine can be added to the water in appropriate concentrations. The ideal paediatric detergent should be very mild in order to avoid irritant dermatitis and allergic dermatitis. Abeck et al. (8) treated 6 patients (3 children and 3 adults) with acute exacerbated atopic eczema with chlorhexidine-soaked dressings over a period of 3 days using the 'wet-pyjama' technique. Improvement in the skin lesions was observed.

In the boy reported here, an allergic contact dermatitis to chlorhexidine was established. The patch test results could be reproduced, and the characteristic crescendo reaction of contact allergy was observed.

Moreover, this boy had also been sensitized to para-aminoazobenzene. He also developed a skin rash about 10 days after treatment with co-trimoxazole. The spectrum of cross-reactivity between members of the 'para-amino' compounds is variable (9). Cotrimoxazole is a sulfonamide and occasionally cross-reactions with para-amino compounds may occur. Active sensitization may be a complication of patch testing. We did not perform patch tests with other para-amino compounds in our young patient because of this possible risk. The reason of positive patch test reaction to the plaster remains unresolved as yet. There was no positive reaction to colophony in the TRUE-Test. Perhaps the colour of the plaster contained an azo-dye, but we could not confirm this hypothetical explanation.

In conclusion, allergic contact dermatitis to chlorhexidine may occur in very young children, although it is very rare considering its frequent use in the health care.

We presented a 4-year-old boy with sensitization to chlorhexidine and para-aminoazobenzene and a skin rash after co-trimoxazole. Cross-reactions between 'para-amino' compounds and sulfonamides may occur. Allergic contact dermatitis to chlorhexidine is very rare in adults and has never been reported in very young children. Thus, it is not easily suspected. We recommend considering a delayed type contact allergy in children who present with skin reactions after surgery or other procedures in which antiseptics were used.

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