

Chlorhexidine allergy

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Key words

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Background

Sensitivity to disinfectants plays a major role in the everyday lives of many people. Allergies, however, are far less common. Taking a detailed medical history and appropriate diagnostic allergy testing including skin test and if available in vitro tests are crucial in the professional workup of allergic responses to disinfectants. Here we present a case of a classic type-I reaction to chlorhexidine-containing disinfectants, that was confirmed by skin prick testing and specific IgE detection.

Case report

Medical history

The patient presented to his dentist in August 2012 due to a dental abscess. The dentist performed an incision, irrigated the wound, and applied a disinfectant gel (Chlorhexamed® gel 1 %). Within 10 min of completion of treatment, the patient experienced pruritus, abnormal numbness, and generalized exanthema. Articulation problems also appeared. The patient waited and his status largely normalized over the course of the subsequent 4 h.

In October 2012, 2 months later, cystoscopy planned in the context of bladder-cancer follow-up and involving local application of mitomycin was performed by a urologist. As in the many examinations performed in preceding years, Instillagel® was used as the lubricating gel for urine catheter insertion. The symptoms described above reappeared within 30 min, this time significantly more marked in character. The patient did not report circulatory dysregulation, shortness of breath, or gastrointestinal symptoms.

General findings

The patient, who was of normal weight and height, was in a relatively good general condition at the time of examination. Comorbidities included type-2 diabetes, arterial hypertension, glaucoma, and bladder cancer.

Skin findings

No pathological skin findings were made at clinical examination.

Laboratory findings

Total immunoglobulin E (IgE) and specific IgE (sIgE) to chlorhexidine were determined as part of laboratory testing for allergies: chlorhexidine sIgE 1.29 kU/l, CAP class 2 (normal value: < 0.35 kU/l). Total IgE was normal at 95.7 U/ml (normal value: < 100 U/ml). In order to exclude a latex allergy, specific IgE was also determined here, with no abnormal findings.

Diagnostic Allergy Testing

Epicutaneous testing: In a first step and to assess risk, patch testing with local anesthesia, parabens, chlorhexidine, and other components of medical products was performed to identify a trigger of the anaphylactic response. No pathological findings were observed either at 48 h or at 72 h following testing.

Skin prick testing: Skin prick testing with the suspected substances was then carried out as part of further testing, yielding a positive test reaction for chlorhexidine gluconate solution 0.5 % after 20 min of observation in the form of wheal formation (7 mm) and mild erythema accompanied by local pruritus (**Fig. 1**). In comparison with negative and positive controls, this reaction could be classified as pathological.

Abbreviations

IgE	Immunoglobulin E
sIgE	Specific immunoglobulin E
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i> strains

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Treatment and course

Since the patient had already been on his way home on both occasions that the allergic responses had occurred, these responses had not been observed by a physician. Fortunately, the symptoms experienced by the patient were self-limiting and led to no severe immune response. At his next physician's visit, the patient reported the symptoms he had experienced, upon which the appropriate diagnostic steps were undertaken.

Discussion and conclusion

Chlorhexidine is a popular and widely used antiseptic agent, particularly in dentistry. It is most commonly used in the form of chlorhexidine digluconate. Due to its ability to bind to bacterial cell walls, where it causes precipitation of cytoplasmic proteins, chlorhexidine is an effective antiseptic. This effect is produced by damage to the bacterial permeability membrane. It has the advantage of being retained on the teeth and mucous membranes. Also relevant in this context is the agent's substantivity [1], meaning that it is almost 100% eliminated without absorption.

Outside the dental context, chlorhexidine is used for topical wound care, e.g., as a component in plasters as well as antiseptic creams and powders. It is also a tried and tested skin disinfectant. Among other things, it is also used in combination with mupirocin to eliminate resistant staphylococci (e.g., methicillin-resistant *Staphylococcus aureus* strains, MRSA) from the nasal vestibule [2].

Allergic reactions to chlorhexidine are relatively rare, particularly when one considers how widespread the use of the substance is in our living environment. Nevertheless, cases of contact allergies or even type-1 allergies are consistently reported in the literature [3, 4]. A total of 50 cases were reported in a 2004 literature review [5]. The clinical relevance of a suspected allergy can be investigated by means of skin testing (patch, prick, and intracutaneous tests). In addition to these tests, it is also possible to determine specific IgE against chlorhexidine [6]. Although chlorhexidine allergy generally presents with mild dermal symptoms, it can also cause life-threatening anaphylaxis in the case of renewed exposure [3]. Allergic urticaria has also been reported [7]. Initial symptoms generally appear 20–40 min following allergen exposure, as confirmed by the present case. Since chlorhexidine is not a pharmaceutical product, and therefore not documented during surgical or diagnostic procedures, it is quite possible that it may be overlooked as a causative agent in the onset of an allergic reaction. As a result, the patient's risk of a possibly fatal outcome upon re-exposure in the future is increased. Given its excellent disinfecting and biochemical properties [1]



Fig. 1. Skin prick test using chlorhexidine gluconate 0.5%

[2], the use of this substance is likely to continue increasing. Against this backdrop, the physician whose activities include allergology will undoubtedly encounter chlorhexidine allergies more frequently in the future.

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Conflict of interests

The corresponding author states that there are no conflicts of interest.

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