



## CASE REPORT

### CHLORHEXIDINE INDUCED CONTACT DERMATITIS: A CLINICAL RARITY

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#### ABSTRACT

**Introduction:** Chlorhexidine gluconate is a cationic biguanide compound that exhibits strong antimicrobial activity by destabilising bacterial cell walls and membranes. This case highlights the unusual presentation of contact dermatitis caused by a commonly used antiseptic liquid containing chlorhexidine gluconate. **Case Presentation:** An 8-year-old male presented to Dermatology OPD with an acute erythematous painful rash on the nape of the neck. The patient has a history of abrasion injury 2 days back for which the parent applied chlorhexidine-containing antiseptic liquid locally. The relationship between chlorhexidine and adverse drug reaction was assessed according to the WHO causality scale and was determined to be 'Probable/Likely'. The patient was managed by topical steroids and oral antihistamines. **Conclusion:** Our case contributes to the increasing evidence of chlorhexidine hypersensitivity in the paediatric population. Clinicians must be cognizant of the numerous possible contact sources with chlorhexidine-containing antiseptics and personal hygiene products containing chlorhexidine as a preservative. It is crucial to recognise catastrophic reactions that may occur due to chlorhexidine sensitisation.

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## INTRODUCTION

Chlorhexidine gluconate (CHG) is a commonly used antiseptic with broad-spectrum activity, effectively disinfecting skin and wounds. The cationic bisbiguanide moiety of CHG helps keratinocytes produce bacteriostatic and bactericidal effects from anionic bacterial cell wall interaction<sup>[1]</sup>. Chlorhexidine is being used more frequently, not just as an antiseptic and oral hygiene aid, but also as a preservative in various personal care products. As exposure to the agent becomes more widespread, reports of adverse reactions to it are on the rise. Chlorhexidine may produce a wide range of adverse effects, from mild irritant contact dermatitis to life-threatening reactions like anaphylaxis<sup>[2]</sup>. Contact dermatitis is a type of inflammatory eczema that occurs when the skin comes into contact with certain chemicals or metal ions, which can cause irritation or toxicity, sometimes involving an immune response from T-cells. Contact dermatitis is subdivided into irritant contact dermatitis and allergic contact dermatitis. Irritant contact dermatitis is a non-specific skin response to direct chemical damage by releasing mediators of inflammation predominantly from epidermal cells. Allergic contact dermatitis is a delayed (type 4) hypersensitivity reaction to exogenous contact antigens<sup>[3]</sup>. Irritant contact dermatitis can develop without any

previous exposure to the irritating substance. Conversely, allergic contact dermatitis is a delayed hypersensitivity reaction driven by T-cells, occurring only after the skin has already been sensitised to the allergen. Irritant contact dermatitis and allergic contact dermatitis can present in the same manner. Acute presentations include erythema, oedema, oozing, crusting, tenderness, vesicles or pustules while subacute and chronic presentations include crusting, scaling, hyperpigmentation and lichenification<sup>[3]</sup>.

## CASE PRESENTATION

An 8-year-old male presented to Dermatology OPD with an acute erythematous painful rash on the nape of the neck. The patient has a history of abrasion locally 2 days back for which the parent applied chlorhexidine-containing antiseptic liquid locally as usual. After topical application of the liquid, he developed an erythematous painful rash on the nape of the neck which has been increasing for the last 2 days (see Fig). The rash is localised and has no systemic manifestations. After performing a physical examination and extensive personal history, the condition was diagnosed to be a case of contact dermatitis. The patient attended Dermatology OPD where

topical steroids and oral antihistamines were given. The rash healed with exfoliation of the skin after 7 days. According to the WHO causality scale, the relationship between chlorhexidine and the adverse reaction was assessed and was determined to be 'Probable/Likely'.

#### Differential diagnosis

- Allergic contact dermatitis
- Irritant contact dermatitis
- Atopic dermatitis
- Seborrheic dermatitis
- Lichen simplex chronicus



**Fig. Erythematous rash on the nape of the neck—Chlorhexidine-induced contact dermatitis**

## DISCUSSION

Chlorhexidine can cause both immediate and delayed hypersensitivity responses, with effects varying from minor skin irritation to severe reactions such as anaphylaxis or even death. There are many products and medical devices containing chlorhexidine that are sometimes marketed without standardised labelling. Due to the various ways individuals can be exposed to chlorhexidine, there have been reports of both accidental and repeated allergic reactions<sup>[4]</sup>. Children commonly present with contact dermatitis due to environmental exposure to irritants or allergens. The diagnostic process considers the patient's symptoms, the appearance and distribution of the dermatitis and their history of exposure to potential irritants or allergens. The gold standard test in the diagnosis of allergic contact dermatitis is patch testing. It also helps to differentiate between allergic contact dermatitis and irritant contact dermatitis<sup>[5]</sup>. Besides patch testing, repeat open application tests with 2% chlorhexidine alcohol solution may sometimes be the most sensitive test to diagnose chlorhexidine hypersensitivity<sup>[7]</sup>. Before beginning treatment, it is essential to eliminate any suspected irritant or allergen from exposure. Furthermore, it is also important to restore the skin barrier and reduce skin inflammation through various treatments, such as emollients, topical corticosteroids, antihistamines, and in severe cases, systemic corticosteroids and immunosuppressants. Timely and proper intervention is crucial to avoid the worsening of the skin condition and to prevent it from becoming chronic<sup>[6]</sup>.

## CONCLUSION

This case highlights the unusual presentation of irritant contact dermatitis following the application of chlorhexidine gluconate containing antiseptic liquid in an 8-year-old male. Though rare, chlorhexidine-induced contact dermatitis has been previously recorded in medical literature<sup>[2,4,7]</sup>. Our case contributes to the increasing evidence of chlorhexidine hypersensitivity in the paediatric population. Clinicians should rule out chlorhexidine hypersensitivity when wounds worsen with chlorhexidine. Clinicians must be aware of the numerous possible contact sources with chlorhexidine-containing antiseptics and personal hygiene products containing chlorhexidine as a preservative. It is crucial to recognise catastrophic reactions that may occur due to chlorhexidine sensitisation.

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