

Declaration of interest

None declared.

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Chlorhexidine allergy: sources of exposure in the health-care setting

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Editor—Chlorhexidine is being used increasingly in the health-care setting to avoid nosocomial infections.¹ Allergic reactions to chlorhexidine are often severe, leading to urticaria, anaphylactic shock, and even cardiac arrest.^{2–3} The serious reactions have been reported to be preceded by milder reactions; therefore, allergy should be suspected when facing symptoms such as localized swelling or systemic rashes after exposure to chlorhexidine.^{1–4} Although considered a rare allergen, chlorhexidine is increasingly recognized as a cause of perioperative allergy in many countries, such as England and Denmark.^{3–5} Indeed, in Denmark it was recently reported that chlorhexidine caused 9.6% of all perioperative allergic reactions.⁵ As a result of the low frequency of the allergy, health-care professionals rarely have experience in preventing patients from exposure to chlorhexidine and are not aware of which products contain chlorhexidine. As a result, chlorhexidine-allergic patients can have serious reactions on accidental re-exposure after the diagnosis has been established.^{6–7} Therefore, we decided to conduct a study investigating which products contain chlorhexidine in hospitals in Copenhagen, Denmark.

In April 2013, we contacted the Hospital Pharmacy in the Capital Region of Denmark, which is the pharmaceutical supplier for all hospitals in the Copenhagen area. We used Anatomical Therapeutic Codes (ATC) to search for products containing chlorhexidine in the pharmacy's product catalogue. The ATC codes are used for classification of drugs and are controlled by

the World Health Organization. We searched for the following nine ATC codes, each of which represents a single indication or use of chlorhexidine: A01AB03, B05CA02, D08AC02, D09AA12, R02AA05, S01AX09, S02AA09, S03AA04, and D08AC52. This provided us with a list of all 42 chlorhexidine-containing products supplied to the hospitals by the pharmacy. Table 1 gives an overview of the product types, application sites, and declared concentrations used in the products.

As seen in Table 1, chlorhexidine was found in several products used perioperatively, such as skin disinfectants and urethral gels. The products mostly reported to cause allergic reactions are the urethral gels containing chlorhexidine, such as Instillagel® (Farco-Pharma GmbH, Cologne, Germany).^{3–8} However, there are other potential sources of exposure to chlorhexidine perioperatively, such as central venous catheters and skin-cleansing wipes. Chlorhexidine in these products is easily overlooked, but it may cause severe allergic reactions.^{6–7} These products are classified as medical utensils and are not distributed via the Hospital Pharmacy, and thus, they were not identified during our search. The Corporate Procurement in the Capital Region of Denmark distributes all non-pharmacological products, such as medical utensils, to the hospitals. In their product catalogue, there are currently more than 100 000 products, but a list of ingredients used in these products is not available. The only way of knowing whether a product contains chlorhexidine is to check the material safety data sheet of each product, which is very time

Table 1 Products containing chlorhexidine and their declared concentrations. *The pharmacy also supplied 20 and 85%, requiring further dilution before use

Application site	Product type	Declared concentration (%)
Mouth	Dental gel (n=2)	1–2
	Mouthwash (n=4)	0.1–0.2
	Thrush treatment (n=1)	0.1
	Tablet for pharyngitis (n=1)	5 mg per tablet
Urinary tract	Bladder irrigation (n=1)	0.02
	Urethral gel in combination with lidocaine (n=3)	0.05
Vagina	Cream (n=1)	1
Skin	Skin disinfectant (n=19)	0.05–4*
	Ointment, gel, or cream (n=3)	0.05–1
	Powder (n=1)	1
	Scrub (n=4)	4
	Dressing (n=1)	0.5
Eyes	Eye drops (n=1)	0.02

consuming. As described in a previous study, the declaration of chlorhexidine on central venous catheters can be difficult to find on the package; therefore, these products require special attention before inserting in a chlorhexidine-allergic patient.⁶ To complicate matters further, chlorhexidine is also used outside hospitals in pharmacies, by dentists, and as a preservative in cosmetic products. In Denmark in 2013, it was shown that 3.6% of more than 2000 cosmetic products contained chlorhexidine.⁹ Overall, this illustrates how difficult, if not impossible, it is to obtain a complete overview of chlorhexidine use in and outside the health-care setting.

After a high number of reactions to chlorhexidine reported in Japan, the Japanese Ministry of Welfare recommended in 1984 that the use of chlorhexidine should be prohibited on mucous membranes because of the risk of anaphylactic shock.¹⁰ As illustrated by Table 1, however, this recommendation is clearly not followed in other countries. With the increasing focus on reduction of hospital-acquired infections by use of disinfectants such as chlorhexidine, perhaps now is the time to re-evaluate the optimal concentrations of chlorhexidine needed to prevent infections.

In conclusion, we have found that chlorhexidine is used in many products in various concentrations in the health-care setting in Denmark. In line with the extensive use, chlorhexidine is increasingly recognized as a cause of perioperative allergic reactions.^{3–5} We hope that this small study can help health-care professionals to identify chlorhexidine-containing products. In the perioperative setting, exposure to chlorhexidine may be massive and from several different products simultaneously. We therefore recommend that anaesthetic personnel develop a strategy to identify chlorhexidine-containing products in their local hospital, thereby reducing the risk of accidental re-exposure and additional reactions among chlorhexidine-allergic patients.

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