Pitfalls of patch testing with glucosides

Sangeetha Shanmugam1, Mark Wilkinson1 and Stephen Kirk2
1Department of Dermatology, Leeds Teaching Hospitals NHS Trust, Great George Street, Leeds LS1 3EX, UK and 2Boots, Nottingham NG2 3AA, UK
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Glucosides are non-ionic surfactants formed by the condensation of fatty acids with glucose (1). They have cleansing and emulsifying properties, and are used in shampoos and soaps, as well as in leave-on products such as lotions, and sunscreen agents. They are completely biodegradable, making them ecofriendly. Although contact allergies to glucosides have been reported, they are uncommon (2–6). Many patients reported in the literature reacted to more than one glucoside, suggesting cross-reactivity between glucosides (3).

Objective
We aimed to investigate the prevalence of contact allergy to glucosides in our patient group and to identify cross-reactivity.

Methods
Caprylyl/capryl glucoside 10% aq., cetearyl glucoside 10% aq., coco glucoside 10% aq., decyl glucoside 10% aq. and lauryl glucoside 10% aq. were added to our facial series, which already included lauryl glucoside 3% pet., for a period of 6 months from January 2012 to July 2012.

Results
Three hundred and twenty patients attended during this period, of whom 157 were tested with our facial series. Two patients reacted to glucosides.

The first patient, a 38-year-old man with perianal dermatitis, reacted to cetearyl glucoside 10% aq. (D2−; D4+), together with fragrance mix I 8% pet., Myroxylon pereirae 25% pet., linalool hydroperoxide 1% pet., limonene hydroperoxide 0.3% pet., benzotriazole 1% pet., methylidibromo glutaronitrile 0.3% pet., iodopropynyl butylcarbamate 0.1% pet., di tertiary butyl hydroquinone 1% pet., and Disperse Blue mix (104/124) 1% pet. No relevance for the reaction to cetearyl glucoside could be established.

The second patient was a 27-year-old woman with facial eczema who reacted to lauryl glucoside 3% pet. (D2++; D4++), along with methylchloroisothiazoline/methylisothiazolinone (MI) 0.02% aq., MI 0.2% aq., linalool hydroperoxide 1% pet., and limonene hydroperoxide 0.3% pet. Apart from lauryl glucoside, the positive reactions were relevant, as these were obtained with wet wipes and personal care products that the patient was using.

Comment
Contact allergy to glucosides is rare in our population group. Although the positive reactions to glucosides were initially interpreted as allergic, the source of exposure could not be established in either case, raising the possibility of an irritant response.

The second patient had positive reactions to lauryl glucoside 3% pet. (+/+++) but not to lauryl glucoside 10% aq. Alkyl polyglucosides are sold as aqueous solutions, and the data sheet (7) for lauryl glucoside claims a 24-month shelf-life when it is kept at temperatures below 38°C, suggesting that a difference in stability between the formulations was not responsible for the discrepancy in the results.

The datasheet stated that lauryl glucoside had a pH of 11.5–12.5. Our aqueous dilutions had been buffered to pH 5.5–6.0 with citric acid during manufacture. We speculated that the pet. sample could be irritant if not adequately neutralized. Three different commercially supplied pet. samples yielded pH values of 4. 5, and 5.5,
respectively. This suggested the potential for an irritant response if the alkaline pH had been overcorrected. Personal communication with one supplier established that the supplied product was diluted in pet. without adjustment of the pH.

Positive reactions to glucosides in pet. and water have been reported in the literature (5, 6). However, the data sheet describes the products as being soluble in water but insoluble in paraffin oil and other solvents such as ethanol. Water may therefore be preferable as a vehicle. Although the optimal patch test concentration of glucosides is not established, testing with decyl glucoside in aqueous solution at 10% dilution did not cause an irritant reaction in 100 volunteers (6), and has elicited definite allergic reactions.

On the basis of our experience and review of the material characteristics, we would suggest testing patients with suspected dermatitis caused by cosmetics with glucosides in a buffered 10% aqueous dilution, but to bear in mind the potential for weak irritant responses, particularly when isolated reactions are seen without cross-reactivity (3).

References

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