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Dear Editor,

Alkyl glucosides (AG), of which decyl glucoside (DG) and lauryl glucoside (LG) are those most commonly implicated in causing allergic contact dermatitis (ACD), are surfactants increasingly used in a wide range of products, including cosmetics, sunscreens and foam wound dressings.[1] DG is also a stabiliser in the UV light filter methylene bis-benzotriazolyl tetramethylbutylphenol (Tinosorb® M) and is occasionally an undeclared constituent.[2]

The British Society of Cutaneous Allergy (BSCA) performed a retrospective multicentre audit, reviewing January-September 2019 data from clinical databases of thirteen dermatology units in the U.K. and Ireland. The frequency of sensitisation to DG and LG, and concomitant reactivity between them, were assessed. Patients with suspected ACD were patch tested to DG 5.0% in petrolatum (pet.) and LG 3.0% pet. (Chemotechnique Diagnostics, Vellinge, Sweden). Allergens were applied promptly after loading the chambers. Readings were carried out on day 2 and day 4 according to European Society of Contact Dermatitis (ESCD) guidelines. Late reactions were not assessed. The frequency of positive (1+/2+/3+), irritant, and doubtful reactions, and clinical characteristics of patients were recorded, including age, sex, atopy (atopic dermatitis, asthma and/or allergic rhinitis), and duration of the rash.

Ten centres (Bath, Birmingham, Cardiff, Cork, Dundee, Leeds, Leicester, Middlesbrough, Newport and Sheffield) tested 2,803 consecutive patients to DG and LG in an extended baseline series (Table 1). 41 patients (1.5%) tested positive to at least one glucoside and 15 (37%) had concomitant positive reactions to both DG and LG. DG showed positive reactions in 35 patients

(1.2%), irritant in 32 (1.1%) and doubtful in 4 (0.1%). LG showed positive reactions in 21 patients (0.7%), irritant in 20 (0.7%) and doubtful in 2 (0.1%).

Among patients with positive reactions to any glucoside, the mean age was 46.3 years. 26 (63.4%) were female. The median rash duration was 104 weeks. 27 (66%) were atopic. No occupational exposures were identified.

Relevance was established in 19 (46.3%) cases. This included 16 (45.7%) of 35 DG-positive and 10 (47.6%) of 21 LG-positive patients. Affected sites were the face (n=12), hands (n=6), legs (n=2), neck (n=2), trunk (n=2) and scalp (n=1). Ten had more than one body site affected. Implicated products included shampoo (n=6), sunscreens (n=4), shower gel (n=1), makeup remover (n=1) and face cream (n=1). Tinosorb M® containing DG was implicated in all 4 sunscreen patients.

In one centre (Edinburgh), DG was tested in 312 patients in the cosmetic series only; positive reactions were seen in 5 (1.6%) patients, irritant in 7 (2.2%) and doubtful in 2 (0.6%). In 3 centres (Edinburgh, Swansea, Truro), LG was tested in 447 patients in the cosmetic series only; positive reactions were seen in 8 (1.8%) patients, irritant in 9 (2.0%) and doubtful in 3 (0.7%).

AG are allergens of increasingly recognised importance. In the USA, a rise in positive reactions to DG was noted from 1.5% in 2009-2010 to 2.1% in 2015-2016, when tested in consecutive patients.[3] In the UK in 2013-2017, 1.04% of 2,796 selected patients tested to 5 AG, including LG and DG, had positive reactions to at least one glucoside.[2] In our study, 1.5% of consecutively tested patients were sensitised to DG and/or LG.

Concomitant positive reactions between DG and LG were found in 37% of patients. This may be due to cross-sensitivity due to structural similarities, or concomitant sensitisation as they are often present in the same products. A recent study suggested that both surfactants need to be tested to optimise detection of ACD.[4] We agree that the rate of concomitant reactions is not high enough to only test one screening glucoside in the baseline series. Other AG, such as coco, arachidyl or cetearyl glucoside, should be tested separately if ACD is suspected.

Most patients were female, which could reflect their higher use of cosmetics. Most patients were atopic. In patients with atopic dermatitis, an impaired skin barrier may enhance penetration of allergens, or conversely may lead to overinterpretation of some irritant reactions, and these certainly appear to be irritant allergens at standard patch test concentrations.[5] 'Doubtful' reactions should be repeat tested, or the patient undergo a repeat open application test, to verify whether they represent true ACD.

The ESCD recommended the addition of DG and LG to its baseline series in January 2019.[6] Both have been recommended for inclusion in the updated BSCA facial series.[7] In this audit, DG and LG, when tested in an extended baseline series, each had rates of positive reactions greater than 0.5% in consecutive patients. We suggest that these allergens be included in the BSCA baseline series.

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Table 1. Characteristics of patients with positive reactions (1+/2+/3+) to decyl glucoside 5% in petrolatum (DG) and/or lauryl glucoside 3% in petrolatum (LG) in 2,803 consecutively patch tested patients to an extended baseline series in ten centres in the U.K. and Ireland (Bath, Birmingham, Cardiff, Cork, Dundee, Leeds, Leicester, Middlesbrough, Newport and Sheffield). Results from selected patients tested to the cosmetic series only (Edinburgh, Swansea, Truro) were not included in this table. Atopic patients had a personal history of atopic dermatitis, allergic rhinitis and/or asthma. SD = standard deviation; IQR = interquartile range.

Category	Subcategory	DG	LG	DG and/or LG
Reaction	Positive	35 (1.2%)	21 (0.7%)	41 (1.5%)
	Irritant	32 (1.1%)	20 (0.7%)	
	Doubtful	4 (0.1%)	2 (0.1%)	
Patients with Positive Reactions Only		n=35	n=21	n=41
Characteristics	Age (years), mean ± SD	43.8 ± 21.9	53.3 ± 21.3	46.3 ± 21.7
	Female sex, n (%)	24 (68.5%)	13 (61.9%)	26 (63.4%)
	Duration of skin rash (weeks), median (IQR)	104 (52-416)	96 (32-129)	104 (52-416)
	Atopic, n (%)	24 (68.5%)	12 (57.1%)	27 (65.9%)
Relevance	Current	14 (40%)	8 (38.1%)	
	Past	2 (5.7%)	1 (4.8%)	
	Unknown	19 (54.3%)	11 (52.4%)	
	Cross-Reaction	0	1 (4.7%)	
Patients Where Relevance is Established Only		n=16	n=10	n=19
Products implicated	Shampoo	5 (31.3%)	5 (50%)	6 (31.6%)
	Sunscreen containing Tinosorb M	4 (25%)	0	4 (21.1%)
	Shower gel	1 (6.3%)	1 (10%)	1 (5.3%)
	Makeup remover	1 (6.3%)	0	1 (5.3%)
	Face cream	1 (6.3%)	0	1 (5.3%)
Body site affected	Face	10 (62.5%)	6 (60%)	12 (63.2%)
	Eyelid	1 (6.3%)	0	1 (5.3%)
	Lips	1 (6.3%)	0	1 (5.3%)
	Hands	6 (37.5%)	1 (10%)	6 (31.6%)
	Generalised	2 (12.5%)	1 (10%)	3 (15.8%)
	Neck	2 (12.5%)	2 (20%)	2 (10.5%)
	Leg	2 (12.5%)	1 (10%)	2 (10.5%)
	Trunk	1 (6.3%)	2 (20%)	2 (10.5%)
	Scalp	1 (6.3%)	1 (10%)	1 (5.3%)