

Can the reporting of adverse skin reactions to cosmetics be improved? A prospective clinical study using a structured protocol

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Background: The use of cosmetics is rising, and adverse reactions to these products are increasing. In Sweden, the Medical Products Agency (MPA) keeps a voluntary reporting system for such adverse reactions. However, the reporting is sparse, consisting almost only of cases with test-proven allergic contact dermatitis, thus under-reporting the more common irritant reactions.

Objective: The aim of the study was to try to improve the reporting system.

Patients and Methods: Dermatologists at 3 dermatology departments used a structured protocol during the clinical investigation of 151 consecutive patients reporting skin reactions to cosmetics. The protocol included symptoms, signs, affected body site, suspected products, and final diagnosis after patch testing. Based on clinical data and patch test results, a causality assessment for each product was made according to a protocol used at the MPA.

Results: Allergic contact dermatitis was found in 28% of the patients, and irritant reactions were equally common at 27%.

Conclusions: Using this structured protocol, the cases of irritant dermatitis were also reported, and it is recommended that such a protocol is used as a standard to improve the reporting of adverse reactions to skin care products.

Key words: adverse cosmetic reactions; cosmetic safety; cosmetovigilance; reporting system.
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The use of cosmetics (1) is rising, and in Sweden, the total sales increased from 7004 million SEK in 1997 to 11 573 million SEK in 2005 – an increase of 65% (2). Presently, there are more than 25 000 cosmetic products available on the Swedish market.

Adverse skin reactions to cosmetics may also be increasing. The self-reported prevalence of such reactions in the population was earlier around 12% (3–5), but in a recent epidemiological study in the UK, 23% of women and 13.8% of men had experienced some sort of adverse reaction to a personal care product over the course of 1 year (6).

Among people with self-reported sensitive skin, as many as 57% of women and 31.4% of men reported side-effects from using cosmetics or skin care products at some stage in their lives (7). In a group of 176 patients who saw a dermatologist with specific complaints of reactions to cosmetic products, 45% had dermatoses associated with cosmetics (8).

Contact dermatitis is the most commonly reported adverse reaction to cosmetics and can be of irritant or allergic nature or a combination hereof (5, 9–11). In the clinical investigation of contact dermatitis because of suspected adverse

reactions to cosmetics, skin patch testing is necessary. When specific products are suspected, patch testing should be performed with both the products and their ingredients if possible (12–14).

In 1989, a voluntary adverse reaction reporting system for cosmetics was introduced at the Swedish Medical Products Agency (MPA) (15). This reporting system is similar to the system regarding adverse effects of drugs. The number of reports to the MPA is few in relation to the expected number of cosmetic adverse effects judged by the prevalence of self-reported reactions in Sweden (5, 15). The adverse reactions reported have been almost exclusively those with a positive patch test for the product or some of its ingredients. It can thus be anticipated that the irritant reactions, which are the most frequent ones (10), are not being identi-

fied and reported. It has also been proposed that adverse reactions to cosmetic products are underestimated in clinical dermatological practice (16).

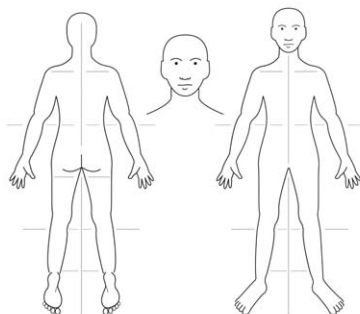
The aim of the present study was to evaluate if the classification and assessment of adverse skin reactions to cosmetics can be improved as a base for an improved system for the reporting of such reactions. To do this, the participating dermatologists were asked to make the clinical evaluations of the adverse effects using a standardized protocol. They were also to perform a causality assessment of the relation between the skin reactions and the suspected products according to a protocol used at the MPA (15). Data from the new protocol and all patch test protocols, including those with negative results, were analysed and are presented.

Protocol for the assessment of adverse effects of cosmetics

Name _____ **Age** _____ **Gender** _____

Signs Itching Burning Erythema Papules Vesicles
 Scaling Pustules Fissures Urticaria Other

Body distribution



Diagnosis:

Eczema	Allergic
	Irritant
	Atopic
	Seborrheic
	Hyperkeratotic
	Other
Other	

Suspected products:

1	2
3	4

Causality assessment **Prod 1** **Prod 2** **Prod 3** **Prod 4**

Certain
Probable/likely
Possible
Unlikely
Conditional/Unclassified
Unassessable/Unclassifiable

Fig. 1. Protocol for the assessment of adverse effects of cosmetics.

Table 1. Causality assessments for the 533 products divided in product groups^a

Causality assessment	Certain	Probable/ likely	Possible	Unlikely	Conditional/ unclassified	Unassessable/ unclassifiable	Total	A %
Product group								
Moisturizers	12	10	33	130	1	17	203	27
Eye make-up	3	23	26	56	0	7	115	45
Lip make-up	1	3	9	32	1	6	52	25
Facial foundations	1	4	7	18	0	5	35	34
Others	2	0	7	24	0	2	35	26
Perfumes and aftershaves	0	4	3	14	0	3	24	29
Nail varnish	4	2	3	12	0	2	23	39
Hair care products	0	2	10	5	0	2	19	63
Soaps	2	2	1	10	1	1	17	29
Toothpastes	0	0	0	5	0	1	6	—
Depilatories	0	0	1	0	0	0	1	—
Deodorants	0	0	1	0	0	0	1	—
Hair dyes	0	0	0	1	0	0	1	—
Barrier creams	0	0	1	0	0	0	1	—
Total	25	50	102	307	3	46	533	33

^aA, percentage of products with a causal relationship assessed as certain, probable/likely, or possible.

Patients and Methods

3 dermatology clinics in Sweden (Gothenburg, Uppsala, and Örebro) participated in the study. During a period of 24 months, 151 consecutive patients (15 males aged 11–63 years, median 36 years and 136 females aged 13–86 years, median 42 years) under investigation for suspected cosmetic adverse skin reactions were included. The patients were patch tested with the Swedish standard series, their own products, and in some cases, product ingredients. The products were patch tested in accordance with published recommendations (11) using the Finn Chamber[®] technique. The test panels were applied for 2 days and were read at D3 and D5–7. Using a structured protocol (Fig. 1), the dermatologists reported symptoms, signs, affected body site, suspected products, and, after patch testing, the final diagnosis. Taking together the clinical data and patch test results, a causality assessment for each product was made using a modified form of the WHO

definitions for suspected adverse drug reactions ('certain', 'probable/likely', 'possible', 'unlikely', 'conditional/unclassified', and 'unassessable/unclassifiable') (15).

Statistical analysis

Correlations between diagnosis and causality assessment were calculated using Spearman's rank sum test.

Results

The 151 patients reported use of 533 products in total. The most commonly reported products were moisturizers and eye make-up (Table 1). Most patients were tested with 1–3 products, but 1 patient brought as many as 40 products. Combinations of symptoms and signs compatible with contact dermatitis were by far the most common (Fig. 2). The face was the most commonly affected body site especially among females, while the

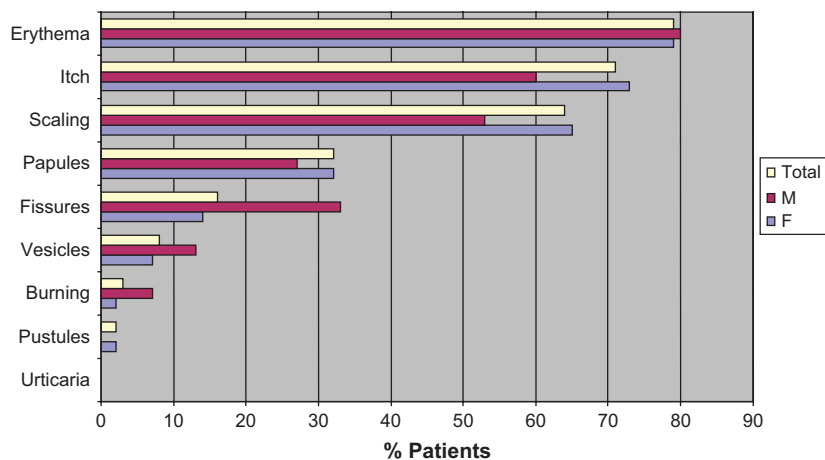


Fig. 2. Reported symptoms and signs. Note that most patients had >1 symptom and sign.

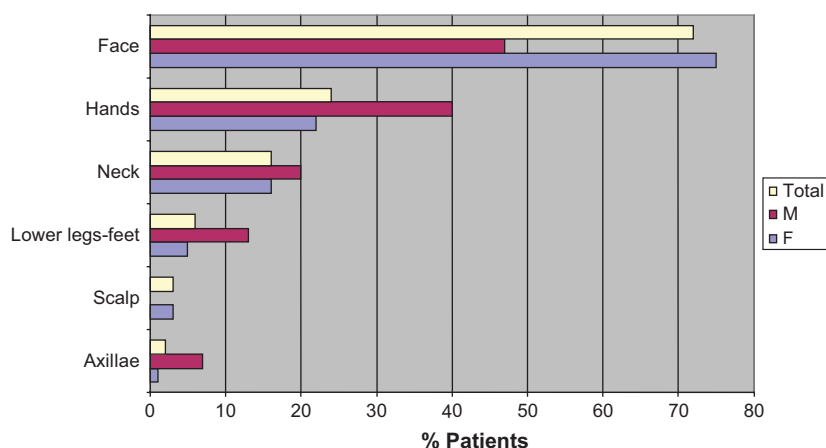


Fig. 3. Affected body sites. Note that some patients had >1 affected site.

second most commonly affected site, namely the hands, predominated among men (Fig. 3). Among the 530 products that were tested, 45 (8%) were recorded as positive (Table 2). The final diagnoses made after patch testing are given in Table 3. Irritant dermatitis (41 cases, 27%) was as common as allergic contact dermatitis (42 cases, 28%). In Table 1, the causality assessment of the adverse reactions is given for each product group. From Table 2, it can be seen that most of the products assigned with the causality assessment 'certain' were positive in the patch test (22/24, 92%). For products with weaker causality assessments, negative patch test results predominated (439/458, 96%). Statistical correlations were found between allergic contact dermatitis and causality assessment 'certain' ($P = 0.0003$) and between irritant contact dermatitis and assessment 'probable/likely' ($P = 0.016$) and 'possible' ($P = 0.013$).

Discussion

The number of reports of adverse skin reactions because of cosmetics to the MPA in Sweden is sparse in relation to the actual prevalence in the population (15). Most of the reported reactions are associated with positive patch tests, i.e. they

are considered to be allergic contact reactions. In the present study, a structured protocol (Fig. 1) based on daily clinical work was used. The only added procedure was the performance of a causality assessment by the investigating dermatologists. 8% positive patch tests were recorded, and those cases would probably have been reported anyway. However, using the structured protocol, several products (114/466, 24%) that were classified as 'probable/likely' or 'possible' causes of adverse skin reactions without showing positive patch test results were also reported. These products would, in all probability, not have been reported according to our 18-years' experience of the current reporting system at the MPA.

In population-based studies, some cosmetic products, such as deodorants and hair dyes, are often reported to cause side-effects (5, 17). In the present clinical study including people seeking medical advice, these products do not appear to be a problem.

During recent years, reporting systems have been discussed in other countries (18). The possibility of having a common system for the countries within the European Union is being discussed, and recently, the Council of Europe has recommended a vigilance system for undesirable effects of cosmetic products (19). The present

Table 2. Causality assessments in relation to patch test results and number of products

Patch test results	Negative	Positive (+, ++, +++)	Irritant reaction	Not tested
Causality assessment				
Certain	2	22	1	0
Probable/likely	25	13	9	3
Possible	89	7	6	0
Unlikely	303	2	2	0
Conditional/unclassified	3	0	0	0
Unassessable/unclassifiable	44	1	1	0
Total	466	45	19	3

Table 3. Final diagnoses and number of patients^a

Diagnosis	Females	Males	Total
Allergic contact dermatitis	41	1	42
Irritant dermatitis	37	4	41
Unspecified eczema	33	5	38
Atopic eczema	29	4	33
Seborrhoeic eczema	7	1	8
Others (e.g. psoriasis and rosacea)	10	3	13

^aSome of the patients, except those with unspecified eczema, had >1 diagnosis.

study demonstrates that the use of a simple structured protocol can improve the assessment of suspected adverse skin reactions caused by cosmetics, and such a protocol is recommended to improve the reporting of these reactions, especially the irritant ones.

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