

Diagnostic patch testing – does it have a wider relevance?

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For the dermatologist facing a patient with a suspected allergic contact dermatitis, the application of a baseline patch test series, possibly supplemented by additional selected substances based on the history, represents a key component of their diagnostic 'toolbox'. Of course, it is well recognised that positive patch tests identify whether a patient has contact allergy to a substance, but, by themselves, do nothing to determine whether it has relevance for the eczema which led to the consultation. That must come from the clinical history, evidence of relevant exposure and the experience of the dermatologist. Such matters have been the subject of many publications (e.g. 1, 2).

However, outside of medicine there are groups that are impacted by (collated) results from diagnostic patch testing. Typically these are individual industries, or industry groups, for whom this clinical information implicates substances of relevance to their industry as contact allergens. Experience has shown that these groups are often reluctant to embrace this clinical data and/or find it difficult to understand how to make it relevant for their (day to day) business.

So, what does this diagnostic patch test offer?

- the first indication that exposure to a substance is causing allergy in the population
- a means to compare the relative importance of contact allergens in terms of the frequency of reactions
- a means of following contact allergy trends over time

What does diagnostic patch test data not do?

- prove what exposures caused the induction of contact allergy
- give any dose-response information
- inform on what types of exposure may be tolerated, either for induction or elicitation

It is instructive to consider an example, one which is particularly clear cut – hydroxyisohexyl 3-cyclohexene carboxaldehyde (HICC). This is an entirely synthetic fragrance chemical and therefore the only possible exposure arises from its use as a fragrance substance. Data from diagnostic patch testing first suggested it was emerging as a contact allergen in 1990s (3, 4). Subsequently, patch testing in many clinics showed

that through its use it had become a leading cause of contact allergy (reviewed in 5). There can be no debate here – this substance causes contact allergy from exposure associated with fragrance use. What can be debated is the extent to which HICC contact allergy is relevant for a current eczema (i.e. allergic contact dermatitis), the likely answer being somewhere between 30% and 70% of cases. It is constructive to contrast this with a second example, that of methyldibromoglutaronitrile (MDBGN). This preservative caused high frequencies of sensitisation in Europe and this triggered regulatory intervention, initially to restrict its use to rinse-off cosmetic products and then prohibition from use in all cosmetics in Europe. A stepwise reduction in the frequency of contact allergy to MDBGN has followed; it is now uncommon. This suggests that contact allergy was relevant to the dermatitis in those individuals investigated and that the induction of contact allergy occurred via exposure to MDBGN in cosmetics. The Scientific Committee on Consumer Safety (SCCS) of the European Commission is of the opinion that HICC is not safe for use in cosmetic products (6) and should be subject to the same ultimate fate as MDBGN.

A fallacy of the interpretation of clinical patch test data is that repeat patch testing is a significant cause of contact allergy. In reality, in clinical practice it is uncommon for individuals to be patch tested more than once, and rare for them to be patch tested on three or more occasions with the same contact allergens. Furthermore, even with potent sensitisers, such as *p*-phenylenediamine, the risk of the induction of sensitisation is <1% (7). For most skin sensitisers, the risk of iatrogenic sensitisation is extremely low, such that for practical purposes this cause of the induction of contact allergy does not contribute to the data.

However, the most common non-dermatologist criticism of diagnostic patch test data is that it is not relevant for 'real life' exposures. That is another fallacy, based on the failure to understand that the elicitation of contact allergy under diagnostic patch test conditions is intended to show only one thing, whether an individual patient has contact allergy to a substance. The test fits the criteria for which it has been designed, to be sensitive and specific as a diagnostic tool. The characteristics of the multiple real life exposures that have led to the induction of contact allergy are rarely well defined, but what is self evident is that they

have occurred—those real life exposures have culminated in an adaptive immune response, therefore it is axiomatic that the substance involved is a skin sensitizer in humans. The relevance of a positive patch test for an individual patient is a matter for the dermatologist investigating the patient. The wider relevance of the collated data from diagnostic patch testing is that it informs those who produce and/or use the substance that it is a skin sensitizer, a potential cause of contact allergy and therefore of allergic contact dermatitis for which the risk

to human health must be rigorously assessed and properly managed.

One final thought: 'There are risks and costs to a programme of action. But they are far less than the long-term risks and costs of comfortable inaction.' (John F Kennedy).

David A. Basketter¹ and Ian R. White²

¹DABMEB Consultancy Ltd, Sharnbrook MK44 1PR, UK, and

²Department of Cutaneous Allergy, St. John's Institute of Dermatology, London SE1 7EH, UK

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