Editorial

The Evolving Field of Contact Dermatitis

Christen M. Mowad, MD

Patch testing has been performed since the 1800s and remains the gold standard for diagnosing allergic contact dermatitis. Although this diagnostic tool essentially has remained the same over the centuries, the allergens to which patients are exposed on a daily basis at home and at work through environment or personal care products continue to change and evolve. New preservative systems, fragrance chemicals, and innovations in the workplace result in new potential allergens and exposures; therefore, the allergens that can cause dermatitis evolve over time.

It has been established that early evaluation and diagnosis of allergic contact dermatitis decreases health care costs and improves quality of life; conversely, delayed diagnosis leads to poorer prognosis.[1,2] Studies also have shown that the standard screening series can be helpful in identifying allergens, but larger expanded testing can be more complete in order to identify all allergens that may be affecting a patient. Even larger screening series, however, can miss allergens, emphasizing the need for a thorough history of exposure, including the patient's hobbies, personal care products, and work environment to further and more specifically direct allergen testing.[3,4]

The usage of allergens and their observed allergenicity is in a state of flux. As allergic contact reactions to certain allergens are identified and reported to increase, the use of these allergens may take a corresponding drop as these components are recognized and replaced with new chemicals. Any new components can be potential allergens and may result in instances of allergic contact dermatitis over time; however, they can only be identified as allergens if they are included in the screening series. To stay abreast of the changing field of contact dermatitis to better serve their patients, physicians must be vigilant and adjust their screening series to reflect industry changes and identify new potential allergens.

Although many top allergens remain the same from year to year, new allergens continue to emerge. The top 10 allergens have remained the same over the last several years as reported by the North American Contact Dermatitis Group (NACDG), though some changes have been highlighted by shifts in their order.[3] The most recent data from the NACDG brings to light some of these trends, revealing a decrease in allergenicity in fragrance mix I and quaternium-15 and the emergence of relatively new allergens (eg, iodopropynyl butylcarbamate, fragrance mix II, propolis) in its list of the top 20 allergens. These new allergens are not in the standard screening series and may be missed if not included as supplemental allergens.

The more recent relative decrease in quaternium-15 positivity as reported by the NACDG is an example of the changes and evolution of allergens seen over time.[3] Preservatives are widely used in consumer personal care products and are a common cause of allergic contact dermatitis. The ideal preservatives system is nontoxic with a wide antimicrobial range, low irritancy, and low sensitization capacity. Quaternium-15 is a well-known preservative that has been used for decades; it also is well-established as a cause of contact allergy, and positive patch test rates have been high over the years.[3,5] The frequency of quaternium-15 use has decreased as indicated by the US Food and Drug Administration's Voluntary Cosmetic Registration Program.[6] Although not all formulations are registered (the program is voluntary), the database gives a good indication of usage patterns of preservatives over certain periods of time. For example, quaternium-15 was used in more than 1000 registered products in 1980 and was used in fewer than 400 in 2010, which may be partly due to the high incidence of contact allergy associated with this substance, showing how the industry has responded by changing usage in consumer products.[6]

The industry also introduces newer preservative systems to replace known allergens; however, as new chemicals are introduced, we must be aware that they are potential allergens and contact dermatitis may follow. Therefore, screening series must be adjusted to include these new allergens and also must evolve over time to be reflective of the changing environment. Iodopropynyl butylcarbamate is a preservative system introduced into personal care products over the last several decades. It was only available as an industrial fungicide in the 1970s and was not mentioned at all in the 1980 Voluntary Cosmetic Registration Program.

From the Department of Dermatology, Geisinger Medical Center, Danville, Pennsylvania.
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However, since it was approved for use in cosmetics, the number of products containing this preservative has increased.[6] Reports of contact allergies to this new preservative have emerged, and positive patch test results have increased over a short period of time.[3]

The fragrance industry is complex and also is evolving.[7] There are thousands of fragrance components in perfumes, personal care products, and cosmetics, and new ones are continually being developed. Fragrance mix I and *Myroxylon pereirae* used to be good screening allergens for fragrance, but studies suggest diagnosis based on these allergens alone is no longer sufficient for diagnosis of fragrance allergic contact dermatitis.[7-10] With the fluctuation in the fragrance industry and the development of novel fragrance components, new screening tools are needed to detect allergy to these newer fragrances. Fragrance mix II was introduced as a screening allergen to help increase detection of these newer fragrance components.[7-10] It has been shown to detect allergies not picked up by fragrance mix I or M *pereirae*. There is no doubt that as the fragrance industry continues to develop new scents, physicians will need to continually adjust their screening tools. Product labels make the situation more complicated. In the United States fragrances are listed generically on product labels simply as "fragrance." Specific ingredients are not listed on labels, as it is felt to be proprietary information. A change in labeling would help physicians and patients more readily identify these allergens.

Botanicals also highlight the fluidity of the contact dermatitis specialty. Just a few years ago, botanicals were barely mentioned in reference to personal care products, but today, many have some type of natural botanical component. Reading the label on almost any personal care product makes it apparent how widespread botanical exposure has become. Screening for botanicals remains difficult, as no one allergen alone is adequate for detection. Propolis is one of the emerging allergens identified.[3] A series of allergens as well as patch testing patient products often is needed to accurately identify the causative botanical.[11]

Groups such as the American Contact Dermatitis Society (ACDS), the NACDG, and similar international societies are composed of experts in contact dermatitis and often are the first to identify new and emerging allergens. Since 2000, the ACDS has named a contact allergen of the year to highlight those of new or emerging significance (Table). Many of these allergens are not on standard screening series and need to be tested beyond standard screening trays.

Allergic contact dermatitis is an evolving field and requires a sherlockian mentality. Inquisition regarding a patient's hobbies, exposures, occupation, personal care products, and botanical usage is needed to help direct specialized testing beyond standard trays. Standard series are a good starting point but may not completely evaluate a patient's allergens. Expanded series such as NACDG or ACDS core allergen series often are needed for full evaluation. Specialty trays based on the patient's history also may be needed, as even expanded trays do not always fully evaluate patients.[3] Furthermore, as personal care products continue to change, as the use of botanicals increases, and as new fragrances and preservative systems are introduced, allergen screening tools also will have to evolve to more completely and accurately diagnose and serve patients.

American Contact Dermatitis Society Allergens of the Year

Year	Allergen
2000	Disperse blue dyes
2001	Gold
2002	Thimerosal
2003	Bacitracin
2004	Cocamidopropyl betaine
2005	Corticosteroids
2006	Paraphenylenediamine
2007	Fragrance
2008	Nickel
2009	Mixed dialkyl thiourea
2010	Neomycin
2011	Dimethyl fumarate
2012	Acrylates
2013	Methylisothiazolinone

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