

Allergic Contact Dermatitis to Cosmetics

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KEYWORDS

- Cosmetic • Cosmetic allergy • Allergic contact dermatitis • ACD • Patch testing
- Cosmetic patch testing • Cosmetic series

KEY POINTS

- Cosmetics may cause allergic contact dermatitis (ACD) due to common allergenic components that are frequently found in cosmetics.
- The most common sites of reaction are the face and neck. The most common allergens in cosmetics are fragrances and preservatives.
- A thorough patient interview is the key to achieving proper diagnosis and management of cosmetic-induced ACD.
- Patch testing is the gold standard for diagnosing cosmetic-induced ACD, and the addition of a cosmetic series and testing of the patients' own products can be helpful.
- The mainstay of management is allergen avoidance.

INTRODUCTION

The history of cosmetic use is rich and antedates written history, spanning civilizations and centuries that began with the ancient Egyptians using their natural resources to create a myriad of products such as scented oils, creams, lip stains, and eyeliners. Today, cosmetics are used worldwide and create a steadily increasing multibillion-dollar industry. The term "cosmetic", according to the US Food and Drug Administration (FDA), means "(1) articles intended to be rubbed, poured, sprinkled, sprayed on, introduced into, or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and (2) articles intended for use as a component of any such articles; except that such term shall not include soap."¹ With a broad definition that encompasses facial makeup, skincare items, perfumes, hair and nail products, shaving gels or creams, and any

personal hygiene product such as toothpaste or deodorant, efforts have been put in place by the creation of the Cosmetic Ingredient Review in 1976 and the FDA to moderate the safety of cosmetic products. However, it is estimated that an adverse reaction to cosmetics occurs approximately once every 13.3 years per person.² It is difficult to estimate the frequency of adverse reaction because cosmetics in the general population, and the prevalence is most likely underestimated due to most people do not seek medical advice and simply discontinue use of the product suspected of triggering a reaction.³

There are many types of adverse reactions caused by cosmetics. Most adverse reactions are irritant; however, type IV hypersensitivity, contact urticaria, photosensitization, pigmentary disorders, damage of hair and nails, paronychia, acneiform eruptions, folliculitis, and exacerbation of an established dermatosis may also occur.⁴

Conflict of Interest: None.

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Allergic contact dermatitis (ACD), or a type IV hypersensitivity reaction, is much less common than an irritant dermatitis, and several studies have found the prevalence of ACD to be less than 1% in the general population.⁵⁻⁹ Type IV is a delayed-type hypersensitivity reaction that is T-cell mediated, wherein circulating or resident sensitized T cells are activated by the offending allergen to release pro-inflammatory cytokines. Sensitization depends on several factors including product composition, concentration of potential allergenic components, amount of product applied, application site, skin barrier integrity, and frequency and duration of application.^{10,11} Sensitization usually requires repeated exposure and application to damaged skin.

EPIDEMIOLOGY

Although the prevalence of cosmetic allergy is found to be less than 1% in various studies, it is most likely an inaccurate number due to the tendency of patients to forgo seeking medical attention and discontinue use of the product on their own. A study conducted in the United States of patients with suspected ACD by the North American Contact Dermatitis Group (NACDG) found that after patch testing 10,061 patients over 7 years, 23.8% of female patients and 17.8% of male patients had at least one allergic patch-test reaction associated with a cosmetic source.¹² One review found the pooled prevalence rate of ACD to cosmetics in 7 different studies to be 9.8%.¹³ The rate varies with time and geographic location, most influenced by the allergenicity of cosmetic ingredients, a population's increased use of cosmetics over time, and accessibility of allergens to be used in patch

testing.^{14,15} Studies reporting the epidemiology of cosmetic allergy characterize the population most affected with cosmetic sensitivity as female between 20 and 55 years of age.⁵⁻⁷

EVALUATION

Cosmetic allergy occurs through direct application of an allergen, or the allergen can be airborne or transferred (usually from the hands and fingernails). **Table 1** lists the different ways in which an allergen may come in contact with the skin.

ACD can be considered in the differential diagnosis according to the site of the reaction on the body and the allergen most likely to come in contact with that region. There are certain areas of presentation where ACD should be considered because of their frequency of cosmetic contact and the possible allergens that such cosmetics contain. These areas are the face, eyelid, neck, hands, scalp, and anogenital region.

Patient evaluation should begin with a thorough medical history and careful investigation of products used by the patient in all settings (house and work), followed by a physical examination. A finding of dermatitis on the following areas should make the clinician suspicious of a cosmetic contact allergy.

FACE

The face is the most common site of ACD, and cosmetics are a common cause of this condition.^{7,16} Because of the continually exposed nature of the face, cosmetic allergens come into contact with the face not only through direct application, but also indirectly through the air and through transfer from hands. A pattern of ACD on the face can appear patchy even when a product is applied to

Table 1
Modes of allergen transfer

Type	Definition	Example
Intentional direct contact	Allergenic ingredient in cosmetic product	Eye cosmetic, deodorant
Unintentional direct contact	Allergen-contaminated surface	Towel, pillow, telephone
Airborne	Gas, droplet, or particle in the atmosphere	Epoxy resin (occupation-related), cigarette smoke
Connubial	Contact with family, friends, colleagues	Perfume or hair dye from spouse
Ectopic	Transfer from one site of body to more sensitive area (ie, face, eyelids)	Fingernail varnish
Photosensitization	Photoallergens exposed to the sun	Photoallergens in sunscreen

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