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SKIN SENSITIZATION RISK ASSESSMENT

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ABSTRACT

As the most prevalent form of immunotoxicity in humans, skin sensitization leading to allergic contact dermatitis is also one of the most common occupational disorders in developed nations, affecting roughly 15–20% of the general population. Hundreds of chemicals, which are frequently found in home and environmental items including detergents, soaps, and cosmetics, have been linked to skin sensitization. In order to develop new therapeutic approaches and to identify biomarkers that enable the differentiation between sensitizers and irritants, it is imperative that we continue to expand our understanding of the physiopathological events caused by skin sensitizers and involved in the development of ACD and other skin inflammatory diseases. Although some molecules with a crucial role in the physiopathology of ACD have already been identified by a variety of genomic and proteomic techniques, lipidomic analysis has not yet been investigated for this purpose.

KEY WORDS: Contact dermatitis; Sensitization; Cosmetics; Skin; Risk Assessment.

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INTRODUCTION

Allergy contact dermatitis (ACD) is the clinical manifestation of allergic skin reactions, also known as skin sensitization [1]. In order to develop a process for new ingredients and products, one of the most important processes for testing skin safety and risk is skin sensitization testing and risk assessment [2]. It follows a step-by-step methodology that may include analytical assessments, such as preclinical skin sensitization testing, clinical testing, and benchmarking of the resulting data against similar ingredients and product types [3]. An important part of the skin sensitization risk assessment process is evaluating and understanding the relationship between skin sensitization hazards, such as the components' intrinsic propensity to produce allergic skin sensitization, and actual skin sensitization risk [4].

Chemical allergies were once frequently viewed as all-or-none reactions devoid of thresholds and dose-response relationships [5]. Because no allergy symptoms or indicators appear at the initial contact (often repeated exposures), even large amounts of sensitizer may go undetected. Despite the lack of clinical symptoms, this interaction may cause sensitization [6]. Ultimately, the symptoms of allergic contact dermatitis will undoubtedly result from varying concentrations (greater or lower) of the same sensitizer once sensitization has been established. This is the standard "working style" of the particular immune systems, which are essentially in place to combat microbial diseases [7]. According to recent research, the immune response is characterized by an asymptomatic "learning phase" (also known as the primary immune response or sensitization phase) and an effector phase (also known as the secondary

immunological response or elicitation phase) [8,9].

Between 1 to 5.4% of people are thought to be allergic to a cosmetic component [10]. Reactions are more common in women and account for about 80% of cases in individuals between the ages of 20 and 60 [11]. Allergy contact dermatitis can be brought on by common cosmetics including sunscreen, foundation, and lotions [12]. The idea of cosmetics has existed for as long as civilization and humanity, and people have always wanted to look beautiful. The desire to make one's body look beautiful has existed since the tribal era. As consumers, we are always drawn to beauty and personal care goods, but in addition to making us feel good and look good, these items can have a sinister side [13]. All of the harmful chemicals and poisonous substances used in these products are present in amounts that are unacceptable. These substances have the potential to penetrate the skin and other organs, producing carcinogenicity, and to have major negative effects on the skin [14]. It is estimated that 1–5.4% of the population is sensitized to a cosmetic ingredient. About 80% of reactions occur in patients aged 20–60 years and are seen more frequently in women [15]. The concept of cosmetic is as old as mankind and civilization and people want to look beautiful one way or the other. Since the tribal days, there has been this urge to beautify one's own body and look beautiful. As a consumer, we are continuously attracted to using beauty and personal care products, but along with having us feel healthy and look beautiful, these products have a deep dark side, too. All these toxic ingredients and hazardous chemicals used in these products are comprised in beyond

acceptable limits [16]. These chemicals may cause serious ill effects on skin and may also enter the skin and other organs causing carcinogenicity [17].

Substances used to improve the appearance of the human body are referred to as cosmetics. Cosmetics are often made up of chemical components, some of which come from natural sources and many of which are manmade [18]. Skin creams, lotions, lipsticks, nail polishes, and makeup for the face and eyes are examples of cosmetic items [19]. Fragrances and preservatives are the primary components of cosmetics. More than 5000 distinct types of fragrances are utilized in products, and they are the primary source of skin issues [20]. Additionally, preservatives are the second most frequent cause of skin issues [21].

In addition to sunscreens, various skin care and cosmetic items frequently result in adverse reactions and are the leading cause of hospitalization for allergic contact dermatitis [22]. One to three percent of people are thought to be allergic to a cosmetic or one of its ingredients. Seven hundred responses were recorded over a one-year period in a study of 30,000 consumers in the United States [23]. It is commonly known that sunscreen prevents sunburn. Nonetheless, some data suggests that wearing sunscreen may have detrimental effects on one's health because sunscreens contain dubious substances that can have negative consequences on the skin and body, including hormone disruption, allergic reactions, premature aging, and an increased risk of cancer [24]. Along with their increased media exposure and the growing number of goods being created and offered for sale, cosmetics are used by the general public in an unending number

of ways these days [25]. During each five-year period, the top three allergens, aside from three metals, were cosmetic ingredients: two fragrances (fragrance mixed I, linalool hydro peroxide) and two preservatives (paraben mix, methylisothiazolinone) [26].

CONCLUSION

The growing incidence of allergic contact dermatitis from cosmetic products is a public health issue of great concern since most of the consumers are not aware of the dangerous chemicals used in cosmetics. Even with all the regulations, most of the cosmetics contain skin allergens and irritants that cause severe skin conditions, involving a large proportion of the population, particularly females.

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