The Interplay of Environmental and Genetic Factors in the Prevalence of Atopic Dermatitis

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Atopic dermatitis, also known as atopic eczema, is prevalent in both children and adults. Developing in infancy and progressing through adulthood, this skin disease affects at least 20% of children and 5% of adults. Indeed, recent findings have shown that the prevalence of child-onset atopic dermatitis continues to increase in the United States, and the U.S. currently has the highest number of adult-onset atopic dermatitis worldwide. While the physical symptoms of atopic dermatitis vary from person to person, atopic dermatitis has been shown to negatively impact one's quality of life, sleep quality, and overall self-esteem. This review explored the genetic, environmental, and immune system dysregulation factors associated with atopic dermatitis and analyzed how their relationship might guide the development of treatments and therapies for atopic dermatitis. First, this review provides an in-depth background of atopic dermatitis, the dysfunction of the skin barrier and dysregulation of the immune system, and the variety of exposome factors that trigger a response of atopic dermatitis. Next, this review describes the complex interactions between genetics and the environment in the progression of atopic dermatitis. Studies demonstrated that exposome (environment exposures) factors like air pollution, aeroallergens, and UV exposure negatively impact genes specifically in keratinocytes and immune effector cells that are affiliated with the skin barrier and immune system. Future research is required to further identify additional environmental factors and their influence on genetics in atopic dermatitis. Understanding of genetic factors affecting sensitivity to environmental risk factors in atopic dermatitis will be beneficial in providing treatment and therapeutic relief that will further promote better quality of life.