Relationship of Risk Factors on Children with Atopic Dermatitis

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Abstract

Background: Atopic dermatitis (AD) is a persistent and recurring inflammatory skin condition, marked by acute eczema or chronic lichenified lesions, with a diverse range of presentations. This skin disease affects almost 10-20% of people worldwide. The progression of atopic dermatitis is characterized by chronic relapses, which can greatly impact patients' quality of life. Biomarkers have long played an essential role in various medical applications, particularly for diagnostic purposes. However, identifying appropriate biomarkers for atopic dermatitis remains challenging, primarily due to difficulties in obtaining samples. **Objective:** To find out the antiderm mobile-based application, discussing the knowledge of atopic dermatitis. **Method:** Literature review is taken from databases such as PubMed and Google Scholar published in the last 5 years, namely from 2018-2022. Then find out about the ANTIDERM mobile-based application. **Results:** Based on the literature, there are several biomarkers that can be used for patients with atopic dermatitis including TARC or CCL17, CCL27, phytosphingosine CD300a, Interleukin-1 family (IL-18, IL1?, CXCL8), adipokines, FABP5, filaggrin. In addition, the mobileantiderm-based application facilitates communication between doctors and patients, and contains some information about the symptoms of dermatitis so that the public can know the symptoms of dermatitis and how to avoid this dangerous disease. **Conclusion**: From this literature, it was found that there are several current methods for patients with atopic dermatitis that can be used to help the community in preventing atopic dermatitis.

Keywords: Biomarker Atopic Dermatitis, Atopic Dermatitis Diagnosis, Mobile Health Applications Atopic Dermatitis

Introduction

Atopic dermatitis (AD) is a chronic, recurrent skin condition marked by inflammation and severe itching. It predominantly affects specific body regions, such as the face in infants and the folds of extremities during childhood. While AD often emerges in early childhood, approximately half of the cases resolve by adolescence. However, the condition can persist or even manifest for the first time in adulthood. The term "atopy" was introduced by Coca and Cooke in 1923, derived from the Greek word "atopos," meaning "out of place," reflecting the condition's unusual skin manifestations and disease progression. The prevalence of AD has been increasing globally, strongly linked to a history of atopy.[1]

The etiology of AD involves both intrinsic and extrinsic factors, though its exact cause remains elusive. Clinically, AD is defined by itching and characteristic skin abnormalities. Epidemiological studies indicate varying prevalence rates, with Swedish children showing the highest prevalence (34%) and Tunisian children the lowest (0.65%).[2] The condition’s severity and morbidity depend on factors such as age, gender, socioeconomic status, geographic location, and ethnicity. Risk factors include skin barrier dysfunction caused by FLG mutations, environmental changes, and dietary habits.[3]

In epidemiological studies, the UK Working Party diagnostic criteria are widely used for AD diagnosis due to their practicality. Hospital-based studies often employ the Hanifin-Rajka criteria.[2] AD significantly affects quality of life, leading to psychological stress for patients and their families. Effective management of AD requires a comprehensive approach addressing genetic predisposition, skin barrier integrity, environmental triggers, and patient education.[4]

Methods

Literature review is taken from databases such as PubMed and Google Scholar published in the last 5 years, namely from 2018-2022

Result

Table 1. Summary of Article Results

Author and Year	Title	Research methods	Research result
R Chovatiya et al. J DrugsDermatol. 2022	Heterogeneity of Atopic Dermatitis	A focused review of existing literature, encompassing retrospective, observational, and prospective studies, clinical trials, and consensus guidelines, is essential. Additionally, the Antiderm mobile application can serve as a valuable tool in this process.	Atopic dermatitis (AD) is linked to a variety of skin manifestations, symptoms, severity, lesion extent, progression, and associated comorbidities. Each of these factors represents a unique aspect of the condition and should be considered when assessing severity and managing treatment. Focusing solely on one clinical aspect of AD is inadequate for fully understanding the overall impact of the disease.
Andreas Wollenberg et al. DtschArztebl Int. 2023	Atopic Dermatitis in Children and Adults - Diagnosis and Treatment	This review is based on relevant publications retrieved through a selective search in PubMed, including current German and European guidelines. In addition, the mobile antiderm method can be used.	Basic therapy with drug-free topical agents significantly improves the skin barrier function. Adults should apply at least 250 g per week. Patient-specific triggers such as allergens, stress, pathogenic microbes, or skin irritations should be eliminated or avoided. For mild and moderate cases of atopic dermatitis (AD), treatment with topical

Author and Year	Title	Research methods	Research result
			glucocorticoids and calcineurin inhibitors is typically adequate. Proactive therapy is recommended for patients who experience frequent flare-ups or have a long-standing condition. In more severe cases, systemic anti-inflammatory treatments, including biologics such as dupilumab and tralokinumab, Janus kinase inhibitors like baricitinib, upadacitinib, and abrocitinib, or traditional immunosuppressive medications, are often necessary. The patient should be actively involved in the selection and planning of treatment; the patient's age and skin findings should be taken into account. Interdisciplinary patient education yields lasting benefits.

Author and Year	Title	Research methods	Research result
Dana V Wallace. Allergy Asthma Proc. 2022	Treatment options for moderate to severe atopic dermatitis	To prepare this narrative review, a literature search was conducted across multiple medical databases, focusing on guidelines, position papers, systematic reviews, and clinical trials related to the treatment of moderate to severe atopic dermatitis (AD) published between 2012 and 2022. Additionally, the Antiderm mobile application may also be utilized as a resource.	Topical emollients and corticosteroids are the primary treatments for managing acute flare-ups and maintaining long-term control of atopic dermatitis. Second-line topical treatments include calcineurin inhibitors like tacrolimus and pimecrolimus, as well as krisoboro and ruxolitinib. In cases of acute flare-ups, cyclosporine is favored over systemic corticosteroids for better management. For long-term management, phototherapy should be considered prior to initiating systemic anti-inflammatory treatments. Among traditional anti-inflammatory drugs, cyclosporine is the first-line option, with methotrexate and azathioprine being considered as second-line treatments. While abrocitinib may show

Author and Year	Title	Research methods	Research result
			superior efficacy compared to dupilumab in indirect comparisons, it necessitates more careful monitoring for potential side effects. According to the product guidelines, Janus kinase inhibitors (JAK inhibitors) like abrocitinib and upadacitinib should only be used after other systemic therapies, including biologics (such as dupilumab and tralokinumab), have proven ineffective. Biologics and JAK inhibitors should be considered before resorting to traditional systemic anti-inflammatory agents.
J. RentGeopal, Erin Elvira, Claudia Claudia, Ilma Tria Nursyifa,	Biomarker Examination in Patients with Atopic Dermatitis: A Review	Literature review is taken from databases such as PubMed and Google Scholar published in the last 5 years, namely from 2018-2022. Then find out about the	Based on the literature, there are several biomarkers that can be used for patients with atopic dermatitis, including TARC or CCL17, CCL27, phytosphingosine

Author and Year	Title	Research methods	Research result
Celine Celine, 2023		ANTIDERM mobile-based application.	CD300a, Interleukin-1 family (IL-18, IL1?, CXCL8), adipokines, FABP5, filaggrin. In addition, the mobileantiderm-based application facilitates communication between doctors and patients, and contains some information about the symptoms of dermatitis so that the public can know the symptoms of dermatitis and how to avoid this dangerous disease.
Shruti Ghosalkar et al. J CosmetDermatol. 2022 Feb	The development of topical drug delivery methods for managing atopic dermatitis	This article examines and explores the available literature on topical drug delivery methods for treating atopic dermatitis. Additionally, the mobileantiderm application can also be utilized for this purpose	The reviewed literature emphasizes the advantages of new topical formulations that offer targeted drug delivery, enhanced penetration, improved therapeutic effectiveness, and reduced systemic side effects.

Discussion

Definition Atopic dermatitis is characterized by interconnected inflammatory processes, primarily presenting as itching and elevated IgE levels. It is commonly linked to a family history of atopy. Psychological factors, such as stress, can exacerbate the condition.[6]

Etiology AD arises from endogenous factors, such as genetic predisposition and skin barrier defects, and exogenous factors, including exposure to allergens like dust mites and irritants.[3]

Diagnostic Criteria AD can be categorized into three stages:[2]

1. **Infantile phase (3 months-2 years):** Acute lesions, often on the cheeks, forehead, and extremities, with erythematous papules and severe itching.
2. **Childhood phase (3-12 years):** Subacute lesions on the neck and elbow folds, characterized by erosion and excoriation.
3. **Adult phase (12 years and above):** Chronic lesions with hyperpigmentation, lichenification, and severe itching, often affecting the extensor areas and fold regions (Langan et al., 2020).

Diagnostic tools include the UK Working Party criteria and the Hanifin-Rajka criteria, requiring the presence of major and minor criteria. Factors such as malnutrition and incomplete immunization increase AD risk, while adequate nutrition and immunization confer protective effects.[1]

Differential Diagnosis Conditions to differentiate from AD include seborrheic dermatitis, contact dermatitis, psoriasis, and scabies. For instance, seborrheic dermatitis affects areas with sebaceous glands and presents as oily scales, while allergic contact dermatitis involves delayed hypersensitivity reactions.[7]

Management AD management involves:[2]

1. Education for patients and caregivers.
2. Avoidance of environmental triggers.
3. Maintenance of skin barrier function using moisturizers.
4. Anti-inflammatory treatments such as corticosteroids.
5. Control of the itch-scratch cycle with antihistamines and counseling

Latest Findings

1. Connection Between the Onset of Atopic Dermatitis (AD) and Allergic Rhinitis: A recent study discovered that children with early-onset atopic dermatitis are at a higher risk of developing sensitization to aeroallergens and allergic rhinitis as they grow older, compared to those with later-onset AD. The research also noted that the severity of AD during early childhood was associated with an increased likelihood of developing allergic rhinitis in the future.[8]
2. Genetic and Environmental Factors: Children with a family history of atopy, along with exposure to allergens such as dust mites, air pollution, and pet dander, are at a higher risk of developing both atopic dermatitis (AD) and allergic rhinitis. A compromised

skin barrier in AD patients, particularly due to mutations in the filaggrin gene, contributes significantly to the increased likelihood of developing allergic rhinitis.[8]

3. Epidemiological Studies: Multiple studies have demonstrated that more severe atopic dermatitis increases the risk of developing respiratory allergies, including allergic rhinitis and asthma. In a study conducted in Denmark, approximately 35% of children with early-onset atopic dermatitis were sensitized to aeroallergens by the age of 6, with this percentage rising by the time they reached 12 years old.[8]

The relationship between childhood atopic dermatitis (AD) and allergic rhinitis has been a topic of much research, especially in the last 5 years. Recent research indicates that atopic dermatitis and allergic rhinitis frequently occur together as part of the "atopic march," a sequence where atopic dermatitis progresses to asthma and eventually to allergic rhinitis.[8]

Conclusion

Atopic dermatitis is a multifactorial, chronic condition requiring tailored management. Nutritional status and immunization significantly impact AD risk. Improved access to immunization and adequate nutrition can reduce AD prevalence and severity.
Enhanced education and research remain crucial for addressing this complex condition.

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