**Literature review: Integrative Approaches to Treatment of Eczema**

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January 2, 2024

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**Introduction**

Atopic dermatitis (AD) is a chronic inflammatory skin condition that affects millions globally. According to Chovatiya (2023), AD impacts approximately 200 million individuals worldwide, including up to 20% of children and around 10% of adults. Although AD predominantly manifests in early childhood and often persists into adulthood, emerging evidence indicates that adult-onset AD is not uncommon. Chovatiya (2023) reports that approximately 25% of adults with AD experience adult-onset disease, underscoring its potential to emerge beyond childhood. For example, a case study involving a 36-year-old female highlights this phenomenon, as she developed AD only 10 months prior to her presentation.

Atopic dermatitis (AD) imposes significant economic and societal burdens, primarily due to high treatment costs and its profound impact on quality of life and morbidity. Kapur (2018) estimates that the annual cost of managing AD in Canada is approximately $1.4 billion. In the United States, Wang et al. (2022) reported an annual per-patient cost of $10,474 for adults diagnosed with AD between 2016 and 2018. Despite these estimates, accurately quantifying the economic burden of AD remains challenging due to its varying severity and the interplay of direct and indirect costs, as highlighted by Wang et al. (2022).

This review explores the causes and clinical manifestations of AD, supported by a thorough examination of existing literature and the provided case study. Additionally, evidence-based treatment strategies are categorized into traditional and non-traditional approaches, offering a comprehensive understanding of current therapeutic options. By examining these dimensions, this discussion aims to advance the understanding of AD and its management in clinical practice.

**Protocol**

This review aims to address the central question: *What factors contribute to the onset of atopic dermatitis (AD), and what are the key symptoms, treatment strategies, and preventive measures available?* To comprehensively explore this topic, literature will be sourced from established databases, including PubMed, ScienceDirect, Scopus, and Web of Science. The keyword search strategy will incorporate terms such as “Atopic Dermatitis,” “Eczema,” “Pathophysiology of Atopic Dermatitis,” “Symptoms of Atopic Dermatitis,” and “Treatment Interventions for Atopic Dermatitis.”

Inclusion criteria for this review are limited to peer-reviewed articles published in English within the past five years that provide a detailed examination of AD. Exclusion criteria include articles published more than six years ago, non-peer-reviewed or non-scholarly works, and publications not available in English or lacking an English translation.

The selected literature and case studies will be analyzed to draw insights on the key themes of this review, including the pathophysiology, triggers, clinical manifestations, treatment modalities, and preventive strategies for AD. By synthesizing findings from diverse sources, this review seeks to provide a comprehensive and evidence-based perspective on the current understanding and management of AD.

**Literature Review**

**Causes / Pathophysiology of Atopic Dermatitis**

Atopic dermatitis (AD) is a multifactorial chronic skin condition arising from the interplay between an impaired skin barrier and environmental irritants. Kapur et al. (2018) and Kolb & Ferrer-Bruker (2020) identify the compromised skin barrier as a key factor, allowing allergens and irritants to penetrate and trigger allergic sensitization and inflammation. Common household products, such as shampoos, soaps, laundry detergents, and body washes, are among the primary environmental irritants that exacerbate skin inflammation. This inflammation commonly manifests as creases in areas where skin rubs together, such as behind the knees and elbows.

Kolb & Ferrer-Bruker (2020) further highlight the role of decreased ceramide levels in AD. Ceramides are critical for maintaining skin barrier integrity and preventing transepidermal water loss. Their deficiency compromises the skin’s ability to retain moisture and protect against external factors. Similarly, the Mayo Clinic (2023) emphasizes that weakened barrier functions reduce the skin's capacity to defend against bacteria, irritants, and other environmental agents, thereby increasing the risk of AD. Nemeth & Evans (2020) also note that a dysfunctional skin barrier elevates susceptibility to skin infections, compounding the challenges of managing AD.

Genetic predisposition represents another significant determinant of AD. Martin et al. (2020) report that individuals with a family history of AD face a substantially higher risk of developing the condition. This is exemplified in the case study patient, whose mother experienced AD during childhood, underscoring the hereditary nature of the disease. Brown et al. (2020) reinforce this observation, noting that children with one parent affected by AD have a 1.5-fold increased risk of developing the condition. Twin studies provide further evidence of the genetic basis of AD, with monozygotic twins demonstrating concordance rates of 72–86%, compared to 21–23% in dizygotic twins. These findings indicate heritability estimates for AD ranging from 70% to 80% (Brown et al., 2020).

The familial clustering of AD is influenced by shared genetic and environmental factors. This robust genetic component underscores the importance of understanding hereditary contributions to the pathogenesis of AD and tailoring interventions to address both genetic and environmental triggers.

**Symptoms of Atopic Dermatitis**

Atopic dermatitis (AD), commonly known as eczema, can affect various parts of the body and manifests through a range of symptoms. In the context of the provided case study, one notable symptom is persistent, itchy skin rashes, which typically appear in areas such as the inside of the elbows, the back of the neck, and the knees. Nemeth and Evans (2020) explain that the distribution of skin rashes varies by patient age. Infants are particularly prone to developing widespread dry, erythematous patches often accompanied by small excoriations. As children age, these rashes tend to become more localized, primarily affecting extensor surfaces such as the knees, ankles, and elbows.

Another distinguishing feature of AD is the presence of Dennie-Morgan lines—crease-like wrinkles beneath the lower eyelids. Narla and Silverberg (2021) report that this symptom is most frequently observed in India, followed by Europe and Africa, with lower prevalence in the Americas and Iran. Despite regional variations in recognition, Dennie-Morgan lines remain a significant diagnostic marker for identifying individuals with eczema.

Additional symptoms include oozing and crusting, skin thickening, and raised bumps, which may present differently on darker skin tones. According to the Mayo Clinic (2023), crusting often results from repeated scratching, causing lesions to exude fluid and eventually form crusts. The American Academy of Dermatology Association (AADA, 2023) adds that adults with AD are more likely than children to experience symptoms on their hands and around the eyes. Affected areas on the hands often exhibit thickened, hyperpigmented skin compared to surrounding tissue.

Beyond cutaneous manifestations, AD is strongly associated with other chronic conditions, including asthma and food allergies. Yaneva and Darlenski (2021) highlight that AD often serves as the initial phase in the progression of atopic disorders, a phenomenon known as the "atopic march." However, these comorbidities can also arise following the onset of asthma or allergic rhinitis. According to their study, the prevalence of asthma among individuals with AD is approximately 27.5%, a correlation attributed to shared genetic predispositions underlying both conditions. This diverse symptomatology underscores the need for a tailored approach to diagnosis and management, considering variations in clinical presentation across age, ethnicity, and comorbid conditions.

**The conventional approach to atopic dermatitis treatment**

Atopic dermatitis is a multifaceted condition, necessitating equally sophisticated and comprehensive treatment approaches. However, it is important to acknowledge that no definitive cure currently exists for atopic dermatitis. Presently, the treatment and management of this condition can be accomplished by leveraging either conventional/ traditional interventions, non-traditional interventions or the integration of the two treatment modalities. This section of the review provides insights into the conventional and non-conventional treatment options of atopic dermatitis, while providing insights into how the se to can be integrated to treat and manage this condition.

**Conventional Treatment**

As noted earlier, the treatment and management of atopic dermatitis can be achieved through conventional means.Calabrese et al. (2022) describe the conventional management of atopic dermatitis as a multi-targeted approach designed to restore and enhance the skin’s barrier function while simultaneously reducing inflammation and alleviating itching.Conventional treatment for atopic dermatitis primarily aims to mitigate bacterial colonization and address factors that trigger flare-ups (Calabrese et al., 2022). Furthermore, the key objectives of conventional management include alleviating and managing dry skin, preventing infections, and promoting the healing process (Bieber, 2021).

Conventional therapy for Atopic Dermatitis, which is usually considered as the first line of treatment can either be topical and systemic. According to Calabrese et al. (2022), some of the topical agents leveraged in the conventional treatment and management of this condition include corticosteroids, calcineurin inhibitors, moisturizers, antimicrobials/antiseptics, and calcineurin inhibitors. Additionally, conventional topical treatments include wet wrap therapy. It is worth noting that the topical treatments mentioned above are mostly leveraged in mild to moderate Atopic Dermatitis. According to Calabrese et al. (2022), severe forms of this condition often require the implementation of systemic interventions including phototherapy, systemic corticosteroids, cyclosporine, methotrexate, mycophenolate mofetil and azathioprine.

As previously mentioned, moisturizers are categorized as a topical therapy within the conventional treatment framework for atopic dermatitis. Elias (2022) emphasizes that the effectiveness of moisturizers in managing atopic dermatitis is largely attributed to their ability to address xerosis and restore skin hydration. Calabrese et al. (2022) note that xerosis has been identified to render the epidermal barrier dysfunctional and facilitate trans epidermal water loss. With that in mind, xerosis comes out as a critical clinical feature associated with this condition. Notably, moisturizers work by reducing the severity of this condition and patients are advised to apply moisturizers at least once a day. According to Elias (2022), moisturizers typically contain several ingredients including humectant, occlusive, and emollients. The humectant components in moisturizers, such as urea, glycerol, and lactic acid, play a pivotal role in mitigating dry skin by enhancing the skin's ability to attract and retain moisture. Conversely, the occlusive components in moisturizers, including mineral oil, petroleum, and dimethicone, function by forming a protective layer over the skin, thereby significantly reducing transepidermal water loss. Additionally, emollients, such as glyceryl stearate, soy sterols, and glycol, are integral to moisturizers, contributing to skin softening and lubrication by filling in spaces between skin cells and enhancing smoothness.

As noted earlier, the other conventional therapy for Atopic Dermatitis besides moisturizers concerns topical corticosteroids. According to Chalmers et al. (2019), topical corticosteroids have been noted to be effective in reducing inflammation through the suppression of pro-inflammatory cytokines and impeding antigen processing. The efficacy of topical corticosteroids in the management and treatment of Atopic Dermatitis has also been associated with the propensity to act immune cells such as the macrophages, dendritic cells, T lymphocytes, and monocytes (Chalmers et al., 2019).

Another conventional treatment modality for atopic dermatitis is wet wrap therapy (wwt) According to Calabrese et al. (2022), wet wrap therapy is treatment modality leveraged when cases involve severe flare-ups and recalcitrant. As the name suggests, this intervention usually entails the application of moisturizers, topical corticosteroids, or the combination of these two followed by the use of a gauze, cotton suit, or tubular bandages to cover the first layer (wetted) which is then followed by a dry layer. According to He et al. (2019), this therapeutic modality has been associated with enhanced penetration of the topical agents used and significant negation in skin water loss. Although this treatment modality is effective, it is not without limitations, with key challenges including reduced practicality and poor tolerance, particularly among pediatric patients.

Another conventional treatment leveraged in the management of Atopic Dermatitis concern topical calcineurin inhibitors. According to Papier and Strowd (2018), this treatment usually works through the inhibition and blockage of calcineurin-dependent T-cell activation and pro-inflammatory cytokines. With that in mind, topical calcineurin inhibitors are usually recommended for acute and chronic treatment of Atopic Dermatitis.

Systemic therapies are an important consideration in the treatment and management of eczema, particularly in more severe or refractory cases. Calabrese et al. (2022) highlight phototherapy as a systemic treatment modality for atopic dermatitis, often utilized as a second-line intervention when first-line treatments such as moisturizers, topical corticosteroids, and topical calcineurin inhibitors (TCIs) prove ineffective. This approach employs light therapy to mitigate the signs and symptoms of the condition by modulating immune responses and reducing inflammation.

Another systemic therapeutic option is the use of systemic corticosteroids. However, Calabrese et al. (2022) caution that this treatment should be considered a last resort due to its significant adverse effects. Systemic corticosteroids are typically reserved for acute and severe cases and are recommended as a short-term solution to bridge the transition to other systemic therapies.

Additionally, cyclosporine, an immunosuppressant, has been identified as an effective treatment for severe atopic dermatitis. According to Elias (2022), cyclosporine works by suppressing the production of interleukin-2 and T-cells, thereby dampening the immune response associated with the condition. This modality is particularly beneficial for patients with severe, treatment-resistant eczema, underscoring the importance of tailored therapeutic strategies in managing this complex disease.

**Alternative modes of treatment**

Besides the convention methods, several alternative treatments of eczema have been studied and applied with significant efficacy noted. According to Jwo et al. (2022), acupuncture is one of the non-conventional treat modalities for eczema. Notably, acupuncture has been noted to be effective in alleviating the itching associated with this condition especially when applied to the large intestines. Besides acupuncture, research has also indicated that stress management techniques are also effective in the treatment and management of eczema. According to Oska and Nakamura (2022), stress has been associated with triggering eczema due to the hormonal spikes associated with stressful situations. Stress has also been noted to result in the weakening the skin’s barrier function, thereby enhancing the susceptibility of healthy individuals to have atopic dermatitis. Utilization of techniques such as massage and hypnosis can serve as an effective approach to the treatment and management of eczema. Other than these techniques, Rusu et al. (2019) suggest that the use of prebiotics and probiotics can serve as other vital non-conventional approaches to treating this condition. Probiotics, a type of functional food supplement, introduce beneficial microorganisms commonly referred to as "good bacteria" into the gut. Prebiotics, on the other hand, serve as substrates that stimulate the growth and activity of these beneficial bacteria in both the gut and on the skin. Together, they contribute to enhancing the integrity and functionality of the intestinal barrier, promoting overall gut health and immune resilience. Consequently, they play a crucial role in reducing allergic responses and alleviating the severity of atopic dermatitis (AD).

**Integration of Conventional and Non-Conventional**

Calabrese et al. (2022) note that both conventional and non-conventional approaches play a critical role in the management of atopic dermatitis (AD). It is essential to recognize that conventional medical treatments do not guarantee complete relief from the symptoms of atopic dermatitis (AD). While these therapies can be effective for many patients, they may fall short in achieving full symptom control, especially in severe or refractory cases. Additionally, some conventional treatments, such as corticosteroids, can lead to adverse effects or provoke negative reactions in certain individuals, potentially worsening their condition rather than alleviating it. This underscores the limitations of conventional approaches and highlights the need for alternative strategies in managing AD.

To address these challenges, healthcare providers must consider incorporating complementary interventions into treatment plans. Such integrative approaches can enhance the safety, effectiveness, and overall quality of care provided to individuals with AD (Calabrese et al., 2022). Complementary therapies, when used alongside conventional treatments, can help address the multifaceted nature of AD, targeting not only the physical symptoms but also improving overall patient well-being and satisfaction with care.

Equally important is the active involvement of patients in the decision-making process regarding their treatment and care plans. Engaging patients in discussions about their preferences and concerns ensures that the chosen interventions align with their comfort levels and personal values. This collaborative approach fosters better adherence to treatment regimens and optimizes therapeutic outcomes by tailoring care to meet individual needs. By combining complementary interventions with patient-centered care, healthcare providers can deliver more holistic and effective solutions for managing atopic dermatitis.

**References**

American Academy of Dermatology Association. (2023). Eczema types: Atopic dermatitis symptoms. Www.aad.org. <https://www.aad.org/public/diseases/eczema/types/atopic-dermatitis/symptoms>

Bieber, T. (2022). Atopic dermatitis: an expanding therapeutic pipeline for a complex disease. *Nature reviews Drug discovery*, *21*(1), 21-40.

Brown, S. J., Elias, M. S., & Bradley, M. (2020). Genetics in Atopic Dermatitis: Historical Perspective and Future Prospects. Acta dermato-venereologica, 100(12), adv00163. <https://doi.org/10.2340/00015555-3513>

Calabrese, G., Licata, G., Gambardella, A., De Rosa, A., Alfano, R., & Argenziano, G. (2022). Topical and Conventional Systemic Treatments in Atopic Dermatitis: Have They Gone Out of Fashion?. *Dermatology practical & conceptual*, *12*(1), e2022155. https://doi.org/10.5826/dpc.1201a155

Chalmers, J. R., Axon, E., Harvey, J., Santer, M., Ridd, M. J.,… & Thomas, K. S. (2019). Different strategies for using topical corticosteroids in people with eczema. *The Cochrane Database of Systematic Reviews*, *2019*(6), CD013356. <https://doi.org/10.1002/14651858.CD013356>

Chovatiya, R. (2023). Atopic Dermatitis (Eczema). JAMA, 329(3), 268. <https://doi.org/10.1001/jama.2022.21457>

Elias P. M. (2022). Optimizing emollient therapy for skin barrier repair in atopic dermatitis. *Annals of allergy, asthma & immunology : official publication of the American College of Allergy, Asthma, & Immunology*, *128*(5), 505–511. <https://doi.org/10.1016/j.anai.2022.01.012>

He, H., Koh, M. J., Lee, H. Y., & Ang, S. B. (2020). Pilot study of a customized nanotextile wet garment treatment on moderate and severe atopic dermatitis: A randomized clinical trial. *Pediatric dermatology*, *37*(1), 52–57. <https://doi.org/10.1111/pde.13981>

Jwo, J. Y., Chiou, K., Tsai, J., Huang, Y. C., & Lin, C. Y. (2022). Efficacy of Acupuncture for Treatment of Atopic Eczema and Chronic Eczema: A Systematic Review and Meta-analysis. *Acta dermato-venereologica*, *102*, adv00791. https://doi.org/10.2340/actadv.v102.4380

Kapur, S., Watson, W., & Carr, S. (2018). Atopic dermatitis. Allergy, asthma, and clinical immunology: official journal of the Canadian Society of Allergy and Clinical Immunology, 14(Suppl 2), 52. <https://doi.org/10.1186/s13223-018-0281-6>

Kolb, L., & Ferrer-Bruker, S. J. (2020). Atopic Dermatitis. PubMed; StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK448071/>

Martin, M. J., Estravís, M., García-Sánchez, A., Dávila, I., Isidoro-García, M., & Sanz, C. (2020). Genetics and Epigenetics of Atopic Dermatitis: An Updated Systematic Review. Genes, 11(4), 442. <https://doi.org/10.3390/genes11040442>

Mayo Clinic. (2023, May 9). Atopic dermatitis (eczema) - Symptoms and causes. Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/atopic-dermatitis-eczema/symptoms-causes/syc-20353273>

Narla, S., & Silverberg, J. I. (2021). Dermatology for the internist: optimal diagnosis and management of atopic dermatitis. Annals of Medicine, 53(1), 2165–2177. <https://doi.org/10.1080/07853890.2021.2004322>

Nemeth, V., & Evans, J. (2020). Eczema. PubMed; StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK538209/>

Oska, C., & Nakamura, M. (2022). Alternative Psychotherapeutic Approaches to the Treatment of Eczema. *Clinical, cosmetic and investigational dermatology*, *15*, 2721–2735. https://doi.org/10.2147/CCID.S393290

Papier, A., & Strowd, L. C. (2018). Atopic dermatitis: a review of topical nonsteroid therapy. *Drugs in context*, *7*, 212521. https://doi.org/10.7573/dic.212521

Rusu, E., Enache, G., Cursaru, R., Alexescu, A., Radu, R., Onila, O., Cavallioti, T., Rusu, F., Posea, M., Jinga, M., & Radulian, G. (2019). Prebiotics and probiotics in atopic dermatitis. *Experimental and therapeutic medicine*, *18*(2), 926–931. https://doi.org/10.3892/etm.2019.7678

Wang, X., Boytsov, N. N., Gorritz, M., Malatestinic, W. N., Goldblum, O. M., & Wade, R. L. (2022). US health care utilization and costs in adult patients with atopic dermatitis by disease severity. Journal of managed care & specialty pharmacy, 28(1), 69–77. <https://doi.org/10.18553/jmcp.2022.28.1.69>

Yaneva, M., & Darlenski, R. (2021). The link between atopic dermatitis and asthma- immunological imbalance and beyond. Asthma research and practice, 7(1), 16. <https://doi.org/10.1186/s40733-021-00082-0>