

A Review: Role Of Herbal Medicine in Treatment of Eczema

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Abstract: Millions of people worldwide suffer from eczema, a chronic inflammatory skin condition that severely impairs quality of life and is typified by erythema, pruritus, and malfunctioning of the epidermal barrier. Despite their effectiveness, conventional therapies such as immunosuppressants and corticosteroids frequently have long-term adverse effects and restrictions. As a result, herbal therapy is becoming more and more popular as an alternative or complementary treatment for eczema. Bioactive substances with anti-inflammatory, antioxidant, antibacterial, and immunomodulatory qualities are abundant in herbal remedies. Aloe vera, Curcuma longa, Glycyrrhiza glabra, Azadirachta indica, and Chamomilla recutita are among the plants that have been used traditionally and scientifically for their potential to reduce the symptoms of eczema. This review examines the pathophysiology of eczema, the mechanisms of action of herbal agents, the clinical and experimental evidence for their effectiveness, and the advantages over conventional therapy. It also discusses the current issues, the future scope, and suggestions for the incorporation of herbal medicine into dermatological care. When standardized and validated through rigorous research, herbal approaches may offer a safe, effective, and sustainable alternative or adjunctive therapy for the treatment of eczema.

Keywords: Eczema, Herbal medicine, Anti-inflammatory herbs, Skin inflammation, Atopic dermatitis

I. Introduction:

Eczema, also known as atopic dermatitis, is a chronic inflammatory skin illness that affects people of all ages and socioeconomic backgrounds. Eczema is a physically and emotionally upsetting condition that is characterized by symptoms like redness, itching, dryness, and sporadic seeping or crusting. The World Health Organization reports that eczema affects 1-3% of adults and 15- 20% of children worldwide, with a rising incidence in affluent nations. Because of its chronic nature and propensity for recurrence, it is one of the most prevalent dermatological disorders seen in clinical

practice and places a heavy strain on healthcare systems¹⁻².

The pathophysiology of eczema is multifaceted, with microbial, immunological, environmental, and genetic factors all being important. Because eczema patients have a weakened skin barrier, their skin is more vulnerable to allergens and microbial infections, which can lead to immunological reactions that worsen inflammation³⁻⁴. The treatment of eczema has advanced significantly in modern medicine. The cornerstones of treatment are topical corticosteroids, immunosuppressive drugs, emollients, and calcineurin inhibitors. On the other hand, these treatments frequently have drawbacks such tachyphylaxis, hormone abnormalities, skin thinning, and systemic side effects after prolonged use. Additionally, some individuals might not respond to these drugs or have an allergy to them, which would call for different therapy strategies⁵⁻⁶.

The use of complementary and alternative medicine (CAM), especially herbal medicine, to treat long-term skin disorders like eczema has grown significantly in recent years. By addressing the fundamental reasons and enhancing general skin health, herbal medicine—which has its roots in traditional systems like Ayurveda, Traditional Chinese Medicine (TCM), and Unani—offers a comprehensive approach. Particularly when used over an extended period of time, herbal preparations are thought to be safer and more pleasant⁷⁻⁸.

The purpose of this review is to investigate how herbal remedies can be used to treat eczema. It explores the potential of herbal medications by a thorough examination of their pharmacological effects, clinical data, and future directions. It also covers the biology of the condition and assesses traditional treatments. This paper aims to provide a thorough overview of how herbal medicine can be included into eczema therapy by combining information from both contemporary research and traditional wisdom⁹⁻¹⁰.

Pathophysiology of Eczema:

A complicated interaction between immune system malfunction, environmental variables, genetic predisposition, and abnormalities of the skin

barrier leads to eczema. A mutation in the gene that codes for filaggrin, a crucial structural protein necessary for preserving the integrity of the skin, is one of the main causes of eczema. Increased Trans epidermal water loss, decreased natural moisturizing factors (NMFs), and damaged barrier function are all consequences of a degraded filaggrin function¹¹⁻¹².

A Th2-skewed immune response is the primary characteristic of immunological dysregulation in eczema. Interleukins like IL-4, IL-5, and IL-13 are released by T-helper 2 (Th2) cells and encourage the formation of IgE, the recruitment of eosinophils, and the inhibition of the skin's antimicrobial peptides. This cascade makes the skin more vulnerable to microbial colonization, especially by *Staphylococcus aureus*, in addition to causing inflammation.

Eczema symptoms can be made worse by environmental factors such dust mites, pollen, harsh soaps, detergents, stress, and food allergies. The weakened skin barrier permits allergens to enter after being exposed to these triggers, triggering an immunological reaction. The skin is further harmed by this vicious cycle of itching, scratching, and inflammation. Furthermore, the pathogenesis of eczema involves oxidative stress. The production of reactive oxygen species (ROS) in inflammatory skin can harm proteins, lipids, and DNA, which can lead to flare-ups and chronicity. Comprehending these pathways is essential for developing focused treatments, such as herbal remedies that target several facets of eczema pathology¹³⁻¹⁵.

Conventional Treatment Overview:

Reducing inflammation, relieving itching, repairing the skin barrier, and avoiding infections are the main goals of traditional eczema treatment. Treatment plans are usually customized according to age, the degree of skin involvement, and the severity of the disease¹⁶. Because topical corticosteroids have strong anti-inflammatory effects, they are the first-line treatment for acute flares. They function by reducing cytokine production and inhibiting immune cell invasion. However, long-term use is linked to negative side effects such striae, telangiectasia, hormone suppression, and skin thinning (atrophy).

Steroid-sparing alternatives include topical calcineurin inhibitors like tacrolimus and pimecrolimus. These substances work well in delicate regions like the face and eyelids because they prevent T-cell activation. They do, however, have a black-box warning because of their carcinogenicity. Although their efficacy varies, oral antihistamines are used to treat itching, especially at night. Systemic immunosuppressants such as cyclosporine, methotrexate, or azathioprine may be

used in cases that are severe or refractory. The treatment of eczema is at the forefront thanks to biologic medicines like dupilumab, which target certain cytokines like IL-4 and IL-13.

In order to restore barrier function and stop Trans epidermal water loss, emollients and moisturisers are crucial at every stage of eczema. Nevertheless, some formulations may irritate skin, and compliance is frequently difficult. Many patients still suffer from side effects, relapses, or insufficient alleviation despite these options, which has led to research into safer and more long-lasting therapy modalities like herbal medicine¹⁷⁻²⁰.

Role of Herbal Medicine in Eczema Management:

Traditional medical systems have traditionally employed herbal medicine to treat eczema and other skin conditions. These treatments provide a multifaceted strategy that includes immunomodulatory, anti-inflammatory, antibacterial and antioxidant effects. The goals of herbal remedies are to lessen irritation, fight infection, lower inflammation, and restore the integrity of the skin. The benefit comes from the combined action of several phytochemicals found in whole plant extracts, which frequently have complementary effects.

Aloe vera, for example, is well known for its anti-inflammatory, cooling, and moisturising qualities. It lessens irritation and encourages wound healing. Curcumin, a strong antioxidant and anti-inflammatory substance found in turmeric (*Curcuma longa*), alters a number of signalling pathways, including NF- κ B²¹⁻²⁵.

Because of their anti-pruritic and cleansing qualities, herbs like Manjistha (*Rubia cordifolia*) and Neem (*Azadirachta indica*) are used traditionally to treat eczema in Ayurveda. The corticosteroid-like properties of liquorice (*Glycyrrhiza glabra*) and the soothing, anti-itch, and anti-inflammatory properties of chamomile (*Matricaria chamomilla*) make them popular remedies.

Ointments, decoctions, oils, and creams are among the many herbal formulations that are used either by themselves or in conjunction with traditional therapies. Herbal medicines have been demonstrated in recent research to improve patient-reported outcomes and lower SCORAD (Scoring Atopic Dermatitis) indices. Additionally, using herbal medicine improves compliance and lowers the risk of side effects, particularly in older and paediatric groups. Herbal medicine is becoming more and more popular in dermatology as consumer preferences change towards sustainable and natural products²⁶⁻²⁷.

Common Herbal Plants Used in Eczema²⁸⁻³⁰:

Table.1: Common Herbal Plants used in Eczema

Botanical Name	Common Name	Active Constituents	Properties
<i>Aloe vera</i>	Aloe	Polysaccharides, Glycoproteins	Anti-inflammatory, Healing
<i>Azadirachta indica</i>	Neem	Nimbidin, Azadirachtin	Antibacterial, Antifungal
<i>Curcuma longa</i>	Turmeric	Curcumin	Anti-inflammatory, Antioxidant
<i>Glycyrrhiza glabra</i>	Licorice	Glycyrrhizin, Liquiritin	Corticosteroid-like
<i>Matricaria chamomilla</i>	Chamomile	Bisabolol, Flavonoids	Soothing, Anti-itch
<i>Calendula officinalis</i>		Triterpenoids, Flavonoids	Wound healing, Antiseptic

Mechanism of Action of Herbal Agents:

In treating eczema, herbal remedies have a variety of therapeutic benefits, mostly via anti-inflammatory, immunomodulatory, antioxidant, and antibacterial mechanisms. Herbal treatments often work by modifying several signalling pathways and re-establishing the integrity of the skin barrier, in contrast to traditional corticosteroids and immunosuppressant's. The suppression of pro-inflammatory cytokines such IL-1, IL-6, TNF- α , and IFN- γ is one of the main mechanisms. Curcumin and glycyrrhizin, found in herbs like liquorice (*Glycyrrhiza glabra*) and turmeric (*Curcuma longa*), respectively, inhibit NF- κ B signalling pathways, which lowers inflammation and itching.

Another important mechanism for reducing pruritus is the stabilization of mast cells and the suppression of histamine release. Aloe vera (*Aloe barbadensis*) and chamomile (*Matricaria chamomilla*) have been shown to have antihistaminic properties via inhibiting histamine-mediated cutaneous responses. Additionally, a lot of herbs have antioxidant properties that lessen oxidative stress in the skin, protecting the skin barrier from additional harm. Calendula (*Calendula officinalis*) and green tea (*Camellia sinensis*) contain flavonoids and polyphenols that scavenge free radicals and aid in skin repair.

Finally, antimicrobial plants like tea tree oil (*Melaleuca alternifolia*) and neem (*Azadirachta indica*) aid in avoiding subsequent bacterial infections, which are frequent in eczematous skin. These herbs function by breaking down the cell walls of microorganisms and stopping the production of biofilms³¹⁻³².

Clinical and Experimental Evidence:

The effectiveness of herbal remedies in treating eczema has been confirmed by several preclinical and clinical investigations. Topical

administration of herbal extracts such as liquorice, chamomile, and turmeric has been demonstrated to considerably reduce inflammation, oedema, and epidermal hyperplasia in experimental models in mice and rats. Turmeric extract, for example, significantly decreased dermatitis severity scores in a DNCB- induced atopic dermatitis model, according to a study published in the Journal of Ethno pharmacology. Similarly, it was discovered that topical aloe vera increased re-epithelialization and collagen formation in eczema lesions.

Randomized controlled trials (RCTs) have validated the efficacy of several herbal medicines in clinical settings. In comparison to a placebo, liquorice gel (2%) dramatically decreased erythema, scaling, and itching in eczema sufferers, according to a double-blind RCT with 120 participants. In treating mild to moderate eczema, a cream containing chamomile extract was assessed in another study that was published in Phytotherapy Research. The findings were similar to those of a cream that contained 0.5% hydrocortisone. Furthermore, in human volunteers, green tea extract has been shown to enhance skin barrier function and moisture retention.

Limitations include limited sample sizes, variations in herbal formulations, and a lack of standardisation present difficulties even though the evidence is encouraging. However, the potential of herbal medicine as a supplemental or alternative therapy is supported by consistently positive results from many investigations³²⁻³³.

Advantages of Herbal Medicine:

There are many advantages of using herbal medication to treat eczema. First and foremost, herbs are safe for long-term usage since they often have less adverse effects than immunosuppressant's and synthetic corticosteroids. Second, herbal remedies frequently target many processes, treating oxidative stress, microbial infections, and

inflammation—all of which are critical in the pathophysiology of eczema. Additionally, herbal formulations are frequently more readily available and reasonably priced, particularly in environments with limited resources. Treatment compliance can be increased by making them yourself as ointments, creams, or decoctions.

By encouraging skin regeneration and enhancing general skin health without producing thinning or reliance, herbal medicines can aid in holistic healing³³⁻³⁴.

II. Future Scope of Study:

In order to determine their place in dermatological treatments, systematic research and clinical evaluation are required due to the growing interest in herbal medicine worldwide. Standardizing herbal extracts, creating innovative herbal formulations, and investigating the synergistic effects of combination plant medicines should be the main areas of future research. For more focused and effective action, advanced delivery methods including liposomes and Nano emulsions can be investigated. Regulations must also be reinforced to ensure that marketed herbal products are safe, pure, and of high quality. Patients with eczema may have more treatment options if herbal medicine is included in dermatological guidelines. Lastly, to inform patients on the safe use of herbal medicine, potential interactions between herbs and medications, and appropriate application techniques, public awareness campaigns are to be carried out³⁴⁻³⁵.

III. Conclusion:

Eczema is still a difficult dermatological disorder that significantly affects quality of life and has recurrent symptoms. Herbal medicine's anti-inflammatory, antioxidant, and antibacterial qualities have made it a viable alternative therapy. In both clinical and experimental settings, traditional herbs like neem, liquorice, aloe vera, turmeric, and chamomile have demonstrated effectiveness. Notwithstanding promising outcomes, issues like regulatory loopholes, a lack of standardisation, and a lack of clinical trials need to be addressed. With more research, improved technology, and legislative backing, herbal medicine could emerge as a common treatment approach for safely and successfully treating eczema.

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