EURASIAN EXPERIMENT JOURNAL OF MEDICINE AND MEDICAL SCIENCES (EEJMMS)
ISSN: 2992-4103
©EEJMMS Publications Volume 6 Issue 3 2025

Traditional Medicine and Steroid Dependency: Evaluating the Efficacy and Safety of Ayurvedic, Chinese, and Indigenous Therapies

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ABSTRACT

Corticosteroids are essential in managing chronic inflammatory and autoimmune diseases but are often accompanied by severe adverse effects due to long-term use, leading to significant steroid dependency. This review evaluates the efficacy and safety of traditional medicine systems—Ayurveda, Traditional Chinese Medicine (TCM), and Indigenous therapies—in reducing corticosteroid dependency. These ancient medical practices employ herbal formulations and holistic interventions with demonstrated anti-inflammatory, immunomodulatory, and antioxidant properties that may serve as steroid-sparing strategies. The review synthesizes pharmacological mechanisms, clinical evidence, safety concerns, and integration challenges, including herb-drug interactions, quality control, and regulatory barriers. While promising data support traditional therapies' role in lowering steroid doses and mitigating side effects, further rigorous clinical validation and standardization are needed. The review underscores the potential of integrating traditional medicine with modern healthcare to offer culturally appropriate, safer alternatives for managing chronic diseases, ultimately aiming to improve patient outcomes and reduce corticosteroid-related complications globally.

Keywords: Corticosteroid dependency, Traditional medicine, Ayurveda, Indigenous therapies, Herbal medicine.

INTRODUCTION

Corticosteroids, also known as glucocorticoids, have long been foundational in the management of a wide array of chronic inflammatory and autoimmune conditions [1]. Their powerful anti-inflammatory and immunosuppressive properties make them invaluable in clinical settings for the treatment of diseases such as rheumatoid arthritis, asthma, systemic lupus erythematosus (SLE), inflammatory bowel disease (IBD), nephrotic syndrome, and many dermatological and neurological conditions [2]. By modulating immune function and suppressing inflammatory responses, corticosteroids can rapidly alleviate symptoms, prevent disease progression, and reduce the risk of complications. However, these benefits often come at a significant cost. The prolonged use of corticosteroids is associated with a host of adverse effects, including osteoporosis, diabetes mellitus, hypertension, peptic ulcers, immunosuppression, mood disorders, and suppression of the hypothalamic-pituitary-adrenal (HPA) axis [3]. These complications not only reduce the quality of life for patients but also undermine long-term treatment compliance and pose serious clinical challenges.

The need for safer alternatives or adjunctive treatments that reduce the dependency on corticosteroids has therefore become a pressing concern in both clinical practice and research. In this context, traditional medicine systems—such as Ayurveda from India, Traditional Chinese Medicine (TCM), and diverse Indigenous medical practices from Africa, the Americas, and Asia—are gaining increased attention [4]. These systems offer centuries-old therapeutic approaches that rely on natural substances, holistic care, and lifestyle interventions. Traditional therapies often employ herbal formulations, dietary prescriptions, spiritual practices, and physical therapies such as acupuncture and massage to restore balance within the body and promote healing. Some of these traditional interventions have shown promising anti-inflammatory and immunomodulatory effects in preclinical and clinical studies, suggesting that they may serve as effective steroid-sparing strategies [5].

The global burden of chronic inflammatory and autoimmune diseases continues to rise, driven by factors such as population aging, environmental triggers, dietary changes, and genetic predisposition. In managing these conditions, corticosteroids remain a mainstay, especially in settings with limited access to biologics or newer targeted therapies [6]. However, the long-term safety of corticosteroids is questionable, and there is a growing awareness of the need to mitigate their use. Simultaneously, traditional medicine systems are being increasingly validated through scientific research, leading to their greater integration into national healthcare frameworks and international guidelines [7].

Ayurveda, the traditional system of medicine in India, utilizes a wide variety of herbs and minerals to balance bodily doshas (Vata, Pitta, and Kapha). Herbs such as *Withania somnifera* (Ashwagandha), *Boswellia serrata* (Shallaki), *Curcuma longa* (Turmeric), and *Tinospora cordifolia* (Guduchi) have demonstrated anti-inflammatory, antioxidant, and immunomodulatory effects. Similarly, Traditional Chinese Medicine includes a variety of herbal formulations and practices such as acupuncture, moxibustion, and Qi Gong, which are believed to balance the Yin and Yang energies in the body. Key herbal components like *Tripterygium wilfordii* (Thunder God Vine) have been used in autoimmune disease management. Indigenous medicine systems across different continents also offer a treasure trove of ethnobotanical knowledge, much of which remains underexplored and undervalued.

In light of the growing popularity and demonstrated potential of these traditional systems, a comprehensive scientific review is essential to evaluate their efficacy and safety in reducing corticosteroid dependency [8].

Despite their efficacy, corticosteroids carry significant risks when used over extended periods. Chronic exposure leads to a range of serious adverse effects that can be debilitating, life-threatening, or lead to secondary health conditions requiring additional medical management. This dependency is particularly concerning in low-resource settings where patients may not have access to specialist care or monitoring, compounding the risk of complications [9].

Concurrently, while traditional medicine offers promising alternatives, its integration into mainstream medicine is hindered by insufficient clinical data, regulatory barriers, concerns about standardization, and skepticism regarding efficacy. Many clinicians are hesitant to recommend or allow the concurrent use of traditional therapies due to fears of drug interactions, inconsistent dosing, or lack of regulatory oversight [10].

The core problem, therefore, is the lack of a clear, evidence-based understanding of how traditional medicine can be safely and effectively used to reduce corticosteroid dependency. There is a critical need to bridge the gap between traditional knowledge and modern scientific evaluation to provide clinicians and patients with safe, validated, and culturally acceptable treatment alternatives [11]. This review aims to evaluate the potential of Ayurvedic, Chinese, and Indigenous therapies in reducing long-term dependency on corticosteroids by examining their pharmacological and clinical efficacy, safety profiles, mechanisms of action, and opportunities for integration into modern medical practice [12]. Specifically, the review investigates the anti-inflammatory and immunomodulatory effects of selected traditional remedies, their compatibility with corticosteroids in terms of safety and drug interactions, and the underlying biological mechanisms through which they may offer therapeutic benefits comparable to or supportive of corticosteroids [13]. It also identifies knowledge gaps and proposes future research directions to better inform clinical application and policy formulation. The central research questions guiding this review include identifying validated traditional therapies with steroid-sparing potential, determining whether they can effectively reduce corticosteroid dosage or treatment duration without compromising clinical outcomes, evaluating associated risks, understanding their mechanisms of action, and exploring practical pathways for integrating traditional and modern therapeutic approaches.

The study holds significance across various domains. For clinicians, it serves as a resource to inform safer, integrative treatment strategies; for researchers, it highlights areas needing further scientific investigation; and for policymakers, it offers a basis for incorporating traditional medicine into national healthcare frameworks. For patients, particularly those in resource-limited or culturally traditional settings, it promotes safe, accessible alternatives that may reduce the adverse effects of steroid use. On a broader scale, the review contributes to global health efforts to harness scientifically validated traditional knowledge in addressing the growing burden of chronic diseases. Ultimately, this study supports the development of culturally relevant, evidence-based strategies to minimize corticosteroid dependence while ensuring patient safety and expanding therapeutic options in clinical care.

Steroid Dependency and Its Clinical Challenges

Long-term corticosteroid therapy remains a cornerstone in the management of numerous chronic inflammatory and autoimmune conditions, including rheumatoid arthritis, asthma, systemic lupus erythematosus (SLE), and inflammatory bowel disease (IBD) [14]. While highly effective in controlling disease symptoms and flares, chronic steroid use is associated with a broad spectrum of adverse effects that present significant clinical challenges. Among these are Cushingoid features such as weight gain, moon face, and skin thinning, which impact patients' physical

appearance and psychological well-being. Immunosuppression resulting from corticosteroid use elevates the risk of opportunistic infections, posing a constant threat to patient health. Bone demineralization, or steroid-induced osteoporosis, further compromises mobility and increases fracture risk, especially in older adults. Another critical concern is adrenal insufficiency, which can occur when exogenous steroids suppress the hypothalamic-pituitary-adrenal (HPA) axis, impairing the body's ability to produce endogenous cortisol. Additionally, corticosteroids may induce psychological disturbances, including mood swings, anxiety, insomnia, and even psychosis, affecting quality of life and treatment adherence. These multifaceted complications underscore the need for alternative or adjunctive therapies that can either minimize the required steroid dosage or eliminate dependency altogether. The specific objective of this review is to evaluate the role of traditional medicine in addressing these challenges through safer, evidence-based interventions [15].

Overview Ayurvedic Medicine

Ayurveda, one of the oldest medical systems originating in India, emphasizes a holistic approach to health by integrating herbal formulations, dietary regulations, detoxification procedures like Panchakarma, and lifestyle modifications [16]. It operates on the principle of balancing the three doshas Vata, Pitta, and Kapha to maintain homeostasis. In the context of inflammatory and autoimmune conditions requiring corticosteroid therapy, Ayurvedic medicine offers promising alternatives that target both the symptoms and root causes of disease. Several herbs widely used in Ayurvedic practice have shown substantial pharmacological potential in reducing inflammation and modulating immune responses. For instance, *Boswellia serrata* (Shallaki) inhibits 5-lipoxygenase (LOX) and has demonstrated effects comparable to corticosteroids in the treatment of osteoarthritis and inflammatory bowel disease. *Withania somnifera* (Ashwagandha) exhibits immunomodulatory activity by balancing pro-inflammatory cytokines such as TNF-α and IL-6 and regulating cortisol levels. *Curcuma longa* (Turmeric), rich in curcumin, is known for its potent antioxidant and anti-inflammatory properties, acting through the suppression of NF-κB signaling pathways. *Tinospora cordifolia* (Guduchi) has been reported to enhance immune resilience and reduce inflammatory markers [17]. Clinically, Ayurvedic interventions have shown success in reducing corticosteroid dosage requirements in patients with conditions like rheumatoid arthritis and asthma, thereby minimizing long-term steroid-induced complications and enhancing patient compliance.

Traditional Chinese Medicine (TCM)

Traditional Chinese Medicine (TCM) represents a holistic medical system that has been practiced for thousands of years and is deeply rooted in the principles of balance, particularly the Yin-Yang theory and the regulation of Qi (vital energy) through meridians. The specific objective of this review, in the context of TCM, is to explore its potential as a steroid-sparing therapeutic approach in chronic inflammatory and autoimmune diseases [17]. TCM employs various modalities, including herbal medicine, acupuncture, and mind-body practices like Tai Chi, to restore physiological balance and alleviate symptoms. Several herbal formulations have shown promise in this regard. For instance, Bu Zhong Yi Qi Tang is used to enhance immune function and address fatigue, while Xiao Yao San is often prescribed to stabilize mood and hormonal imbalances, which may be exacerbated by long-term corticosteroid use. Tripterygium wilfordii Hook F. (Thunder God Vine) has demonstrated significant immunosuppressive activity and is being investigated for its steroid-reducing potential in diseases such as systemic lupus erythematosus. Clinical studies, including meta-analyses, suggest that TCM may help reduce corticosteroid dosages. However, concerns about herb safety particularly hepatotoxicity and infertility associated with certain compounds emphasize the need for standardization, regulation, and further clinical validation of TCM as a complementary therapy [18].

Indigenous and Ethnomedicinal Therapies

This review critically explore the role of Indigenous and ethnomedicinal therapies in reducing corticosteroid dependency in the management of chronic inflammatory and autoimmune diseases. Indigenous medical systems, practiced across Africa, South America, and Indigenous North American communities, are deeply rooted in local traditions and holistic healing philosophies. These practices commonly involve the use of herbal remedies, spiritual rituals, and culturally informed dietary prescriptions. Among the numerous botanicals employed, several have shown promising anti-inflammatory or immunomodulatory effects [19]. For instance, *Olax subscorpioidea*, widely used in West African ethnomedicine, has demonstrated anti-inflammatory activity in animal models, suggesting potential in managing steroid-dependent conditions. *Uncaria tomentosa* (Cat's Claw), traditionally used by Amazonian tribes, has exhibited tumor necrosis factor-alpha (TNF-α) inhibition, a key target in inflammatory pathways. Similarly, *Harpagophytum procumbens* (Devil's Claw) from Southern Africa is commonly utilized for the treatment of rheumatic and arthritic pain. Despite these promising leads, challenges persist, including limited scientific validation, inadequate pharmacological profiling, and concerns related to intellectual property and biopiracy. This review aims to highlight these therapies, assess their scientific underpinnings, and advocate for more rigorous clinical and pharmacological studies to evaluate their safety, efficacy, and integration into modern therapeutic frameworks.

Mechanisms of Action

This review elucidate the mechanisms by which traditional medicine systems—including Ayurvedic, Chinese, and Indigenous therapies—exert anti-inflammatory and immunomodulatory effects, potentially reducing dependency on corticosteroids. A growing body of evidence suggests that many traditional remedies modulate key inflammatory pathways, thereby mimicking or complementing the effects of corticosteroids. Notably, numerous herbal components have been shown to inhibit pro-inflammatory cytokines such as interleukin-1 (IL-1), interleukin-6 (IL-6), and tumor necrosis factor-alpha (TNF-α), which are central to the pathogenesis of autoimmune and chronic inflammatory diseases [20]. Additionally, some traditional compounds suppress cyclooxygenase (COX) and lipoxygenase (LOX) pathways, thereby reducing the production of prostaglandins and leukotrienes potent mediators of inflammation.

Traditional therapies also appear to influence neuroendocrine function, particularly by modulating the hypothalamic-pituitary-adrenal (HPA) axis and cortisol secretion, contributing to systemic anti-inflammatory effects. Furthermore, their antioxidant properties protect mitochondrial function and reduce oxidative stress, a key factor in chronic inflammation and tissue damage. Emerging research has also highlighted the ability of certain traditional formulations to regulate gut microbiota composition and diversity, which is increasingly implicated in immune system modulation and autoimmunity. By targeting multiple pathways simultaneously, traditional therapies may offer a holistic, multi-targeted alternative or adjunct to corticosteroid therapy [21].

Safety, Quality Control, and Integration with Modern Medicine

The integration of traditional medicine into modern clinical practice necessitates a careful examination of safety, quality control, and collaborative strategies. Despite their therapeutic potential, traditional remedies often face scrutiny due to inconsistent preparation methods, lack of standardization, and potential risks. One critical concern is the possibility of herb-drug interactions, particularly with corticosteroids. Certain herbs may potentiate or inhibit steroid metabolism, altering efficacy or increasing the risk of adverse effects. Additionally, traditional preparations are susceptible to contamination with heavy metals, pesticides, or adulterants, especially when quality control measures are inadequate [22]. In many countries, regulatory frameworks for traditional medicine remain underdeveloped, allowing unverified products to enter the market with little oversight. Variability in the concentration of bioactive compounds between batches further complicates dosage reliability and safety assurance.

Addressing these challenges requires a multifaceted approach. Complementary use of traditional medicines can offer a means to reduce corticosteroid dosages or alleviate side effects, but this necessitates open communication between patients and healthcare providers. Patient education is essential to ensure that traditional therapy use is disclosed and properly managed [11]. Collaborative healthcare models such as integrative clinics that bring together biomedical professionals and traditional healers can enhance treatment coordination and cultural relevance. Furthermore, partnerships between ethnobotanists, pharmacologists, and clinicians are crucial for developing evidence-based therapies through controlled studies. Standardizing extraction techniques, implementing rigorous safety testing, and harmonizing regulations are imperative steps toward ensuring that traditional medicine can be safely and effectively incorporated into mainstream healthcare for steroid-dependent conditions.

CONCLUSION

This review highlights the significant potential of Ayurvedic, Traditional Chinese Medicine (TCM), and Indigenous therapies as complementary or alternative approaches to reduce corticosteroid dependency in managing chronic inflammatory and autoimmune diseases. These traditional systems offer multi-targeted anti-inflammatory and immunomodulatory effects that may allow for lower steroid dosages, thereby minimizing the severe adverse effects associated with long-term corticosteroid use. However, despite encouraging preclinical and clinical evidence, challenges remain regarding safety, standardization, and regulatory oversight. Risks such as herb-drug interactions, contamination, and variability in bioactive compounds underscore the need for rigorous quality control and clinical validation. Effective integration into modern medicine requires collaborative healthcare models, patient education, and interdisciplinary research partnerships to ensure safe, evidence-based use. Ultimately, combining traditional therapies with contemporary medical practice holds promise for improving patient outcomes, reducing steroid-related complications, and expanding culturally acceptable treatment options. Continued scientific evaluation and policy support are essential to harness these therapies' full therapeutic potential and provide safer, accessible alternatives for steroid-dependent patients globally.

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CITE AS: Zakaria Ali (2025). Traditional Medicine and Steroid Dependency: Evaluating the Efficacy and Safety of Ayurvedic, Chinese, and Indigenous Therapies. EURASIAN EXPERIMENT JOURNAL OF MEDICINE AND MEDICAL SCIENCES, 6(3):116-121