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SYNERGISTIC EFFECTS ON IMMUNOMODULATION IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE): INTEGRATING AYURVEDIC AND CONVENTIONALTREATMENTS – A REVIEW

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ABSTRACT

Systemic Lupus Erythematosus (SLE) presents a complex autoimmune landscape characterized by dysregulated immune responses, leading to chronic inflammation and potential multi-organ involvement. The management of SLE encompasses a multifaceted approach aimed at controlling symptoms, preventing flares, and minimizing organ damage. Immunomodulating therapies that are not immunosuppressive, are a more attractive therapeutic option, offering the opportunity to modify the aberrant immune responses in SLE and thus prevent inflammation and subsequent damage without the risks of infection and malignancy. This review outlines the immunologic actions of these drugs by identifying the potential synergies between Ayurvedic and conventional treatments, assessing whether their combination enhances therapeutic outcomes beyond individual modalities.

KEYWORDS: SLE, Autoimmune conditions, Ayurveda, Rasayana, Immunomodulation.

INTRODUCTION

Systemic Lupus Erythematosus (SLE) presents a complex autoimmune landscape characterized by dysregulated immune responses, where the immune system attacks healthy tissues.Subsequent disease activity and tissue damage is mediated by autoantibodies, immune complexes and complement activation with numerous cytokine and interferon pathways implicated, leading to chronic inflammation and potential multi-organ involvement. The management of SLE encompasses a multifaceted approach aimed at controlling symptoms,

preventing flares, and minimizing organ damage. Immunomodulation therapy aims to regulate or modify the immune response. Common treatments include corticosteroids, immunosuppressive drugs like azathioprine or mycophenolate mofetil, and biologics such as belimumab. The therapies help manage symptoms and reduce the immune system's activity to prevent damage to organs. However, treatment plans may vary based on the severity of SLE and individual patient responses. Regular monitoring and collaboration with healthcare professionals are crucial for effective management.

Immunomodulating therapies that are not immunosuppressive, are a more attractive therapeutic option, offering the opportunity to modify the aberrant immune responses in SLE and thus prevent inflammation and subsequent damage without the risks of infection and malignancy. This review outlines the immunologic actions of these drugs by identifying the potential synergies between Ayurvedic and conventional treatments, assessing whether their combination enhances therapeutic outcomes beyond individual modalities.

AIM

To study the concept of Synergistic Effects on Immunomodulation in Systemic Lupus Erythematosus (SLE) by integrating Ayurvedic and conventional therapies.

OBJECTIVES

1. Association between Systemic Lupus Erythematosus (SLE) and the etiology of Ayurvedic disease i.e Vatarakta.
2. To study the immunomodulatory drugs mentioned in modern and ayurvedic sciences w.r.t SLE.

MATERIALS AND METHODS

The Bruhattrayi and Laghuttrayi, modern medical textbooks, journals and online databases like PubMed. Dhara, Google Scholar etc. were reviewed for this purpose.

METHODOLOGY

Understanding Systemic lupus erythematosus in Ayurveda:

Systemic lupus Erythematosus (SLE) is a systemic autoimmune disease in which organs and cells undergo damage mediated by tissue – binding autoantibodies and immune complexes. 90% of patients are women of child bearing age with a female to male ratio of 9:1.[1] The condition has several phenotypes, with varying clinical presentations from mild

mucocutaneous manifestations to multi organ and severe central nervous system involvement. SLE is a prototype example of type III hypersensitivity disease. Circulating antibodies to anti- nuclear antibodies which are directed against a variety of nuclear constituents (such as nucleosomes, DNA, Sm, U1RNP etc.) get deposited at various sites giving rise to malar rash, Photosensitivity, arthritis, glomerulonephritis, serositis and central nervous system involvement in SLE.[2] The main causative factors which can results into autoimmunity they are - genetic susceptibility, environment factors, sex and abnormal immune response due to infection.[1] SLE can be considered under the purview of Vatarakta because of its similarity of symptoms with Raktadhika Vatarakta. And can be understood under the banner of Uttana and Gamhira Vatarakta.

In **Uttana Vatarakta**, mainly Twak and Mamsa will be affected which can be presented with symptoms of Kandu, Daha, Ruk, Toda, Spurana, Tamra Vivarnata due to vitiated Rakta at the level of Twak and Mamsa which leads to Shotha (inflammation). In **Gambheera Vatarakta**, Asthi, Sandhi & Majja will be affected which presents with symptoms of Sandhi Shoola, Sandhi Shotha and Tamra Vivarnata at the affected joints and later it leads to Vakrata of Sandhi.[3] This can be understood as arthritis which is a common symptom seen in 90% of patients later it may present with deformity of the joints as a result of tendon damage.[4]

Acharya Sushruta has explained that just like Kushta, Vatarakta initially affects the Twak, Mamsa and later it affects the Gambhira Dhatu. SLE is a condition where it affects all the system of the body. Hence, it is categorized under multi system autoimmune disease. In case of mild condition, it is only restricted to Skin and in severe cases the inflammation takes place in different systems like joints, kidney, Cardiovascular, lungs, neurological, Gastrointestinal systems. So, it can be staged into Uttana and Gambhira Vatarakta because of its multisystem involvement.[5]

Chikitsa- Vatarakta being a systemic disease, the management is aimed at controlling vata, pitta while normalizing the Raktadushti. Generalized treatment guidelines include Basti, Raktamokshan, Alepana, Upanaha, Snehapana etc. as these practices help to break the obstruction and expulsion of vitiated doshas.[2]

However, despite undergoing these particular treatments, the illness occasionally re-emerges, creating challenges in the daily lives of patients. This is where the significance of preventive therapy becomes evident. Rasayana drugs, as elucidated in Ayurvedic texts, play a crucial

role in addressing these challenging situations by either minimizing inflammation or at least diminishing the severity of these flare-ups. This study explores the synergistic effects of integrating Ayurvedic immunomodulatory strategies with conventional treatments to achieve a more balanced and targeted approach to immune system regulation in SLE patients, by involving a comprehensive assessment of immunomodulatory outcomes, comparing the effects of Ayurvedic interventions with conventional immunosuppressive medications.

Rasayana tantra is one of the 8 clinical specialties of Ayurveda. It can be a drug, diet or even a lifestyle and conduct i.e Achar, which can be helpful in strengthening Oja and Bala i.e vitality and biostrength with natural resistance against aging and disease. If Rasayana is adopted after samshodhana chikitsa produces healthier dhatus in the presence of Agni and thus improves the Vyadhikshamatva of an individual. Some of the Rasayans which have been subjected to scientific studies and found to possess immunomodulatory effect.

Single Drugs & their action

- **Aswagandha** (*Withania somnifera*) – Anticomplementary, anti-inflammatory, antioxidant.
- **Shilajatu** (*Asphaltum punjabianum*)- Anticomplementary, helps in complications like SLE nephritis.
- **Amalaki** (*Emblica officinalis*)– Anticomplementary, immunostimulant,cytoprotective.
- **Tulasi** (*Ocimun sanctum*)- Anticomplementary, hepato-neuro-cardio protective, anti-allergic.
- **Guduchi** (*Tinospora cordifolia*)– Anticomplementary, antidiabetic, anti-inflammatoryand hepatoprotective activities.
- **Pippali** (*Piper longum*)- Anticomplementary, antioxidant, free radical scavengingactivity.
- **Punarnava** (*Boerhavia diffusa*)– Nerve rejuvenator, excellent diuretic so helps in complications like SLE nephritis
- **Yashtimadhu** (*Glycyrrhiza glabra*)– Immune-stimulative, antiallergic, anti-inflammatory and antioxidant activity.

Ayurvedic Formulations & their action

- **Chyavanprash Avaleha**- Potenciates both the cellular and humoral components of immunity.
- **Amalaki Rasayana**– Helps to increase in immunoglobulin levels.

- **Vardhaman Pippali Rasayana**- Antioxidant, free radical scavenging activity.

Immunomodulation as per modern science: Current treatment strategies rely heavily on corticosteroids, which are in turn responsible for a significant burden of morbidity, and immunosuppressives which are limited by suboptimal efficacy, increased infections and malignancies. There are significant deficiencies in the immunosuppressive therapies, making immunomodulatory therapies crucial, offering the opportunity to prevent disease flare and the subsequent accrual of damage. Currently available immunomodulators include prasterone (synthetic dehydroeipandrosterone), vitamin D, hydroxychloroquine and belimumab. These therapies, acting via numerous cellular and cytokine pathways, have been shown to modify the aberrant immune responses associated with SLE without overt immunosuppression.

Table No. 1: Immunomodulatory drugs and their mode of action.[6]

SR. NO.	DRUG	MODE OF ACTION
1.	Vitamin D	Can be used as supplementation, helps inreducing proteinuria, suppress immune response, has a good impact oncardiovascular outcomes.
2.	Belimumab	Partial depletion of B-cells leading toreduced levels of antibodies.
3.	Hydroxychloroquine	Reduces flares, helps in treating cutaneous disease and inflammatory arthralgia, reducesthrombosis, better glycemic control and BP.
4.	Dehydroepiandrosterone	Bone protective properties, anti-inflammatory.

DISCUSSION

The corticosteroids commonly employed in treating systemic lupus erythematosus (SLE) exhibit predominantly immunosuppressive effects, resulting in side effects. Therefore, it is advisable to consider immunomodulatory drugs that pose fewer or no adverse effects. These medications not only assist in minimizing the occurrence of repeated flares but also contribute to addressing complications. The study aims to contribute valuable insights into the feasibility, effectiveness, and patient-centered outcomes of combining Ayurvedic and conventional treatments for immune system regulation in SLE.

CONCLUSION

This research signifies a step towards a more holistic and personalized approach to SLE management, embracing the potential synergies between traditional Ayurvedic wisdom and modern medical interventions for the benefit of individuals living with this challenging autoimmune condition. Study explores how the integration of Ayurvedic immunomodulatory

strategies complements conventional immunosuppressive treatments, aiming for a more balanced and targeted approach to immune system regulation.

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