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Autoimmune Diseases and Diet Modification: A Comprehensive Review

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Abstract:

An abnormal immune response to self-antigens is the hallmark of a wide range of conditions known as autoimmune diseases (AIDs), which cause tissue damage and persistent inflammation. AIDs is a complex aetiology that includes lifestyle variables, environmental triggers, and genetic predisposition. One of them that may be changed to affect the development and course of autoimmune diseases is food. This study highlights the possibility of diet modification as a treatment approach by examining the connection between autoimmune disorders and dietary habits.

Keywords: *Autoimmune Diseases (AIDs), Ayurvedic Dietetics, Herbal Diets, Anti-inflammatory Nutrition, Gut Microbiota, Omega-3 Fatty Acids*

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INTRODUCTION:

About 5–10% of people worldwide suffer from autoimmune illnesses, with women being more likely to have them than males (Davidson & Diamond, 2001). Rheumatoid arthritis (RA), multiple sclerosis (MS), systemic lupus erythematosus (SLE), type 1 diabetes mellitus (T1DM), and inflammatory bowel disease (IBD) are common AIDSs. Although pharmaceutical treatments continue to be the mainstay of managing AIDS, there is rising research in how nutrition might affect immune responses and disease activity [1]. Herbal diets, which have their roots in ancient customs, are becoming more popular due to their possible health advantages. The bioactive substances found in herbs are examined in this review, along with their medicinal uses, integration with contemporary medicine, and safety and effectiveness issues. For millennia, herbs have played a significant role in both human diets and ancient medical systems like Ayurveda. Their antioxidant, anti-inflammatory, and medicinal qualities are attributed to their abundance of bioactive substances, such as tannins, phenolic diterpenes, and alkaloids (Arooj & Khalid, 2024). The global trend towards natural and holistic health practices is consistent with the renewed interest in herbal diets.[2]

Concept of Diet in Ayurveda: Acharya Charaka explains the fundamentals of dietetics, dosha balance, digestion (Agni), and daily rituals (Dinacharya). One of the three pillars of life is ahara, or food. The eight guidelines or factors for appropriate food consumption in Ayurveda are known as Ashtavidha Aahar Vidhi. According to traditional Ayurvedic literature like Ashtanga Hridaya and Charaka Samhita, following these rules is crucial for preserving digestion and overall health [3].

Nutrition in Ayurveda (Pathya-Apathya Vijnana): The study of food and nutrition according to Ayurvedic principles is known as Ayurvedic dietetics. It places a strong emphasis on individualised diet according to a person's age, season, area, dosha balance, digestive fire (Agni), and constitution (Prakriti). Maintaining health, preventing illness, and promoting healing are the objectives [4].

Core Principles of Ayurvedic Dietetics:
Theory of Tridosha
• The three doshas that regulate the body and mind—Pitta, Kapha, and Vata—are the foundation of Ayurveda.
• The inflamed doshas are balanced by the foods chosen.
Vata: Prefer items that are warm, moist, greasy, and grounding (such as soups and ghee).
Pitta: Prefer moderate, cooling, and non-spicy meals (cucumber, milk, etc.).
Kapha: Prefer meals that are warm, dry, light, and spicy such as barley and ginger [5]

Digestive Fire, or Agni: Agni is essential for metabolism and digestion.
Agni types include:
Sama Agni, or balanced, is the optimum condition. Vishama Agni, or irregular, is frequently observed in cases of Vata imbalance. Pitta surplus is associated with

Tikshna Agni (Intense). Manda Agni (Weak) – associated with Kapha. Diet should match your Agni to maintain health and prevent *Ama* (toxins from undigested food) [6]. Diet as Medicine: Ayurveda regards food as the first medicine: *"Annaha Brahma" – Food is divine.*

- Ahara is one of the three pillars of life (*Traya Upastambha*): Ahara (food), Nidra (sleep), and Brahmacharya (discipline).
- Many conditions (e.g., acidity, diabetes, skin disorders) are treated with specific dietary regimens (*Ahara Chikitsa*) [7].

The Role of Diet in Autoimmune Diseases

Inflammation and Immune Modulation

One of the hallmarks of AIDS is chronic inflammation. Dietary factors can affect immune cell activity and inflammatory pathways. For example, pro-inflammatory cytokines are inhibited by omega-3 fatty acids, which results in anti-inflammatory effects (Calder, 2006). On the other hand, diets heavy in refined carbohydrates and saturated fats might exacerbate inflammation [8].

Gut Microbiota and Autoimmunity: Immune homeostasis is significantly influenced by the gut microbiome. AIDs have been linked to dysbiosis, or an imbalance in the makeup of gut microbes (Belkaid & Hand, 2014). Diet has a big impact on gut microbiota; for instance, diets high in fibre encourage good bacteria, whereas diets high in fat can cause dysbiosis [9]. Dietary Habits and Immune System Disorders, Mediterranean Diet, Rich in fruits, vegetables, whole grains, legumes, seafood, and olive oil, the Mediterranean diet (MD) has been linked to better AIDS results and decreased inflammation. Following the MD was associated with less disease activity in RA patients. Likewise, in MS, longer relapse-free durations were associated with stronger MD adherence [10].

Gluten-Free Diet: For the treatment of coeliac disease, an autoimmune disorder brought on by gluten, a gluten-free diet (GFD) is crucial. According to some research, by lowering antibody levels, GFD may help treat other AIDs including Hashimoto's thyroiditis. To prove its effectiveness in non-celiac further study is necessary as the evidence is conflicting [11].

Diet of the Autoimmune Protocol: An elimination diet called the Autoimmune Protocol (AIP) diet is intended to detect dietary sensitivities and lower inflammation. It entails eliminating possible food triggers and reintroducing them gradually. Initial research indicates that when IBD patients follow the AIP diet, their symptoms and quality of life improve [12].

Ketogenic Diet: The ketogenic diet (KD), which is low in carbs and high in fats, causes ketosis and has shown promise in the treatment of neurological AIDS, such as multiple sclerosis. KD may lessen inflammation and demyelination, according to research on animals [13, 14]. Plant-Based Diets, Antioxidants and fibre are abundant in plant-based diets that prioritise fruits, vegetables, legumes, and whole grains. These diets may lower inflammation and alter immunological responses. Plant-based diets have been linked to lower disease activity in SLE patients. Numerous

compounds found in herbs provide a range of health advantages [15].

Turmeric (Curcuma longa): contains curcumin, which has antioxidant and anti-inflammatory qualities. Curcumin may help decrease cholesterol and lessen the accumulation of arterial plaque, according to studies. Zingiber officinale, or ginger: Packed with gingerols, it improves metabolism and lowers inflammation to have anti-obesity properties. Ginger also helps control heart disease and diabetes. Carnosic acid and rosmarinic acid, which are found in rosemary (Rosmarinus officinalis), have antioxidant and anti-inflammatory properties that may help reduce chronic inflammation [16].

Nutrients and Autoimmune Diseases: Fatty Acids Omega-3 Walnuts, flaxseeds, and fish oil are good sources of omega-3 fatty acids, which have anti-inflammatory properties. It has been demonstrated that supplements lower disease activity in SLE, and RA [17].

Vitamin D: Immune modulation is influenced by vitamin D. Increased risk and severity of AIDs, including MS and T1DM, have been associated with deficiencies (Holick, 2007). Although further research is needed to determine the ideal dosage, supplements may help regulate immune responses [18]. Antioxidants, Vitamins A, C, and We are examples of antioxidants that fight oxidative stress, which fuels inflammation in AIDS. Antioxidant-rich diets may aid in the management of illness [19]

Challenges and Considerations: While diet modification holds promise, challenges include individual variability in responses, adherence to restrictive diets, and potential nutrient deficiencies. Personalized nutrition, guided by healthcare professionals, is essential for effective management.

DISCUSSION:

Autoimmune diseases (AIDs), which affect 5–10% of the global population, present a significant challenge due to their chronic inflammatory nature and complex immune dysregulation. While pharmaceuticals remain the cornerstone of treatment, growing research highlights the potential of diet, particularly herbal and Ayurvedic approaches, in modulating immune responses. Ayurvedic dietetics, rooted in concepts like Tridosha, Agni, and individualized nutrition (Pathya-Apathya), emphasizes balance and digestion as keys to health, offering ancient yet relevant strategies for managing AIDs.

Modern diets such as the Mediterranean, Autoimmune Protocol (AIP), and ketogenic diets also show promise in reducing inflammation and improving symptoms in conditions like RA, MS, and IBD. The role of gut microbiota is central, with fiber-rich, plant-based diets promoting beneficial microbial balance and reducing disease severity. Bioactive compounds in herbs like turmeric, ginger, and rosemary demonstrate anti-inflammatory, antioxidant, and metabolic benefits.

Key nutrients like omega-3 fatty acids, vitamin D, and antioxidants further support immune modulation. However, challenges remain in terms of individual variability,

compliance, and risk of nutrient deficiencies. Hence, integrating traditional wisdom with evidence-based nutrition through personalized dietary planning can offer a complementary path to managing autoimmune diseases effectively.

CONCLUSION:

An important factor in the treatment of autoimmune illnesses is diet. Modifying immune responses and lowering disease activity may be achieved by implementing anti-inflammatory dietary patterns, such as the Mediterranean or plant-based diets, and making sure that important nutrients like vitamin D and omega-3 fatty acids are consumed in sufficient amounts. Standardised dietary recommendations for AIDS require more investigation. Herbal diets, which combine ancient methods with contemporary scientific support, present a viable path towards improving health and avoiding illness. However, it is crucial to ensure safety via clinical research and strict quality control. Herbal diets might be a key component of holistic health methods as interest in natural health remedies increases.

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