


Chapter 4

Association Between Dietary Components and Autoimmune Diseases: Case Study

Payal Das

 <https://orcid.org/0009-0006-7537-2978>

University of Calcutta, India

Pubali Dhar

University of Calcutta, India

ABSTRACT

Autoimmune diseases are conditions characterized by the body's immune system attacking its own healthy cells. Researchers have recognized more than 100 autoimmune diseases and their various causes. Recent research indicates that dietary factors, such as reduced intake of Vitamin D, sodium chloride in diet, milk protein, gluten sensitivity, and consumption of coffee may impact the progression and advancement of autoimmune diseases. Precision nutrition is an emerging field of research designed to provide personalized and unbiased nutritional advice that is more suitable than general guidelines for individuals or group of individuals for managing various aspects of healthcare. This literature review aims to examine the current evidence indicating the significant association between these dietary factors and autoimmune diseases including epidemiological investigations, clinical trials, meta-analyses that will provides useful insights into this topic. However, findings from different studies on specific autoimmune conditions vary.

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INTRODUCTION

Food is essential for survival, and it is undeniable that our daily consumption greatly affects our physical, psychological and social well-being. It can have both beneficial and detrimental effects, often being likened to medicine (Gershteyn et al., 2020). To comprehensively comprehend the impact of food on health, a detailed understanding of its nutritional elements and molecular components is necessary. Food is more than just sustenance for the body; it holds significant social and cultural value and can also have a profound impact on mental and emotional well-being.

Moreover, scientific research continues to uncover the intricate ways in which different nutrients and compounds in our diet interact with our bodies, influencing gene expression, hormone regulation, and overall physiological function. The emerging field of nutrigenomics explores how our individual genetic makeup influences our body's response to various components of our diet, revealing the personalized nature of nutritional requirements and their numerous effects on health (Bush et al., 2020; Toro-Martín et al., 2017). This suggests that a standardized dietary approach may not be effective for individuals with autoimmune diseases, and personalized dietary recommendations informed by genetic and metabolic profiles may be necessary.

Precision Nutrition is an emerging field of research designed to provide personalised and unbiased nutritional advice that is more suitable than general guidelines for individuals or group of individuals for managing various aspects of health care (Kirk et al., 2021; Toro-Martín et al., 2017).

Autoimmune diseases are conditions characterised by the body's immune system attacking its own healthy cells. They are a group of complex and multifactorial conditions (Banolas et al., 2023; Mazzucca et al., 2021; Meydani et al., 2020). Multiple factors include genetic, immunological, hormonal and environmental factors.

Diet is considered as one of the major environmental factors for autoimmune diseases yet the interaction of various dietary factors normally present in our food with immune system remains obscure (Calder et al., 2009; Gershteyn et al., 2020; Vorobyev & Ludwig, 2023). Understanding this association could lead to the development of preventive and therapeutic approaches that could significantly impact the patients health. Even though the etiology and pathophysiology of the auto-immune diseases are not fully understood several studies have elucidated the common mechanism by which different dietary components can influence the development of an auto-immune disease. For instance, certain dietary factors have been associated with elevated or reduced risk of auto-immune diseases. Elucidating these mechanisms is essential for understanding the intricate relationship between dietary components and autoimmune diseases. It is a critical step towards developing targeted dietary interventions and personalized nutrition strategies for individuals with autoimmune conditions. Moreover, it is noteworthy to mention that the effects

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