

Antibiotic Supplementation's Immunostimulatory Benefits on Asthma Patients: A Randomized, Double-Blind, Placebo-Controlled Trial

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Abstract

Background: Asthma is seen as an ongoing inflammatory condition of the airways. Living bacteria called probiotics are prevalent in the human stomach and have been shown to be protective against a variety of illnesses, including allergies. This study sought to better understand how probiotic treatment for asthma affected patients' clinical symptoms, changes in the expression pattern of specific microRNAs, and changes in plasma levels of IL-4 and IFN- γ . miR-16, miR-146-a, and IL-4 levels in asthma patients while considerably increasing the expression of miR-133b. Furthermore, following taking probiotics, pulmonary function tests revealed a significantly improved Forced Expiratory Volume in 1 s and Forced Vital Capacity.

Conclusion: In our investigation, an 8-week probiotic supplementation regimen decreased IL-4 linked with Th2 cells and increased forced vital capacity and forced expiratory volume. The use of probiotics seems to be an option in addition to conventional asthma therapies.

Keywords: Asthma, Probiotics, Immunostimulation, Clinical symptoms, miRNAs, Pulmonary function tests

Introduction

Asthma is a chronic inflammatory condition of the airways characterized by airway hyperresponsiveness, inflammation, and reversible airflow obstruction. It is a leading cause of morbidity and mortality worldwide. The pathogenesis of asthma is complex and involves a combination of genetic and environmental factors. Inflammation is a key feature of asthma, and it is thought to be driven by an imbalance between pro-inflammatory and anti-inflammatory responses. The immune system plays a central role in the pathogenesis of asthma, and there is growing interest in the potential of probiotics to modulate the immune system and improve clinical outcomes in asthma patients. Probiotics are live microorganisms that, when administered in adequate amounts, confer a health benefit on the host. They are found in various foods and supplements, and they have been shown to have a variety of health benefits, including improved gut health, enhanced immune function, and reduced risk of infection. In the context of asthma, probiotics are thought to exert their effects through several mechanisms, including modulation of the gut microbiome, which in turn influences the immune system. The gut microbiome is a complex community of microorganisms that reside in the human gut, and it has been shown to play a role in the development and regulation of the immune system. Probiotics are thought to modulate the gut microbiome by increasing the abundance of beneficial bacteria and reducing the abundance of harmful bacteria. This, in turn, is thought to lead to improved immune function and reduced inflammation. Several studies have shown that probiotic supplementation can improve clinical outcomes in asthma patients, including reduced symptoms, improved lung function, and reduced risk of exacerbations. However, the mechanisms underlying these effects are not fully understood, and more research is needed to clarify the role of probiotics in asthma. This study aimed to investigate the immunostimulatory benefits of probiotic supplementation in asthma patients. The study was a randomized, double-blind, placebo-controlled trial that evaluated the effects of an 8-week probiotic supplementation regimen on clinical symptoms, changes in the expression pattern of specific microRNAs, and changes in plasma levels of IL-4 and IFN- γ . The results of the study showed that probiotic supplementation significantly improved clinical symptoms, increased the expression of miR-133b, and reduced the expression of miR-16 and miR-146-a. Additionally, probiotic supplementation significantly improved lung function, as measured by Forced Expiratory Volume in 1 s and Forced Vital Capacity. These findings suggest that probiotic supplementation may have immunostimulatory benefits in asthma patients, and they may be a useful adjunct to conventional asthma therapies.

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