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β-glucans and immunity: a new paradigm in metabolic syndrome

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Abstract

The innate immune system responds in a rapid and nonspecific manner against immunologic threats. Inflammation is part of this response. This is followed by a slower but targeted and specific response known as adaptive or acquired immune response. There is emerging evidence that polysaccharides such as Saccharomyces-derived carbohydrates can aid host defense against pathogens by modulating inflammatory and antimicrobial activity of neutrophils and macrophages. Trained immunity refers to a newly recognized phenomenon wherein compounds may "train" immune cells. Under the umbrella of trained immunity, a broad protection can be achieved by: (i) increasing the nonspecific effector response of innate immune cells (e.g., monocyte/macrophages) to pathogens, (ii) harnessing the activation state of dendritic cells to enhance adaptive T cell responses to both specific and nonrelated (bystander) antigens. This capacity to promote responses beyond their nominal antigens may be particularly useful when conventional vaccines are not available or when multiple coinfections and/or recurrent infections arise in susceptible individuals. Besides the therapeutical β-Glucans subcutaneous evidences in URTI's and RUTI's, oral administration of β-Glucans evidences demonstrate immunological benefits for obesity and metabolic syndrome patients during treatment protocols. Obese and metabolic subjects has higher laboratorial parameters such as: fasting glucose, insulin, Free Fat Acids, total and LDL cholesterol, Triglycerides, C Reactive Protein (CRP), serum leptin, IL-6, sgp130, IL-18. Also lower insulin sensitivity, HDL-cholesterol, and serum adiponectin in comparison to normal-weight subjects. Recent evidences discuss the efficacy of β-Glucans in metabolic subjects by altering the gut microbiota in individuals with obesity and metabolic syndrome. In altering gut microbiota, β-glucan increased the species richness, reversed the populations of 7 bacterial genera and increased butyrate producers including Ruminococcaceae and Lachnospiraceae which enhance gut barrier protection and regulate glucose homeostasis. This leads to reduction of inflammation and benefits on laboratorial parameters. The aim of this observation study is to determine whether these evidences are supported with the subcutaneous trained immunity β-Glucan protocol in subjects with metabolic syndrome.

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Biography

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