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β -(1→3,1→6)-D-glucans in disease prevention and health promotion - a systematic review of randomized controlled trials

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Abstract

Introduction: β -Glucans comprise a heterogeneous group of polysaccharides exhibiting a wide range of biological properties. They are categorized as dietary fibers due to their ability to reach the large intestine undigested and undergo fermentation by gut microbiota, with potential beneficial effects for the host. Aim of this systematic review is to assess the effects of consumption of β -(1→3,1→6)-D-glucans, naturally found in the cell walls of fungi, on health outcomes.

Methods: A comprehensive literature search was performed on PubMed, Cochrane Library and Web of Science in order to retrieve studies that investigated the impact of exclusively oral administration of β -(1→3,1→6)-D-glucans to healthy individuals and/or patients in any form, at any dosage. Only randomized controlled trials (RCTs) were considered.

Results: Twenty-five RCTs, of the 48 clinical studies retrieved in total, met the eligibility criteria and are included in the present review. The sources of β -(1→3,1→6)-D-glucans were *Saccharomyces cerevisiae*, *Aureobasidium pullulans*, *Pleurotus ostreatus* and *Lentinula edodes* and the dosage of supplementation ranged from 2.5 to 3000 mg daily for up to 6 months. The main physiological outcome for the majority of the interventions was immunomodulation, which resulted in a) strengthened immune defence that reduces the incidence and symptoms of cold, flu and upper respiratory tract infections in general and b) alleviation of allergic symptoms. However, findings on the induction of immune response alterations were inconsistent at a cellular and molecular level. Another aspect is psychological wellbeing, as the cohorts that received the polysaccharides of interest reported improvement of mood state as well as amelioration of the wellbeing overall, while co-administration with chemotherapeutic drugs enhanced cancer patients' quality of life and prolonged their survival. Furthermore, supplements containing β -(1→3,1→6)-D-glucan induced beneficial changes in body fat mass and abdominal circumference in overweight adults. Notably, no adverse event causally related to the glucans was recorded in any of the trials.

Conclusions: Supplementation with β -(1→3,1→6)-D-glucans is well-tolerated and health-promoting properties are manifested primarily through the potentiation of the immune system. More studies are required in order to confirm additional beneficial effects, establish the optimal dose and reveal the underlying molecular mechanisms.

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Conflict of Interest

There is no conflict of interest