

Mushroom Research Abstract

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White button, Shiitake, and Portabella mushrooms modulate the development of collagen-induced arthritis in mice.

S. Kuvibidila, H. Alexander, YF Lim, L. Christopher, E. Lucas, S.L. Clarke, B.J. Smith. Department of Nutritional Sciences, Oklahoma State University, Stillwater, OK 74078, USA.

Mushrooms have been used in ancient Chinese medicine for treatment and prevention of many diseases due to their immunomodulatory properties. However, less work has been conducted on the white button mushrooms, commonly found in US. The objective of this study was to examine the extent to which diets fortified with 5% white button mushrooms (WM), shiitake (SM), and portabella (PM), can prevent the development of collagen-induced arthritis (CIA) in mice, an experimental model for the human disease. Eight-week old DBA female mice (n=110) were fed either the AIN76 (baseline, n=37) diet or the experimental diets (n=19-27/group) for 6 weeks. After intradermal injection of a single dose of 100 ug bovine collagen type II to 50% of the mice, a single dose of 50 ug LPS was given by intraperitoneal injection on 20d post immunization. Paw swelling was assessed by three different investigators between day 4, 5, and 6 after LPS injection. The percentage of mice that developed paw swelling was as follows: 100%, 83%, 54%, and 64% for PM, baseline, WM, and SM diets, respectively ($p < 0.05$). None of the mice that received the vehicle developed CIA. The mean arthritis index (paw swelling severity) was also higher in PM fed mice (9.0) than in the other groups (5.67-6.86). Mushrooms tended to decrease TNF- α and IL-6 levels in CIA mice by 22-46%. Although mean body weights slightly decreased in CIA mice, they were not affected by mushroom fortification. Data suggest that WM and SM appear to provide protection from the development of CIA but may not alter the severity of the disease. Supp.: Grant # 580790706 (Mushroom Council/USDA/NutriCore) and funds from Oklahoma State University.