



Modulation of immune cell proliferation and chemotaxis towards CC chemokine ligand (CCL)-21 and CXC chemokine ligand (CXCL)-12 in undenatured whey protein-treated mice

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Abstract:

Whey protein concentrates (WPCs) enhance innate mucosal immunity during early life and have a protective role in some immune disorders. To further elucidate the potential benefits of this protein, the present study investigated the effect of dietary supplementation with WPCs on blood parameters, plasma cytokine profiles, and immune cell proliferation and chemotaxis. A total of 45 male mice were equally distributed into three experimental groups and treated daily for 21 days as follows: group I was a control group that was orally supplemented with distilled water, group II was orally supplemented with undenatured WP (100 mg/kg body weight), and group III was orally supplemented with bovine serum albumin (100 mg/kg body weight). We found that the plasma cytokine levels of interleukin (IL)-1 β , IL-1 α , IL-10 and tumor necrosis factor- α and the levels of reactive oxygen species, cholesterol, triglycerides and the lipid profile were significantly decreased in the WP-treated group compared to the control group. In contrast, the levels of IL-2, IL-4, IL-7, IL-8 and glutathione were significantly elevated, and consequently, the ability of peripheral blood mononuclear cells to proliferate in response to stimulation with different antigens was significantly increased in the WP-treated group. Moreover, the in vitro chemotaxis of B, T and bone-marrow-derived dendritic cells toward CC chemokine ligand- 21 and CXC chemokine ligand-12 was significantly increased, by twofold, in WP-treated mice compared to the control group. Taken together, our data reveal the benefits of WP supplementation in enhancing immune cell proliferation and migration to the secondary lymphoid organs. © 2012 Elsevier Inc. All rights reserved.

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