



Camel whey protein improves lymphocyte function and protects against diabetes in the offspring of diabetic mouse dams

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Abstract:

The prevalence of health problems in the offspring of pregnant diabetic mothers has recently been verified. Therefore, the present study was designed to investigate the influence of dietary camel whey protein (CWP), administered as a supplement to streptozotocin (STZ)-induced diabetic pregnant mice, on the efficiency of the immune system of the offspring. Three groups of female mice (n = 10) were used: non-diabetic control mice, diabetic mice, and diabetic mice orally administered CWP during the pregnancy and lactation periods. We then tested the immune response of B and T cells in adult male offspring (n = 15 in each group) by using flow cytometry, western blotting, and ELISAs. Our data demonstrated that the offspring of diabetic dams exhibited several postpartum complications, such as significant aberrant overexpression of activating transcription factor-3 (ATF-3), significant elevation of the plasma levels of pro-inflammatory cytokines (IL-1 β , IL-6, and TNF- α) and reactive oxygen species (ROS), marked decreases in the plasma levels of IL-2 and IL-7, significant inhibition of CCL21- and CXCL12-mediated chemotaxis of B- and T-lymphocytes, and a marked decrease in the proliferative capacity of antigen-stimulated B- and T-lymphocytes. Interestingly, administration of CWP to diabetic dams substantially restored the expression of ATF-3 and the levels of ROS, pro-inflammatory cytokines, IL-2, and IL-7 in the offspring. Furthermore, the chemotaxis of B- and T-lymphocytes toward CCL21 and CXCL12 and the proliferative capacities of these lymphocytes were restored in the male offspring of diabetic mice administered CWP. Our data provide evidence of a protective role of CWP in decreasing the tendency of the offspring of diabetic mothers to develop diabetes and related complications.

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