

Immunomodulatory effects of yun zhi and danshen capsules in health subjects--a randomized, double-blind, placebo-controlled, crossover study.

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Immunostimulating polysaccharides extracted from the Chinese medicinal plant Yun Zhi (*Coriolus versicolor*) have been found to enhance various immunological functions, and Danshen (*Salvia miltiorrhiza*) to show beneficial effects on the circulatory system. In the present clinical study, we investigated if regular consumption of Yun Zhi and Danshen capsules could improve cellular immunity in healthy subjects. One hundred healthy subjects were recruited to take Yun Zhi (50 mg/kg body weight) plus Danshen (20 mg/kg body weight) or placebo capsules daily for four successive months and, after a 2-month wash-out period, crossover to take placebo or Yun Zhi plus Danshen capsules for four successive months. Flow cytometry was used to assess the lymphocyte subtypes and concentration of T helper (Th) cell cytokines in culture supernatant. Gene expression of cytokines and cytokine receptors of peripheral blood mononuclear cells (PBMC) was analyzed by cDNA expression array. Results showed that regular oral consumption of Yun Zhi-Danshen capsules could significantly elevate PBMC gene expression of interleukin (IL)-2 receptor, increase the percentage and absolute counts of T helper cell and ratio of CD4(+) (T helper)/CD8(+) (T suppressor and cytotoxic T) cell, and significantly enhance the *ex vivo* production of typical Th1 cytokine interferon-gamma from PBMC activated by phytohemagglutinin and lipopolysaccharide (all $p < 0.005$). Such consumption had no adverse effects on liver and renal functions, and the biochemical bone profile. Therefore, regular consumption of Yun Zhi and Danshen could be beneficial for immunological functions by potential enhancement of cell-mediated immunity in healthy subjects without any adverse effects.