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**Immunomodulatory activities of Yunzhi and Danshen in post-treatment breast cancer patients.**

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### **Abstract**

Breast cancer is the most common cancer among women worldwide. Discomfort and fatigue are usually arisen from anticancer therapy such as surgery, radiotherapy, chemotherapy, hormonal therapy, or combination therapy, because of the suppressed immunological functions. Yunzhi (*Coriolus versicolor*) can modulate various immunological functions in vitro, in vivo, and in human clinical trials. Danshen (*Salvia miltiorrhiza*) has been shown to benefit the circulatory system by its vasodilating and anti-dementia activity. The purpose of this clinical trial was to evaluate the immunomodulatory effects of Yunzhi-Danshen capsules in post-treatment breast cancer patients. Eighty-two patients with breast cancer were recruited to take Yunzhi [50 mg/kg body weight, 100% polysaccharopeptide (PSP)] and Danshen (20 mg/kg body weight) capsules every day for a total of 6 months. EDTA blood samples were collected every 2 months for the investigation of immunological functions. Flow cytometry was used to assess the percentages and absolute counts of human lymphocyte subsets in whole blood. Plasma level of soluble interleukin-2 receptor (sIL-2R) was measured by enzyme-linked immunosorbent assay (ELISA). Results showed that the absolute counts of T-helper lymphocytes (CD4+), the ratio of T-helper (CD4+)/T suppressor and cytotoxic lymphocytes (CD8+), and the percentage and the absolute counts of B-lymphocytes were significantly elevated in patients with breast cancer after taking Yunzhi-Danshen capsules, while plasma sIL-2R concentration was significantly decreased (all  $p < 0.05$ ). Therefore, the regular oral consumption of Yunzhi-Danshen capsules could be beneficial for promoting immunological function in post-treatment of breast cancer patients.

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雲芝和黨參的免疫調節功能應用於接受過治療後的乳腺癌病人  
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乳腺癌是全球女性患的癌症中最常見的類別。當病人經過手術、放射治療、化療、荷爾蒙治療或綜合治療後，往往會出現因免疫系統失調帶來之不適及疲倦的情況。

雲芝被多項試管/動物研究証實可調節免疫系統功能。而黨參亦被多項人類臨床研究証實能透過擴張血管及防止腦退化痴呆的問題去促進循環系統之健康。

是項臨床研究是給曾接受過治療的乳腺癌病人每天服用雲芝及黨參的混合膠囊達 6 個月，然後每 2 個月抽取病人的血液樣本作分析。方法是用不同的生物化學測試去量度血液中幾種免疫細胞的數量。這些細胞的數量是反映病人身體免疫功能健康的指標。

研究結果發現，接受過手術、放射治療、化療、荷爾蒙治療或綜合治療的乳腺癌病人在定時服用雲芝及黨參配方的情況下是能助提升免疫系統之功能。