Consumption of Purple sweet potato leaves modulates human immune response: T-lymphocyte functions, lytic activity of natural killer cell and antibody production

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Abstract

AIM: To study the immunological effects of physiological doses of purple sweet potato leaves (PSPL). METHODS: The randomized crossover study (two periods, each lasting for 2 wk) involved 16 healthy non-smoking adults of normal weight. The 6-wk study consisted of a run-in (wk 1) PSPL diet (daily consumption of 200 g PSPL) or a control diet (low polyphenols, with the amount of carotenoids adjusted to the same level as that of PSPL) (wk 2-3), washout diet (wk 4), and switched diet (wk 5-6). Fasting blood was collected weekly in the morning. T-lymphocyte function was assessed via the proliferation and secretion of immunoreactive cytokines. Salivary IgA secretion and the specific cytotoxic activities of cytotoxic T lymphocytes and natural killer (NK) cells were determined. RESULTS: The plasma beta-carotene level increased with time in both groups, while the plasma polyphenol level decreased in the control group, and no significant difference was detected between the two groups. Although plasma polyphenol levels did not significantly increase in the PSPL group at the end of the study, they were significantly elevated in urine. PSPL consumption produced a significant increase in proliferation responsiveness of peripheral blood mononuclear cells (PBMC) and their secretion of immunoreactive IL-2 and IL-4. As well, lytic activity in NK cells was elevated in a time-dependent fashion. Salivary IgA secretion significantly decreased in control group after 2 wk, and returned to baseline following dietary switch to PSPL. CONCLUSION: Consumption of PSPL modulates various immune functions including increased proliferation responsiveness of PBMC, secretion of cytokines IL-2 and IL-4, and the lytic activity of NK cells. The responsible determinants of PSPL remain to be elucidated, as does the biological significance of the present observations.