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Black tea (Camellia sinensis) decoction shows immunomodulatory properties on an experimental animal model and in human peripheral mononuclear cells

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ABSTRACT

Background Black tea (Camellia sinensis) has been used as a daily beverage for time immemorial. Immunomodulatory effects of tea are recognized as it stimulates the proliferation of cultured human peripheral blood mononuclear cells. Anti-inflammatory effects of tea have also been depicted in the available literature. Therefore, we designed this study to examine the potential immunemodulatory and anti-inflammatory activities of black tea in a rat model and in human peripheral mononuclear cells. Aims The purpose of the study was to determine (1) evaluation of anti-inflammatory effects of black tea on rats, (2) evaluation of immunemodulator effects of black tea on rats, and (3) evaluation of immunemodulator effects of black tea on human peripheral mononuclear cells. Materials and Methods Black tea decoction (10% and 20%) was prepared. Acute anti-inflammatory activity of tea decoction was evaluated using carrageenan and dextran whereas chronic anti-inflammatory (Immunomodulatory) effects were evaluated in a complete Freunds' adjuvant-induced arthritis model. Immunostimulatory role was evaluated in cultured human (in vitro) peripheral mononuclear cells (T-lymphocytes) by using methyl thioazolyl tetrazolium (MTT) and Trypan blue assay. Study Design An experimental study was designed. Results Black tea decoction (10% and 20%) strength has shown significant anti-inflammatory effects (64.8% and 77% reduction, respectively), on carrageenan-induced acute inflammatory models (rat paw edema) which can be comparable with the standard drug indomethacin (89.1%). In a chronic anti-inflammatory model, black tea decoction (10% and 20%) has shown significant suppressive effects on rat paw edema (38.56% and 69.53%) observed on 21st day. Lymphoproliferative action of tea was evaluated on human peripheral mononuclear cells using an MTT assay where the number of living cells were expressed in terms of optical density at 570 nm. An experiment has shown that black tea increases the maximum number of T-lymphocytes at 72 h with a maximum strength of 20%. Maximum number of viable cells (T-lymphocytes) was observed with black tea at 20% strength at 72 h. The results were expressed as mean +/- SD, and the significance was evaluated by Student's t-test versus control, with $P < 0.05$ implying significance. Conclusions Taken together, our data indicate that black tea has potential anti-inflammatory and immunomodulatory action and this corroborates with the current trend of tea being promoted as a 'health drink'.

KEYWORDS

Anti-inflammatory . black tea . immunomodulation

REFERENCES