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Oral administration of purple passion fruit peel extract attenuates blood pressure in female spontaneously hypertensive rats and humans

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Abstract

Hypertension is one of the most important modifiable risk factors for cardiovascular and cerebrovascular diseases. We investigated the potential antihypertensive effect of the purple passion fruit peel (PFP) extract, a mixture of bioflavonoids, phenolic acids, and anthocyanins, in spontaneously hypertensive rats and human. A high-performance liquid chromatography analysis was performed to identify the active ingredients of the PFP extract. In a rat liver toxicity assay, no hepatotoxicity was observed after 9 hours incubation in the presence of PFP extract (20 μg/mL). The PFP extract also revealed hepatoprotection against chloroform (1 mmol/L)-induced liver injury. In the experimental model, 24 spontaneously hypertensive rats were divided into 3 treatment groups for a period of 8weeks: control group and groups fed diet supplemented with either 10 or 50 mg/kg PFP extract. The diet supplemented with PFP extract at 50 mg/kg significantly lowered systolic blood pressure by 12.3mm Hg ($P < .01$) and markedly decreased serum nitric oxide level by 65% ($P < .05$) compared with the control group. The effect of the treatment on immune parameters was also evaluated, which showed no statistical changes. Studies were then extended to hypertensive human subjects who were administered PFP extract (400 mg/d) or placebo pills within a 4-week randomized, placebo-controlled, double-blind trial. The effects of the PFP extract were evaluated by blood pressure measurement. The systolic and diastolic blood pressure of the PFP extract-treated group decreased significantly by 30.9 ± 6.3 and 24.6 ± 3.3 mm Hg, respectively, compared with the placebo group ($P < .001$). No adverse effect was reported by the patients. The results suggest that the antihypertensive effect of the PFP extract may, in part, be mediated through nitric oxide modulation. It is suggested that the PFP extract may be offered as a safe alternative treatment to hypertensive patients.

Author keywords

Bioflavonoids; Human; Hypertension; Liver toxicity; Nitric oxide; Purple passion fruit; Rat

Indexed Keywords

EMTREE drug terms: anthocyanin; antihypertensive agent; bioflavonoid; cyanidin 3 glucoside; edulilic acid; isoquercitrin; nitric oxide; phenolic acid; placebo; purple passion fruit peel extract; unclassified drug

EMTREE medical terms: adult; animal experiment; animal model; animal tissue; antihypertensive activity; article; blood pressure regulation; clinical article; clinical trial; controlled clinical trial; controlled study; double blind procedure; drug effect; female; high performance liquid chromatography; human; hypertension; liver injury; liver protection; liver toxicity; male; nonhuman;