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Review

Antihypertensive effects of the flavonoid quercetin

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Abstract:
The blood pressure lowering effect of a fruit and vegetable-rich diet is a necessary dietary lifestyle measure now included the guidelines for the management of arterial hypertension. Furthermore, flavonoids represent a major class of plant polyphenolics. The present review addresses the antihypertensive effect of quercetin, one of the most abundant flavonoids present in fruits and vegetables, and probably the best studied flavonoid because of its high biological activity. Quercetin has been shown to induce a progressive, dose-dependent and sustained reduction in blood pressure when given chronically in several rat models of hypertension, including spontaneously hypertensive rats, L-NAME-treated rats, DOCA-salt hypertensive rats, two-kidney one-clip Goldblatt rats, rats with aortic constriction and Dahl salt-sensitive hypertensive rats. Quercetin was also effective in reducing blood pressure in rat models of metabolic syndrome, including the obese Zucker rats as well as rats treated with a high-sucrose, high-fat diet. Quercetin also prevented morphological and functional changes in the heart, vessels and kidney, while increasing production of reactive oxygen species associated with hypertension. A high dose of quercetin also reduced blood pressure in stage 1 hypertensive patients in a randomized, double-blind, placebo-controlled, crossover study. Since raised blood pressure is the major cause of stroke as well as an important risk factor for ischemic heart disease, we propose that the blood pressure-lowering effect of quercetin could be an important mechanism contributing to the reduced risk of myocardial infarction and stroke observed with fruit and vegetables-rich diets, and possibly with flavonoid-rich diets.

Key words: quercetin, hypertension, flavonoids, nitric oxide, oxidative stress