The in vitro inhibitory effects of crude extracts of traditional Chinese herbs on 3-hydroxy-3-methylglutaryl-coenzyme A reductase on vero cells

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Abstract

Cardiovascular disease is still the leading cause of death in Western countries. Epidemiological studies have shown that hypercholesterolemia is a major risk factor for coronary artery disease. Clinical trials of lipid lowering therapy with 3-hydroxy-3-methylglutaryl coenzyme A (HMG Co-A) reductase inhibitor have been shown to decrease coronary events and mortality. Flavonoids are polyphenolic natural antioxidants occurring in natural products such as traditional Chinese herbs, fruits and beverages such as tea and wine. The aim of this study was to evaluate the effects of crude extracts from traditional Chinese herbs on HMG Co-A reductase. The methods for analysis of specific inhibitors of mevalonate biosynthesis have been well-established by using Vero cells, a cell line obtained from kidneys of African green monkeys. Crude extracts from different traditional Chinese herbs were dissolved in 1% Dulbecco's modified Eagle's medium and incubated with Vero cells with or without the addition of 1 mM mevalonate or 5 mM sodium acetate for 24 hours in order to observe cell growth. Pravastatin, a specific HMG Co-A reductase inhibitor, was used as a positive control which inhibits Vero cells growth effectively and cell growth inhibition was reversible after 1 mM mevalonate. Among 100 traditional Chinese herbs used for the study, only two herbs: Curcuma zedoaria Roscoe and Poncirus trifoliata Raf. showed significant growth inhibition of Vero cells. This study shows that some crude extracts isolated from traditional medicinal herbs were effective HMG Co-A reductase inhibitors which might be developed into new hypocholesterolemic agents.