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Rajnibhai V. Patel
PharmInnova Award
Best M. Pharm Thesis

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Mr. Balaraju Pagilla

Research Guide

Dr. Sama Venkatesh

Subject:
Pharmacognosy

Thesis Title :
Bioenhancing effects of Naringin on Atorvastatin

College:
G Pulla Reddy College of Pharmacy, Mehdipatnam, Andhra Pradesh

Enhancing efficacy of Atorvastatin by combining with Naringin (Grapefruit)

Outcome of Research:

Atorvastatin (Lipitor) is a lipid loweing drug usually indicated for Dyslipidemia and related Cardiovascular Diseases. Naringin is a natural bioactive component of Citrus paradise (grapefruit), a natural bioenhancer and is reported to enhance the bioavailability of drugs. This research investigated the advantages of co-administration of a natural product (Naringin) with atorvastatin to hyperlipidemic rats. It was found that Naringin delayed the breakdown of atorvastatin, which resulted in higher concentrations of atorvastatin in the blood, which translated in reduction of dose requirement of atorvastatin. If this hypothesis can be proven in a clinical trial, the dose of atorvastatin can be reduced to see beneficial effects by co-administering with Naringin.

ABSTRACT

Naringin is a flavonone glycoside obtained from Citrus paradisi, a natural bioenhancer and reported to enhance the bioavailability of drugs by inhibiting cytochrome P450 and P-glycoprotein. In the present study, the effect of naringin was investigated on antihyperlipidemic properties of atorvastatin (AST) and the effects were supported with measurement of plasma concentrations. The results confirm that naringin significantly enhanced the antihyperlipidemic effects of atorvastatin in tyloxapol induced hyperlipidemic rats. The animals receiving AST along with naringin (15 and 30 mg/kg) produced increased percent protection when compared to animals receiving AST alone at dose levels of 25 and 50 mg/kg and it is found that the percent reduction in cholesterol and triglycerides is proportional to increase in plasma concentration of AST. Animals treated with 50 mg/kg of AST along with naringin at dose of 15 and 30 mg/kg showed a maximum reduction in total cholesterol with a percent protection of 32.63 and 41.45 whereas, triglycerides with a percent protection of 28.09 and 38.97, respectively at 2nd h when compared to 18.94 percent protection in total cholesterol and 17.14 percent protection in triglyceride levels in AST alone treated animals. From the results the co-administration of naringin (15 and 30 mg/kg) along with AST (25 and 50 mg/kg) increased the bioavailability of AST. Animals treated with 50 mg/kg of AST along with naringin at dose of 15 and 30 mg/kg showed maximum plasma concentration of AST by 793.03 and 1233.72 ng/ml, respectively, when compared to AST alone (50 mg/kg) treated animals plasma concentration is 198.92 ng/ml at 2nd h. These results suggest that naringin inhibits the biotransformation and metabolism of AST leading to higher levels of drug in systemic circulation and these results are concurrent with plasma concentration of AST. The plasma concentrations of naringin are increased with increase in dose of naringin and concentration is not significantly altered when co-administered with AST. The finding of present study confirmed that naringin could be used as bioenhancer when co administered with AST and the diet with naringin (Grapefruit) to the patients may potentiate the therapeutic efficacy of AST.