Dietary d-limonene alleviates insulin resistance and oxidative stress-induced liver injury in high-fat diet and L-NAME-treated rats.
Victor Antony Santiago J, Jayachitra J, Shenbagam M, Nalini N.

Source
Faculty of Science, Department of Biochemistry and Biotechnology, Annamalai University, Annamalainagar, Tamilnadu, 608002, India.

Abstract
BACKGROUND:
Nonalcoholic fatty liver disease (NAFLD) is one of the most common etiologies of chronic liver disease worldwide. The pathogenesis of metabolic syndrome associated with NAFLD is still under debate. AIM OF THE

SCOPE:
This study has investigated the hepatic biochemical and histological changes and also insulin resistance in metabolic syndrome associated with NAFLD.

METHODS:
Young male Wistar rats fed a high-fat diet (HFD 42.2% beef tallow) together with N (ω)-nitro-L-arginine methyl ester (L-NAME; 80 mg/L in drinking water) for 8 weeks and subsequently with 2% d-limonene for the final 4 weeks.

RESULTS:
HFD-fed rats treated with L-NAME showed increased systolic blood pressure, heart rate, fasting blood glucose, plasma insulin, hepatic marker enzymes, hepatic lipids, circulatory lipid peroxidation by-products, and hepatic phase I enzyme activities with decreased circulatory nonenzymic antioxidant concentrations and hepatic phase II enzyme activities. Dietary supplementation with d-limonene reversed the HFD and L-NAME-induced changes and restored pathological alteration of liver and pancreas.

CONCLUSIONS:
These data provide new insights into the therapeutic approach of d-limonene against the development of the metabolic syndrome associated with NAFLD.

PMID: 21445622