

Dietary medium chain triglycerides prevent nonalcoholic fatty liver disease

April 24 2013

Scientists at the Arkansas Children's Nutrition Center, a U.S. Department of Agriculture Agricultural Research Service Human Nutrition Research Center at the University of Arkansas for Medical Sciences, led by Dr. Martin Ronis have determined that dietary substitution of saturated fats enriched in medium chain triglycerides (MCT) for polyunsaturated fat prevents the development of nonalcoholic fatty liver disease (NAFLD). NAFLD occurs in patients with obesity and type II diabetes and is being seen at younger ages in association with the obesity epidemic. NAFLD is characterized by excessive accumulation of fat in the liver. In a proportion of NAFLD cases, liver pathology progresses to hepatitis, fibrosis and liver cancer.

The findings which appear in the February 2013 issue of *Experimental Biology and Medicine* used a laboratory animal model of NAFLD to demonstrate that isocaloric substitution of a mixture of MCT rich saturated fats for of dietary [polyunsaturated fats](#) prevented liver fat accumulation. In addition progression of injury was blocked as a result of reduced susceptibility of lipids to radical attack and increased basal metabolic rate produced by activation of PPAR signaling.

"There is a real shortage of potential therapies for NAFLD short of weight loss and increased exercise" states Dr. Ronis. "In this study, we show that even if total dietary fat content remains high and excess calories continue to be consumed, the metabolic effects of MCT to change liver [lipid profiles](#) and increase respiration can prevent the development of liver pathology". Although complete substitution of

MCT oil for vegetable oils in cooking is not feasible as a result of its low smoking point, the studies demonstrated that the protective effects of MCT were dose-dependent.

Dr. Ronis states that "Future studies will be designed to determine if MCT rich diets can reverse NAFLD and [nonalcoholic steatohepatitis](#) in disease models, and if successful, clinical trials may be initiated in patients with metabolic syndrome." Dr. Ronis states that "the technology to produce synthetic cooking oils incorporating MCT is already with us. The Japanese are currently testing an oil containing monounsaturated 18:1 fatty acids and MCT for beneficial health effects. There is no reason why similar synthetic products incorporating saturated fatty acids such as 16:0 or 18:0 and MCT cannot be developed for the US market".

Dr. Steven R. Goodman, Editor-in-Chief of *Experimental Biology and Medicine*, said "with obesity and type II diabetes on the rise development of nonalcoholic [fatty liver disease](#) (NAFLD) that can lead to hepatitis, fibrosis and liver cancer is an increasing problem. Dr. Martin Ronis and colleagues using an animal model of NAFLD have shown that substitution of [saturated fat](#) in the form of medium chain triglycerides (MCT) for polyunsaturated fats can prevent the progression of NAFLD-associated liver injury. As pointed out by Ronis and colleagues this provides a potential future therapy for NAFLD where we simply alter our cooking oils to contain therapeutic levels of MCTs."

Provided by Society for Experimental Biology and Medicine

Citation: Dietary medium chain triglycerides prevent nonalcoholic fatty liver disease (2013, April 24) retrieved 15 July 2023 from <https://medicalxpress.com/news/2013-04-dietary-medium-chain-triglycerides-nonalcoholic.html>

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