

Abstract

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Effects of weight loss on liver and erythrocyte polyunsaturated fatty acid pattern and oxidative stress status in obese patients with non-alcoholic fatty liver disease.

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OBJECTIVE: Our aim was to study the influence of weight loss on the fatty acid (FA) composition of liver and erythrocyte phospholipids and oxidative stress status in obese, non-alcoholic, fatty liver disease (NAFLD) patients.

METHODS: Seven obese NAFLD patients who underwent subtotal gastrectomy with a gastro-jejunal anastomosis in roux and Y were studied immediately and 3 months after surgery. Seven non-obese patients who underwent anti-reflux surgery constituted the control group. Serum F2-isoprostane levels were measured by GS/NICI-MS/MS and FA composition was determined by GC.

RESULTS: At the time of surgery, controls and obese patients exhibited a hepatic polyunsaturated fatty acid (PUFA) pattern that correlated with that of erythrocytes. Three months after surgery, NAFLD patients lost 21% of initial body weight; serum F2-isoprostane levels decreased by 76%; total PUFA, long-chain PUFA (LCPUFA), n-3 PUFA, and n-3 LCPUFA increased by 22, 29, 81, and 93%, respectively; n-6/n-3 LCPUFA ratio decreased by 51%; docosahexaenoic acid/docosapentaenoic acid ratio increased by 19-fold; and the n-3 product/precursor ratio (20: 5 + 22: 5 + 22: 6)/18: 3 increased by 164% ($p < 0.05$).

CONCLUSIONS: It is concluded that weight loss improves the n-3 LCPUFA status of obese patients in association with significant amelioration in the biomarkers of oxidative stress, membrane FA insaturation, and n-3 LCPUFA biosynthesis capacity, thus representing a central therapeutic issue in the improvement of obesity-related metabolic alterations involved in the mechanism of hepatic steatosis.

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