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Abstract

Effect of a Short Time Supplementation of Polyunsaturated Fatty Acids on Lipid Metabolism

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Abstract

Background and Aim: Dietary fats play a crucial role in altering serum lipid levels, potentially leading to dyslipidemia—a metabolic disorder associated with various risk factors for cardiovascular diseases. The objective of this study is to examine the impact of short-term supplementation with polyunsaturated fatty acids (PUFAs) on lipid metabolism.

Method: In line with the protocol, 126 female BALB/c mice were categorized into 7 groups, comprising 6 experimental groups and a control group, each consisting of 18 mice. The experimental groups received either fish oil (FO), rich in n-3 PUFA, or corn oil (CO), rich in n-6 PUFA, via oral gavage for 15 consecutive days at doses of 0.6%, 1%, and 1.5% Volume/Weight (V/W). Under identical experimental conditions, the control group received a 1/10 solution of PBS at a single dose of 0.6% V/W. Throughout the experiment, body weight was measured weekly. At the experiment's conclusion, all groups of mice were sacrificed, and serum lipid profiles were assessed by measuring triglycerides, total cholesterol, LDL-cholesterol, and HDL-cholesterol. Additionally, a liver histological study was conducted.

Results: The results indicated that the body weight of experimental mice (fish oil and corn oil groups) remained unaffected by PUFA consumption. However, triglyceride, total cholesterol, LDL-cholesterol, and HDL-cholesterol levels exhibited a significant decrease. Histological analysis revealed isolated instances of hepatic lesions in the experimental groups compared to the control group.

Conclusion: The findings suggest that the hypolipidemic effects of both n-3 and n-6 PUFAs make them compelling dietary supplements for the prevention or management of dyslipidemia and related diseases.

Keywords: n-3 PUFA, n-6 PUFA, Lipid metabolism, Dyslipidemia

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