Effects of Estradiol on Lipid Composition of Liver, Skeletal Muscle and Adipose Tissue from Ovariectomized Rats.

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Several lines of evidence indicate that estrogens are important regulators of lipid metabolism. We studied the effect of 17-β-estradiol treatment in ovariectomized rats on lipid composition of liver, skeletal muscle and adipose tissue. Ovariectomized rats were separated randomly into two groups: control (V) and treated with physiological doses of 17-β-estradiol (E). Rats from E group received doses of 17-β-estradiol mimicking its plasma levels in pregnant rats. Lipid classes and fatty acid composition of liver, muscle and adipose tissue were assessed at three stages (days 6, 11 and 16) of the treatment period. The results showed that estradiol greatly affected the levels of the various lipid fractions. The liver triglyceride content, an index of long term hepatic lipid production, was reduced in the E group compared to the ovariectomized group (V). Also, estradiol increased the level of cholesterol in muscle, although its levels in liver and adipose tissue did not undergo significant variations. In addition, estradiol had important effects on fatty acid distribution of assessed tissues. E group exhibited increased the levels of docosahexaenoic acid (DHA) in phospholipids of liver respect to V group, but the fatty acid composition of phospholipids in muscle were relatively insensitive to estrogenic influences. Conversely, estradiol treatment produced no significant changes in the concentration of individual fatty acids incorporated into liver and adipose tissue triglycerides. These findings suggest that estradiol has important effects on lipid classes and fatty acid composition, affecting the body lipid profile. Specifically, estradiol modifies, in a time-dependent manner, liver DHA content, possibly by alteration of the expression of desaturase enzymes involved in the de novo synthesis of this fatty acid.

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