Nathaniel W. Revis and A. J. V. Cameron, “Metabolism of Lipids in Experimental Hypertrophic Hearts of Rabbits”, Metabolism, Volume 28, Issue 6, Pages 601-613, 1979

Metabolism of Lipids in Experimental Hypertrophic Hearts of Rabbits

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Received 12 June 1978
Available online 10 May 2004

Abstract

Cardiac hypertrophy was induced in rabbits by subcutaneous injection of thyroxine or isoprenaline or by surgically constricting the abdominal aorta. Alterations in lipid metabolism were observed in these hypertrophic hearts. Thyroxine or isoprenaline treatment increased the fatty acids in the serum and stimulated a marked increase in total lipids, triglycerides, and fatty acids in the hypertrophied myocardium. Coarctation of the aorta, in contrast, induced a significant increase in these lipids without significantly affecting serum free fatty acids. Histochemical and morphological studies confirmed an increase in neutral lipids. It is suggested that the observed increase in fatty acids in the heart following thyroxine or isoprenaline treatment is related to the increase in serum free fatty acids, which is followed by an increase in the removal of serum fatty acids by the heart. However, the amount of serum fatty acids that is removed exceeds the amount that is oxidized, which leads to an increase in lipid stores. The increase in lipid stores in the heart following coarctation of the aorta probably corresponds to the decrease in myocardial concentrations of carnitine. Serum lipid levels following coarctation were not significantly different from those of controls.

Supported by the Division of Biomedical and Environmental Research, U.S. Department of Energy under contract W-74005-eng-26 with the Union Carbide Corporation.

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