Clin Chim Acta. 1986 May 15;156(3):299-313.

Changes in fatty acid profiles of plasma, erythrocytes and polymorphonuclear leukocytes in induced hypothyroidism in man: indirect evidence for altered delta 6 desaturase activity.

van Doormaal JJ, Muskiet FA, Martini IA, Doorenbos H.

Abstract

Thirteen patients who were athyreotic as a consequence of ablation treatment for well-differentiated thyroid cancer were studied during triiodothyronine supplementation, and subsequently at the end of a two weeks withdrawal of this medication. Serum and plasma lipid concentrations, erythrocyte cholesterol content and plasma and erythrocyte total fatty acid patterns were measured. In addition, total fatty acid profiles of polymorphonuclear leukocytes of eight patients and scanning electron microscopic studies of erythrocytes of nine patients were made. We observed an increase of the serum concentrations of total and unesterified cholesterol and phospholipids in all patients. Except for two, all patients showed an increase in the serum triglyceride concentration. The relative amounts of 18:2c,omega 6 rose and those of 20:3c,omega 6 fell in all studied compartments. In addition, the relative amounts of all other omega 6 fatty acids, 22:6c,omega 3, 20:3c,omega 9, 16:0, 18:0, and total saturated fatty acids decreased in plasma, whereas the levels of all monounsaturated fatty acids increased in the erythrocytes. The level of 20:3c,omega 9 rose in the erythrocytes and the 20:3c,omega 9/20:4c,omega 6 ratio rose in the polymorphonuclear leukocytes. The erythrocyte total fatty acids and cholesterol content and their ratio did not change, nor was any alteration seen in the red cell morphology by scanning electron microscopy. This study reveals that the induction of hypothyroidism in man changes fatty acid patterns of plasma, erythrocytes and polymorphonuclear leukocytes. The nature of these alterations suggests especially a disturbance in the delta 6 desaturase activity. The data point to the possibility of a derangement of eicosanoid synthesis in hypothyroidism.

PMID: 3521951 [PubMed - indexed for MEDLINE]