Liver Damage, Carbon Tetrachloride, Lipoprotein Secretion

Changes of lipoprotein secretion and composition in response to CCl4 treatment were studied in monolayer cultures of rat primary hepatocytes.

(1) CCl4 decreased secretion of very low density lipoproteins (VLDL) by about 85%, while high density lipoprotein (HDL) secretion was less affected (about 40%). The effect was concentration-dependent. (2) CCl4 significantly inhibited secretion of VLDL- and HDL-associated triglycerides and cholesterol esters. VLDL- and HDL-associated cholesterol was not affected, while secretion of phospholipids was increased. (3) Hepatocytes secreted the apolipoproteins B48, B100, E, C, and A-I. CCl4 reduced secretion of apoproteins associated with VLDL by almost 20%, and by about 75% when associated with HDL. The de novo synthesis of apolipoproteins was attenuated by CCl4. (4) CCl4 caused variations in the apolipoprotein composition in VLDL and HDL.

CCl4 intoxication of the liver affected the morphology and/or function of the lipoproteins, which drastically impaired their ability to act as transport vehicles for lipids from the liver to the circulation.