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Fractional esterification rate of cholesterol in high density lipoprotein (HDL) can predict the particle size of low density lipoprotein and HDL in patients with coronary heart disease.

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Abstract

Fractional esterification rate of cholesterol in high density lipoprotein (HDL) (FER[HDL]) can predict the size distribution and physicochemical characteristics of HDL in plasma. In the present study, we investigated the correlation of FER(HDL) with the particle size of low density lipoprotein (LDL) (LDL-size) in 111 patients (81 males and 30 females) with coronary heart disease (CHD). The correlations of FER(HDL) and LDL-size with conventional lipid and lipoprotein parameters were also studied. FER(HDL) was closely associated with LDL-size (males: $r = -0.618$, females: $r = -0.629$, $P < 0.001$). Plasma levels of TG, HDL-cholesterol (HDL-C), HDL2-cholesterol (HDL2-C) and apo B were also associated with LDL-size in male CHD patients ($r = -0.534$, 0.314, 0.358, and -0.482, $P < 0.01$ or 0.001), while plasma levels of TG and apo B were associated with LDL-size in female patients ($r = -0.350$ and -0.348, $P < 0.05$). In a stepwise multiple regression analysis, FER(HDL) alone accounted for 38 and 40% of the variability in LDL-size in male and female CHD patients, respectively. Other parameters accounted for an additional 6-10%. With respect to the relation between FER(HDL) and HDL subfractions, FER(HDL) related only to HDL2-C (males: $r = -0.640$, females: $r = -0.652$, $P < 0.001$). This result suggests that FER(HDL) is better able to predict the presence (or absence) of large HDL, rather than that of small HDL. All these data taken together, suggest that FER(HDL) is a useful tool to predict the particle size of both LDL and HDL, even in CHD patients.