

Comparison of children and coronary heart disease patients with low high density lipoprotein cholesterol levels

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Abstract

Low plasma high density lipoprotein cholesterol (HDL-C) is a major risk factor for coronary heart disease (CHD) in adults. In the field of pediatrics, subjects with low plasma HDL-C are often found among obese or dyslipidemic children. However, it is not clear whether low HDL-C in children should be considered a risk factor for CHD. The purpose of this study was to evaluate the risk for CHD in children with low HDL-C by comparing their lipid and apolipoprotein levels and physicochemical characteristics of their HDL with those of age-matched children with normal HDL-C and CHD patients with low HDL-C. Plasma lipids and apolipoproteins were measured in 206 dyslipidemic children (dyslipidemic), 65 obese children (obese), 93 CHD patients with low HDL-C (<40 mg/dl) and 128 children with normal HDL-C (controls). To evaluate the physicochemical characteristics of HDL, molar and fractional esterification rates of cholesterol in plasma (MER_{plasma} and FER_{plasma}) and HDL (MER_{HDL} and FER_{HDL}) were determined in 128 children with normal HDL-C, 71 dyslipidemic, 33 obese and 93 CHD who allowed second blood samples to be taken. Compared to controls, children with low HDL-C showed atherogenic profiles of lipid and apolipoprotein levels and physicochemical characteristics of HDL (lower apo A-I, lower ratio of apo A-I to apo B and higher FER_{HDL}). Therefore, the differences in lipid and apolipoprotein profiles between children with low HDL-C and CHD patients with low HDL-C were examined next. The two groups of subjects based on the HDL-C level (Group I: <30 mg/dl, Group II $30 \leq \text{HDL-C} < 40$ mg/dl) were studied. Compared to CHD, Group I children showed less atherogenic apolipoprotein profiles (lower apo B and higher ratio of apo A-I to apo B). Similar findings were also found in Group II children, but the differences were less prominent than those in Group I children. FER_{HDL} in children with low HDL-C were similar to those in CHD. These findings suggest that the physicochemical characteristics of HDL in children with low HDL-C are similar to those in CHD, but the abnormalities of apo B-containing lipoproteins are milder than those in CHD patients. Thus, if further changes in the nature of apo B-containing lipoproteins could be prevented, children with low HDL-C might not become high risk for CHD in later life.

Ohta, T., Saku, K., Nakamura, R., Maung, K.K. and Matsuda, I., 1998. Comparison of children and coronary heart disease patients with low high density lipoprotein cholesterol levels. *Atherosclerosis*, 137(2), pp.321-328.