

# Abstract

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## **A large high-density lipoprotein enriched in apolipoprotein C-I: a novel biochemical marker in infants of lower birth weight and younger gestational age.**

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**CONTEXT:** Low birth weight is associated with increased cardiovascular disease in adulthood, and differences in the molecular weight, composition, and quantity of lipoprotein subclasses are associated with coronary artery disease.

**OBJECTIVE:** To determine if there are novel patterns of lipoprotein heterogeneity in low-birth-weight infants.

**DESIGN, SETTING, AND PARTICIPANTS:** Prospective study at a US medical center of a representative sample of infants ( $n = 163$ ; 70 white and 93 black) born at 28 or more weeks of gestational age between January 3, 2000, and September 27, 2000. This sample constituted 20% of all infants born during the study period at this site.

**MAIN OUTCOME MEASURES:** Plasma levels and particle sizes of lipoprotein subclasses and plasma concentrations of lipids, lipoproteins (high-density lipoprotein [HDL] and low-density lipoprotein [LDL]), and apolipoproteins.

**RESULTS:** An elevated lipoprotein peak of a particle with density between 1.062 and 1.072 g/mL was identified using physical-chemical methods. This subclass of large HDL was enriched in apolipoprotein C-I (apo C-I). Based on the amount of the apo C-I-enriched HDL peak, 156 infants were assigned to 1 of 4 groups: 0 (none detected), 17%; 1 (possibly present), 41%; 2 (probably present), 22%; 3 (elevated), 19%. Infants in group 3, compared with those in the other 3 groups, had significantly ( $P < .001$ ) lower mean birth weight (2683.7 vs 3307.1 g) and younger mean gestational age (36.2 vs 39.3 wk). After correction for age, infants in group 3 had significantly higher levels of total and large HDL cholesterol and of total and large LDL cholesterol and LDL particle number. However, infants in group 3 had lower levels of small HDL, very low-density lipoproteins, and triglycerides than infants in the other 3 groups. This lipoprotein profile differed from that in infants born small for gestational age, who had significantly higher triglyceride ( $P < .001$ ) and apo B ( $P = .04$ ) levels, but lower levels of total and large HDL cholesterol ( $P < .001$ ) and apo A-I ( $P < .001$ ).

**CONCLUSIONS:** Because apo C-I-enriched HDL, and purified apo C-I alone, promotes apoptosis *in vitro*, increased amounts of this particle may have physiological significance and identify a novel group of low-birth-weight infants apparently distinct from traditionally classified small-for-gestational-age infants.

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