

# Abstract

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## Lipoprotein(a)-cholesterol and coronary heart disease in the Framingham Heart Study.

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**BACKGROUND:** Increased plasma lipoprotein(a) [Lp(a)] concentrations have been reported to be an independent risk factor for coronary heart disease (CHD) in some prospective studies, but not in others. These inconsistencies may relate to a lack of standardization and the failure of some immunoassays to measure all apolipoprotein(a) isoforms equally.

**METHODS:** We measured plasma Lp(a)-cholesterol [Lp(a)-C] in a Caucasian population of offspring and spouses of the Framingham Heart Study participants, using a lectin-based assay (LipoproTM). We compared the prevalence of increased Lp(a)-C to the presence of sinking pre-beta-lipoprotein (SPB). We also related Lp(a)-C concentrations to the prevalence of CHD risk in the entire population.

**RESULTS:** The mean ( $\pm$  SD) Lp(a)-C concentration in the Framingham population ( $n = 3121$ ) was  $0.186 \pm 0.160$  mmol/L, with no significant gender or age differences. The mean Lp(a)-C concentrations in the absence or presence of SPB were  $0.158 \pm 0.132$  mmol/L and  $0.453 \pm 0.220$  mmol/L, respectively ( $P < 0.0001$ ). The mean Lp(a)-C concentration in men with CHD ( $n = 156$ ) was  $0.241 \pm 0.204$  mmol/L, which was significantly ( $P < 0.001$ ) higher, by 34%, than in controls. The odds ratio for CHD risk in men with Lp(a)-C  $\geq 0.259$  mmol/L ( $\geq 10$  mg/dL), after adjusting for age, HDL-cholesterol, LDL-cholesterol, smoking, diabetes, blood pressure, and body mass index, was 2.293 (confidence interval, 1.55-3.94;  $P < 0.0005$ ). Lp(a)-C values correlated highly with a Lp(a)-mass immunoassay [ApotekTM Lp(a);  $r = 0.832$ ;  $P < 0.0001$ ;  $n = 1000$ ].

**CONCLUSIONS:** An increased Lp(a)-C value  $\geq 0.259$  mmol/L ( $\geq 10$  mg/dL) is an independent CHD risk factor in men with a relative risk of more than 2, but was inconclusive in women. Lp(a)-C measurements offer an alternative to Lp(a)-mass immunoassays and can be performed on automated analyzers.

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