

Abstract

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Small dense LDL particles and metabolic syndrome in a sample of middle-aged women. Findings from Progetto Atena.

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OBJECTIVE: Metabolic Syndrome (MS) is highly prevalent in the general population. Recently, small dense LDL (sd-LDL) particles have been considered a risk marker in MS diagnosis.

METHODS: We analyzed cross-sectionally the association between sd-LDL and MS in a population-based sample of 210 middle-aged southern Italian women; among them 86 participants had MS (prevalence 40.9%). LDL particle separation was performed by Lipoprint System: seven LDL subfractions were obtained and LDL score (% of sd-LDL particles) calculated.

RESULTS: Women with the MS diagnosis had significantly higher LDL score as compared to participants without MS diagnosis (median 0 vs. 3.6, $p < 0.001$ by Mann Whitney). The univariate analysis showed a positive and significant association between MS diagnosis (OR 4.80; 95% CI 2.29-10.18; $p < 0.001$ for MS diagnosis) and some MS components Triglycerides (TG), HDL Cholesterol (HDL-C), (OR 14.82; 95% CI 5.24-41.88; $p < 0.001$ for Ln TG); (OR 0.92; 95% CI 0.89-0.95; $p < 0.001$ for HDL-C) and LDL score. Apo B and insulin levels were also positively related to the presence of sd-LDL (OR 31.56; 95% CI 5.58-178.29; $p < 0.001$ for apo B); (OR 1.07; 95% CI 1.00-1.15; $p < 0.05$ for insulin). After controlling for age, insulin and apo B, MS diagnosis (OR 4.0; 95% CI 1.76-9.09; $p < 0.001$ for MS diagnosis) and MS components (TG, HDL-C) (OR 4.41; 95% CI 1.22-15.87; $p = 0.023$ for Ln TG); (OR 0.94; 95% CI 0.89-0.98; $p = 0.009$ for HDL-C) remained significantly associated with high LDL score (upper quintile).

CONCLUSION: Our results suggest that sd-LDL particles could be a valuable marker for diagnosis and severity of the MS. Future prospective epidemiological studies are envisaged to explore the specific contribution of this marker on cardiovascular risk. LDL size measurement could be an useful tool for identifying a subsample patients with prominent lipoprotein abnormality, within the large population with the MS diagnosis, and who are candidates for intensive lipid-lowering interventions.

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