

Hepatic steatosis, carotid atherosclerosis and metabolic syndrome: the STEATO Study

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Abstract

Purpose Hepatic steatosis is frequently observed in subjects with metabolic syndrome (MS). In type 2 diabetics, it is independently associated with cardiovascular diseases. In order to confirm and extend this finding, a large group of patients with risk factors for atherosclerosis was studied.

Methods Carotid atherosclerosis was investigated by echo-Doppler, and hepatic steatosis by ultrasound and transaminase values. Strict exclusion criteria were chosen

in order to avoid secondary forms of fatty liver and interference on transaminase values.

Results Among 970 enrolled patients, about 20% were diabetics, half had MS and 76% presented echographic hepatic steatosis. In multivariate analyses, fatty liver and MS were associated with carotid atherosclerosis [odds ratio (95% confidence intervals) 2.15 (1.27–3.63) and 1.72 (1.12–2.64), respectively], whereas HOMA index was not. Aspartate aminotransferase and alanine aminotransferase were not independently associated with carotid atherosclerosis, whereas gamma-glutamyl transferase showed a link with atherosclerosis beyond MS and steatosis presence. The analyses of the 780 non diabetics recruited showed similar results.

Conclusions The results of the present study demonstrate that hepatic steatosis measured by echography is associated with carotid atherosclerosis in a large population mostly carrying cardiovascular or metabolic risk factors, independently of MS, cardiovascular diseases, diabetes mellitus and/or insulin resistance.

C. Carallo and G. Mancuso have contributed equally to the manuscript.

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Keywords Fatty liver · Metabolic liver disease · Carotid artery disease · Carotid plaques · Echo-Doppler

Abbreviations

NAFLD	Non-alcoholic fatty liver disease
NASH	Non-alcoholic steatohepatitis
MS	Metabolic syndrome
BMI	Body mass index
AST	Aspartate aminotransferase
ALT	Alanine aminotransferase
γGT	Gamma-glutamyl transferase
HOMA	Homeostatic model assessment
LDL	Low density lipoprotein
HDL	High density lipoprotein