

Diagnostic performance of the GGTP/HDL-C ratio for NAFLD in adults with obesity candidates for bariatric surgery



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BACKGROUND

Nonalcoholic fatty liver disease (NAFLD) has become the most common liver disease and is related to metabolic risk factors such as obesity, insulin resistance, dyslipidemia, diabetes mellitus and metabolic syndrome. Gamma-glutamyl transpeptidase (GGTP) and high density lipoprotein cholesterol (HDL-C) have shown a correlation with the degree of steatosis and metabolic syndrome respectively. The objective of this study was to evaluate the diagnostic performance of the GGTP/HDL-C ratio for NAFLD in adults with obesity who are candidates for bariatric surgery.

METHODOLOGY

Analytical cross-sectional study with diagnostic test evaluation, in which a secondary database of 249 adults with obesity was analyzed. The diagnosis of NAFLD was based on liver biopsy, the most appropriate cut-off point was determined by three methods and five adjustment models were builded in the global population and stratified by sex.

RESULTS

Participants with NAFLD showed elevated values of glucose, GGTP, GGTP/HDL-C ratio, insulin, and HOMA-IR, but lower HDL-C. In the global group of the last adjusted model with high GGTP/HDL-C ratio, the prevalence of NAFLD was 14% (PR: 1.14, 95%CI: 1.04-1.33) higher, while in women with this altered parameter the prevalence was 19% (PR: 1.19, 95%CI: 1.07-1.42) higher than those with normal values. The optimal cutoff value was 20.5 U/mmol and the area under the curve (AUC) of the ratio was 0.81 (95%CI: 0.64-0.98), sensitivity and specificity were 82% and 77.8% respectively.

DISCUSSION

Previous studies have shown that GGTP and HDL-C are good markers of hepatic steatosis and insulin resistance, respectively (1,2). GGTP has been reported to be a better predictor of NAFLD in patients with Metabolic Syndrome (3). We only found one study that evaluated the diagnostic performance of the GGTP / HDL-C ratio for the presence of NAFLD (4). This confirms the close relationship that exists between hepatic steatosis and associated metabolic conditions, which has led to the proposal of a change in the nomenclature and definition of NAFLD for the term metabolism-associated fatty liver disease (MAFLD) (5).

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Table 3. Association between elevated GGTP/HDL-C ratio and NAFLD stratified by sex.

GGTP/HDL ratio	Model 1*		Model 2**		Model 3†		Model 4††		Model 5‡	
	PR	95%CI	PR	95%CI	PR	95%CI	PR	95%CI	PR	95%CI
All people										
Normal		Ref.		Ref.		Ref.		Ref.		Ref.
High	1.15	1.05-1.33	1.16	1.07-1.34	1.15	1.06-1.32	1.15	1.05-1.32	1.14	1.04-1.33
Male										
Normal		Ref.		Ref.		Ref.		Ref.		Ref.
High	0.96	0.85-0.99	0.97	0.85-1.01	0.96	0.82-0.99	0.96	0.82-1.01	0.97	0.84-1.01
Female										
Normal		Ref.		Ref.		Ref.		Ref.		Ref.
High	1.22	1.08-1.46	1.22	1.09-1.48	1.20	1.08-1.44	1.21	1.08-1.46	1.19	1.07-1.42

‡Estimation of confidence intervals using non-parametric bootstrap with bias-corrected and accelerated with 1000 replications for generalized linear models of the Poisson link log family with robust standard errors.
*Adjusted for sex, age, physical activity, smoking, high blood pressure and abdominal girth.
**Model 1 plus triglycerides, LDL-C, excluding abdominal girth.
†Model 2 plus TGO/TGP ratio and FA
††Model 3 plus UA/Cr ratio
‡Model 4 plus insulin resistance
PR: Prevalence ratio. 95%CI: 95% Confidence Intervals.

CONCLUSION

The analysis of the results suggests that the GGTP/HDL-C ratio is a useful biomarker for the diagnosis of NAFLD in adult population with obesity.