Hepatic Steatosis Index (HSI): A Valuable Biomarker in Subjects with Metabolic Dysfunction-associated Fatty Liver Disease (MAFLD)

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Introduction and Objectives: Metabolic Dysfunction-associated Fatty Liver Disease (MAFLD) has been recognized as the hepatic component of metabolic syndrome and has become a growing public health concern. Early and accurate detection of MAFLD is crucial for implementing appropriate intervention strategies and preventing progression to serious complications such as liver cirrhosis. We aimed to describe the diagnostic performance of the Hepatic Steatosis Index (HSI) in subjects with MAFLD and compare it with the Homeostatic Model Assessment of Insulin Resistance (HOMA), Waist-to-Hip Ratio (WHR), and Visceral Fat (SECA).

Materials and Methods: Retrospective design study. Bioanthropometric, clinical, and biochemical variables were collected. The HSI was calculated using the formula HSI = 8 * ALT/AST + BMI + 2 (if diabetic) + 2 (if female). ROC curves and their areas were generated. Statistical significance was determined at $p < 0.05$.

Results: A total of 585 subjects were evaluated, of whom 279 were classified with MAFLD (65.5% females) and 306 without MAFLD (76.8% females). Subjects with MAFLD exhibited higher values of age, BMI, WHR, HOMA, CAP, and HSI (Table 1). The HSI showed a diagnostic performance with an area under the curve (AUC) of 0.80. A cutoff point of 39.9 was established for the HSI, with a sensitivity of 63%, specificity of 74%, positive predictive value (PPV) of 73%, and negative predictive value (NPV) of 64%. The HSI demonstrated superior diagnostic performance compared to visceral fat (0.70), HOMA (0.70), and WHR (0.66) (Fig 1).

Conclusions: The results of this study demonstrate that HOMA, visceral fat, and ICC can be useful as screening strategies in MAFLD. However, the Hepatic Steatosis Index (HSI) showed superior diagnostic performance compared to the other evaluated biomarkers. Therefore, it is suggested that HSI be considered a useful diagnostic tool in MAFLD.

Ethical statement

The protocol was registered and approved by the Ethics Committee. The identity of the patients is protected. Consentment was obtained.

Declaration of interests

None

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Table 1
Comparison of variables in subjects with MAFLD and without MAFLD. Numerical variables are expressed as medians and interquartile ranges, and categorical variables with frequency and percentage. Student's t-test or Wilcoxon test was used for the difference of means as appropriate. Categorical variables were compared using Chi-square test. HOMA, Homeostasis Model Assessment of Insulin Resistance; WHR, Waist-Hip Ratio Index; MAFLD, Metabolic Associated Fatty Liver Disease.

Variable	MAFLD (n=279)	Non MAFLD n=306	P-value
AGE	51 (41.7-59)	47 (35-57)	<.0001
Gender			.002
-Male	96 (34.5%)	71 (23.2%)	
-Female	183 (65.5%)	235 (76.8%)	
BMI	31.8 (28.9-35.3)	26.2 (23.9-30.6)	<.0001
Visceral Fat (SECA)	3.4 (2.7-4.5)	2.5 (2-3.2)	<.0001
WHR	.93 (.86-.98)	.86 (.81-.92)	<.0001
Glucose	94 (86-105)	89 (83-95)	<.0001
Insuline	8 (5.9-11.6)	6.3 (4.5-8.9)	<.0001
HOMA	1.8 (1.3-2.9)	1.3 (.94-1.9)	<.0001
Hepatic steatosis index	42.9 (39.6-47.9)	38 (33.8-42)	<.0001

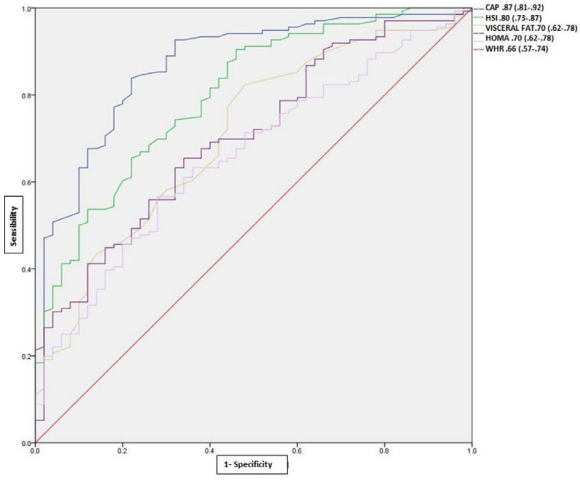

Figure 1. Diagnostic performance of non-invasive biomarkers in subjects with Metabolic Dysfunction-Associated Fatty Liver Disease (MAFLD). Receiver Operating Characteristic (ROC) curves were plotted, and the area under the curve was calculated. The Youden index was used to select the optimal cutoff point. CAP, Controlled Attenuation Parameter; HSI, Hepatic Steatosis Index; HOMA, Homeostatic Model Assessment of Insulin Resistance; ICC.- Waist-to-Hip Ratio.

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Secondary Attack Rate of Hepatitis C Virus (HCV)

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