Study on the degree of liver fibrosis by FIB-4 index and ARFI technique in patients with non-alcoholic fatty liver disease and non-diabetes

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Background

Non-alcoholic fatty liver disease (NAFLD) is a growing cause of liver fibrosis, even in non-diabetic populations. Non-invasive methods such as the Fibrosis-4 (FIB-4) index and Acoustic Radiation Force Impulse (ARFI) elastography are increasingly utilized, yet data in non-diabetic patients remain limited.

Objective

To evaluate the FIB-4 index and shear wave velocity (SWV) measured by the ARFI technique in non-diabetic patients with NAFLD. Additionally, to investigate factors related to liver fibrosis severity in these patients

Materials and methods

A cross-sectional descriptive study was conducted on 107 patients diagnosed with NAFLD and without diabetes at Tam Anh General Hospital, Viet Nam, between January 2023 and October 2024. The FIB-4 index was calculated using a standardized formula. Liver stiffness was measured by ARFI-based shear wave velocity (SWV). Correlation analyses, ROC curves, and multivariate logistic regression were applied to determine associations with significant (F≥2) and advanced fibrosis (F≥3).

Results

Among the 107 patients, mean age was 47.3 ± 12.6 years, and 56.1% were male. Mean FIB-4 was 1.46 ± 1.82, mean SWV was 1.29 ± 0.44 m/s. The prevalence of fibrosis stage F≥2 and F≥3 was 15.0% and 11.3%, respectively. FIB-4 showed high diagnostic performance: AUROC of 0.903 for F≥2 (cut off=1.62, Se=81.3%, Sp=92.3%, Acc=90.7%) and 0.949 for F≥3 (cut off=2.59, Se=83.3%, Sp=97.9%, Acc=96.3%). Independent predictors of F≥2 included age (OR=1.15; 95%CI: 1.02 - 1.29), platelet count, (OR=0.97, 95%CI: 0.95 - 0.99), AST (OR=1.03, 95%CI: 1.01 - 1.06), and GGT (OR=1.04, 95%CI: 1.01 - 1.06). For F≥3, predictors included age (OR=1.19, 95%CI: 1.01 - 1.42), AST (OR=1.05, 95%CI: 1.01 - 1.09), and total cholesterol (OR=0.96, 95%CI: 0.93 - 0.99). Among prediabetic patients, 50% had F≥2 fibrosis and 41.7% had F≥3
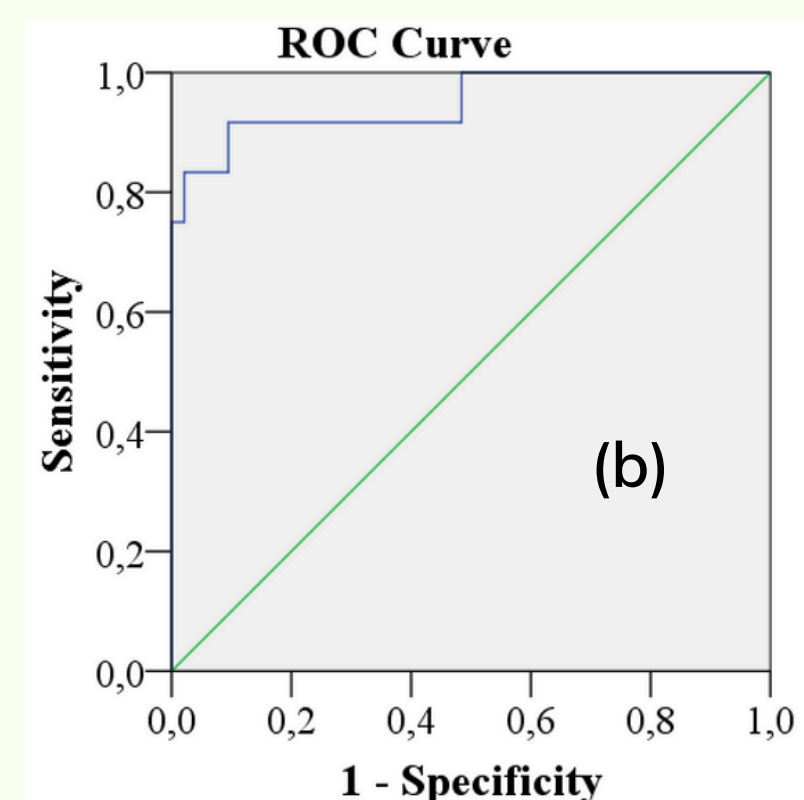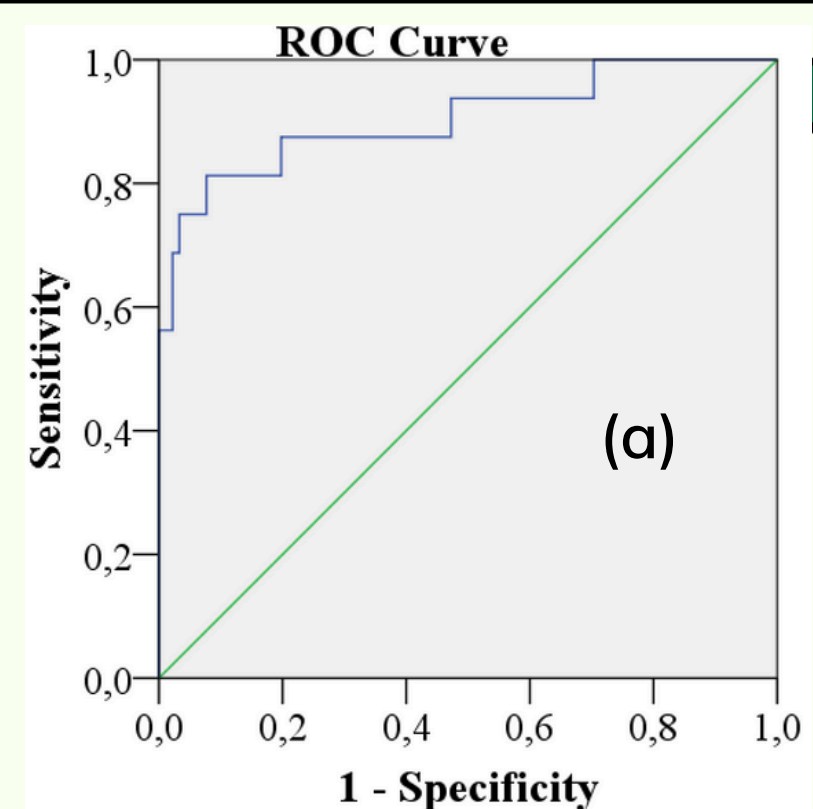
The AUC-ROC value of FIB-4 in predicting significant fibrosis (F≥2) (a) and advanced fibrosis (F≥3) (b)

Conclusion

Age, platelets, AST, GGT are significantly related to the degree of liver fibrosis. Age, AST, total cholesterol are associated with the severe degree of liver fibrosis