



Compensated Advanced Chronic Liver Disease in Nonalcoholic Fatty Liver Disease: Two-Step Strategy is Better than Baveno Criteria

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Abstract

Background Advanced fibrosis and cirrhosis (compensated advanced chronic liver disease [cACLD]) are clinically indistinguishable and increase risk of developing clinically significant portal hypertension. Baveno VII recommends using elastography to rule out and diagnose cACLD with liver stiffness measurement (LSM) cut-offs of 10/15 kPa.

Methods In a retrospective analysis of 330 nonalcoholic fatty liver disease (NAFLD) patients, performance of the Baveno VII cut-offs for diagnosing cACLD was compared with newly suggested lower cut-offs (8/12 kPa). A model for detecting cACLD among those with LSM between 8 and 12 kPa was developed and compared with recently published models.

Results Seventy (21.2%) of the 330 NAFLD patients had biopsy-proven cACLD. The Baveno VII cut-offs (10/15 kPa) had a lower sensitivity of 72.8% (60.9–82.8%) and a specificity of 93.4% (89.7–96.1%). Sensitivity and specificity of lower cut-offs (8/12 kPa) were 91.4% (82.3–96.8%) and 88.5% (83.9–92.1%), respectively. Modeling based on the presence of diabetes (odds ratio [OR] 3.625[1.161–11.320], $p=0.027$) and serum aspartate aminotransferase (AST) levels (OR 1.636[1.098–2.436], $p=0.015$) correctly identified 75.7% of patients with LSM between 8 and 12 kPa. Our model performed best with an area under receiver operator curve (AUROC) of 0.725 (95%CI 0.609–0.822), compared to Papatheodoridi (AUROC 0.626, CI 0.506–.736) and Zhou (AUROC 0.523, CI 0.403–0.640) models. A two-step strategy comprising application of lower LSM cut-offs followed by the predictive model correctly identified the presence of cACLD in 83% of the patients as compared to 75% by the Baveno VII cut-offs.

Conclusion A two-step strategy employing lower LSM cut-offs and modeling based on diabetes and AST levels outperforms Baveno VII cut-offs for identifying cACLD in NAFLD patients.

Keywords Decompensation · Metabolic syndrome · MAFLD · Portal hypertension · Fibrosis

Abbreviations

cACLD	Compensated advanced chronic liver disease
LSM	Liver stiffness measurement
TE	Transient elastography
NAFLD	Nonalcoholic fatty liver disease
BMI	Body mass index
DM	Diabetes mellitus
AST	Aspartate aminotransferase
ALT	Alanine aminotransferase
Alk P	Alkaline phosphatase
HBsAg	Hepatitis B surface antigen
FIB-4	Fibrosis-4 index
APRI	AST-to-platelet ratio index

CAP	Controlled attenuation parameter
IQR	Interquartile range
PPLB	Percutaneous plugged liver biopsy
NASH	Nonalcoholic steatohepatitis
CRN	Clinical research network
NAS	NAFLD activity score
PPV	Positive predictive value
NPV	Negative predictive value
PLR	Positive likelihood ratio
NLR	Negative likelihood ratio
DA	Diagnostic accuracy
AUROC	Area under receiver operator curve
OR	Odds ratio
CSPH	Clinically significant portal hypertension
CPA	Collagen proportionate area
HVPG	Hepatic venous pressure gradient

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