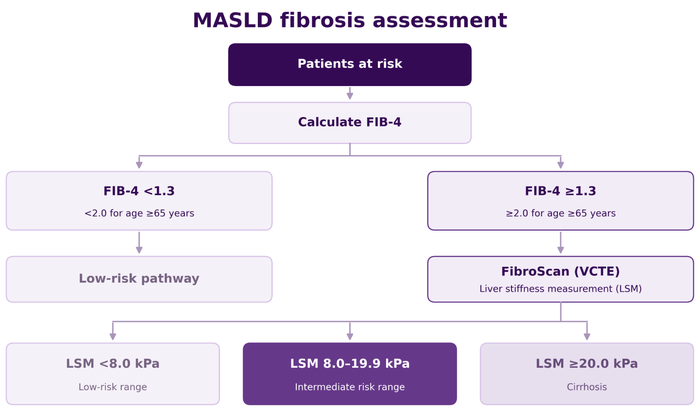
AIM-F Versus Liver Stiffness Measurement Alone for Detection of Advanced Fibrosis in MASLD With Elevated FIB-4 and Intermediate Liver Stiffness

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INTRODUCTION

Current guidelines for risk stratification of patients with MASLD use a two-step approach, using FIB-4 and Liver stiffness measurement (LSM). However, patients with elevated age-adjusted FIB-4 and intermediate LSM values (8.0-19.9 kPa) are not adequately risk stratified. The previously developed Advanced Fibrosis Identification in MASLD (AIM-F) score incorporates routinely available clinical, laboratory, and elastography measures to further stratify this population. In this study, we compared the performance of AIM-F and LSM alone for identifying biopsy-proven advanced fibrosis (F3 and F4).



MATERIALS & METHODS

- **Study design:** retrospective cross-sectional
- **Population:** Adults with metabolic dysfunction-associated steatotic liver disease (MASLD)
- **Data source:** National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) NAFLD 2 database
- **Eligibility:** Complete baseline clinical, laboratory, imaging, and histologic data; laboratory and imaging assessments obtained within 4 weeks of baseline
- **AIM-F score:** AIM-F is a weighted 13-point score incorporating female sex (2 points), LSM ≥12 kPa (4 points), HbA1c ≥6.5% (3 points), bilirubin ≥0.8 mg/dL (2 points), and INR ≥1.0 (2 points).

MATERIALS & METHODS (continued)

- **Test definitions:** AIM-F: positive at ≥3 points and negative at 0-2 points. LSM alone: positive at ≥12 kPa and negative at <12 kPa.
- **Reference standard:** Biopsy-proven advanced fibrosis, defined as stage F3-F4. Non-advanced fibrosis was defined as F0-F2.
- **Analysis:** Diagnostic performance of AIM-F and LSM alone was compared using sensitivity, specificity, positive predictive value, negative predictive value, false-negative classifications, true-negative classifications, and negative likelihood ratio.

RESULTS

- **Cohort:** Of 1,740 screened participants, 177 met eligibility criteria; 111 of 177 (62.7%) had biopsy-confirmed advanced fibrosis (F3-F4).
- **Diagnostic performance:** AIM-F has high sensitivity (95.5%) and negative predictive value (82.1%) compared with elastography alone. AIM-F reduced false-negative classifications from 39 to 5 compared with LSM ≥12 kPa alone. This gain in sensitivity was accompanied by lower specificity.

Performance measure	LSM ≥12 kPa	AIM-F ≥3 points
Sensitivity	64.9%	95.5%
Specificity	69.7%	34.9%
Positive predictive value	78.3%	71.1%
Negative predictive value	54.1%	82.1%
False negatives	39	5
True negatives	46	23
Negative likelihood ratio	0.50	0.13

Table 1. Diagnostic performance for biopsy-proven advanced fibrosis

Fibrosis stage	AIM-F negative 0–2 points, n = 28	AIM-F positive ≥3 points, n = 149
F0–F1	11 (39.3%)	22 (14.8%)
F2	12 (42.9%)	21 (14.1%)
F3	4 (14.3%)	75 (50.3%)
F4	1 (3.6%)	31 (20.8%)
F0–F2	**23 (82.1%)**	43 (28.9%)
F3–F4	5 (17.9%)	**106 (71.1%)**

Table 2. Biopsy fibrosis stage by AIM-F category

DISCUSSION

AIM-F demonstrated substantially higher sensitivity than LSM ≥12 kPa alone. Fewer false-negative classifications suggest that combining clinical, laboratory, and elastography variables may better identify advanced fibrosis than an LSM threshold alone, although with lower specificity. AIM-F may help identify patients at lower risk for advanced fibrosis, while AIM-F-positive results may warrant further evaluation. Similar multivariable noninvasive approaches, such as FAST and MEFIB, support combining complementary tests for liver disease risk stratification.[1,2] Further independent studies are needed to validate AIM-F across diverse MASLD populations.

CONCLUSIONS

AIM-F ≥3 points reduced missed advanced fibrosis compared with LSM ≥12 kPa alone among patients with elevated FIB-4 and intermediate LSM. External validation is needed before clinical implementation.

REFERENCES/CONTACTS

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