



Combination of LIVERSTAT and Fibroscan (LSM) Outperforms FIB-4 and LSM, for MASLD Advanced Fibrosis (F3F4)

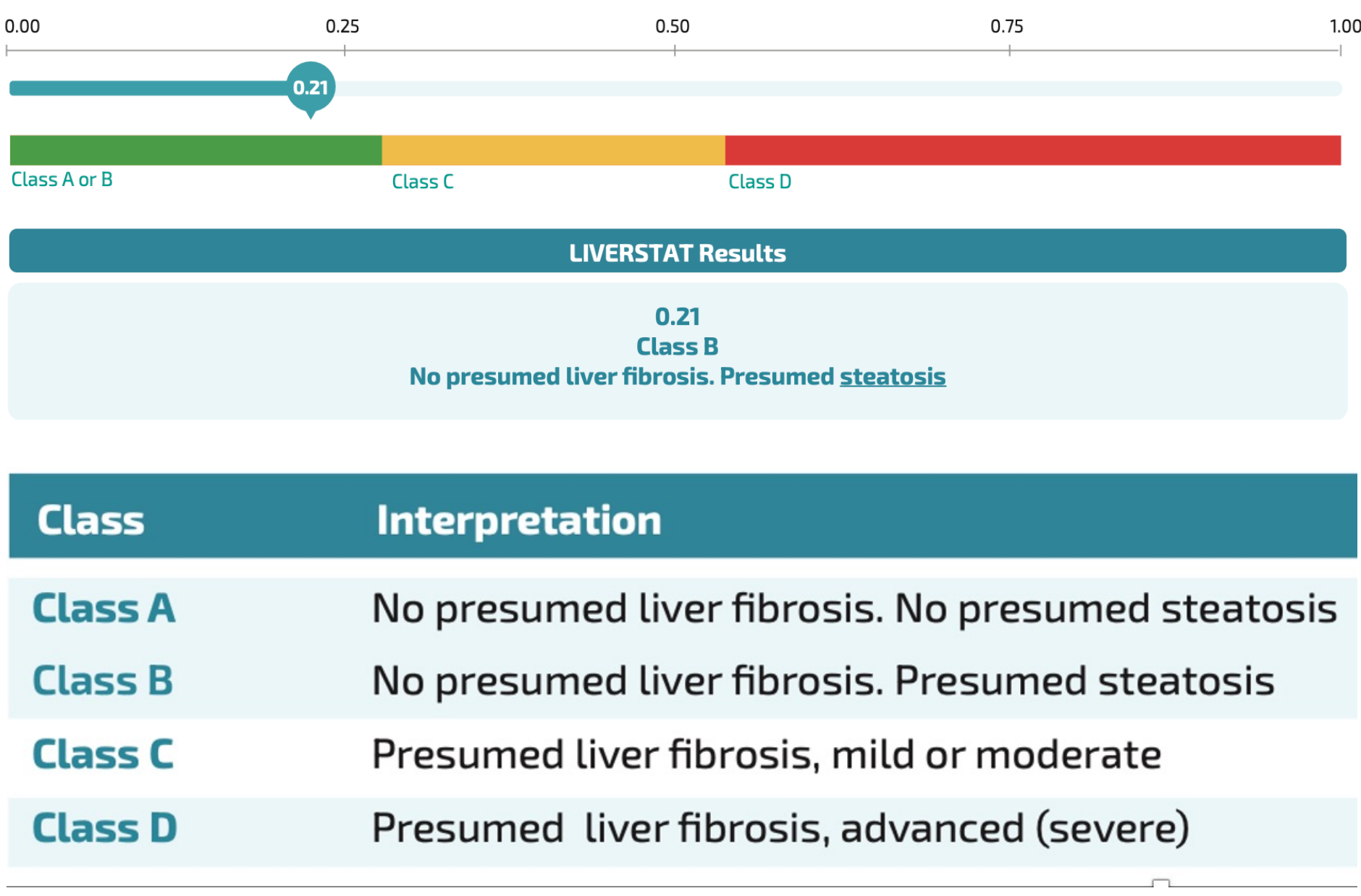
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BACKGROUND

LiverSTAT (Fibronostics, Florida, US) is an AI-based blood test conceived for MASLD risk stratification:

- Combines common biochemistry - liver enzymes, lipid panel, bilirubin and glucose - adjusted on anthropometrics: weight, height, age and gender
- Constructed and validated against liver biopsy to have high performance for advanced fibrosis [AUROC between 0.81 and 0.76]
- Outperforms FIB-4: no indeterminate zone, no drawbacks related to age or type 2 diabetes
- Provides presumed MASLD class and quantitative fibrosis score (0.00 to 1.00)

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AIMS

To retrospectively compare, the efficacy of two combinations in one-step approach with two biomarkers, LiverSTAT and LSM versus FIB-4 and LSM for the identification of advanced fibrosis (F3F4) in a multicenter multiethnic dataset of MASLD patients.

METHODS

Population & collected data

- Retrospective data collected in 5 hepatology tertiary centers (US, Malaysia, France) on MASLD adult patients that undergone LB (NASH-CRN histopathology scoring)
- LSM by Fibroscan (Echosens, Paris, France), [IQR <30% median LSM, ≥60% SR included]
 - FIB-4 and LiverSTAT biomarkers and patients’ anthropometrics

Statistics assessed the efficiency of the combination of tests using:

- Absolute number of identified F3F4 LB and F2-F4 LB and concordance rates with LB of both biomarkers
- Number needed to screen (NNS) to identify one subject with F3F4 LB

Cut-offs (according to AASLD CPG for FIB-4 and LSM)

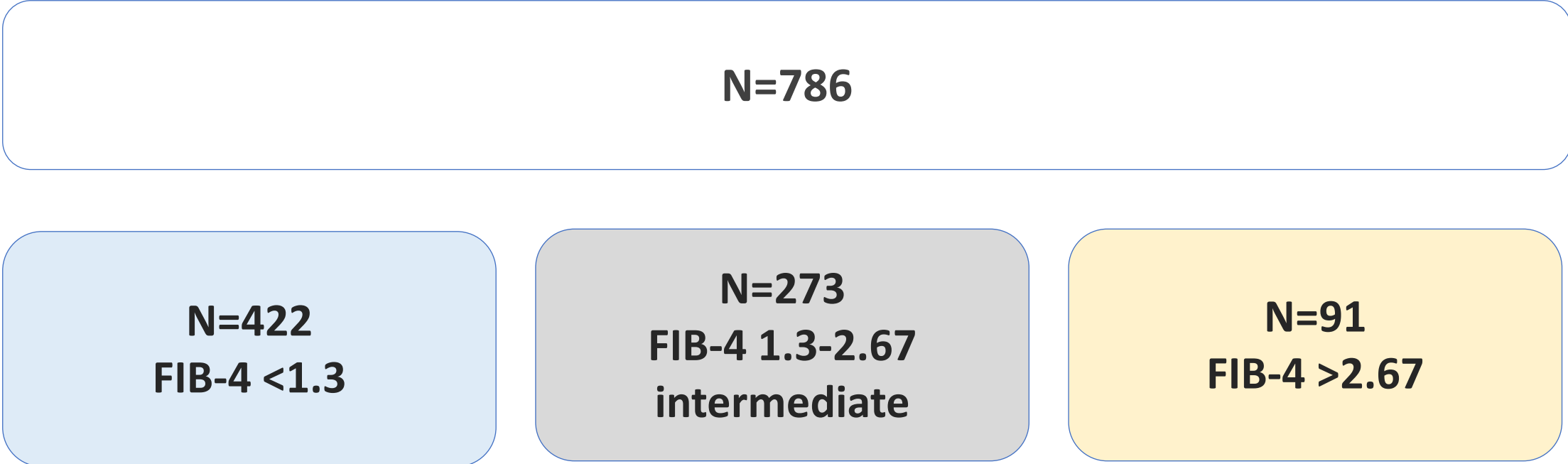
- FIB-4: ≤1.3 to rule out / >2.67 to rule in F3F4/ indeterminate zone between 1.3 and 2.67
- LSM: >12 kPa and to rule in F3F4/ 8 to 12kPa fibrotic NASH, low likelihood of F3F4
- LiverSTAT: ≥0.59 single cut-off for F3F4/ ≥0.49 single cut-off for F2-F4

RESULTS

Characteristics of included populations

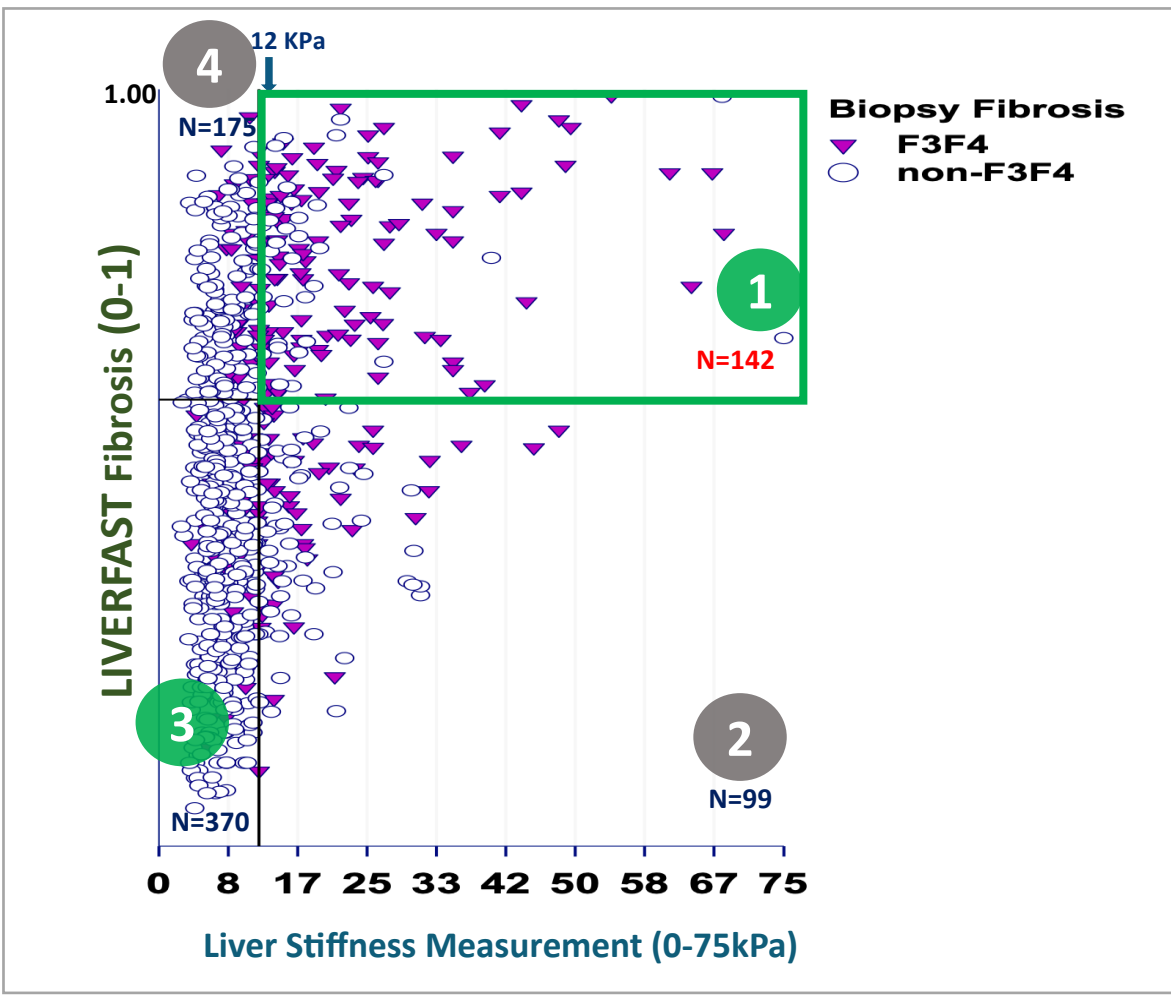
Characteristics	No (%), prevalence or Median (range)
Cohort origin	
US / Malaysia / France	174 (22.1%) / 308 (39.2%) / 304 (38.7%)
Gender Female	428 (54.5%)
Age, years	57.1 (18-85)
ALT, IU/L / AST, IU/L	52 (9-371) / 39 (12-335)
BMI, Kg/m²	31.4 (21.4-83.0)
Platelets (*10³)	240 (10-632)
FIB-4 score	1.52 (0-18.7)
<1.3 / intermediate / >2.67	422 (53.7%) / 273 (34.7%) / 91 (11.6%)
LiverSTAT Score (0-1)	0.52 (0.05-0.99)
LiverSTAT Fibrosis Staging	
Presumed F0 / F1F2 / F3F4	123 (15.6%) / 346 (44%) / 317 (40.3%)
LSM, kPa	9.5 (2.7-75)
LSM presumed F3F4/ noF3F4	454 (57.8%) / 332 (42.2%)
NASH-CRN Fibrosis Staging	
Stages F0 / F1 / F2	123 (15.6%) / 242 (30.8%) / 163 (20.7%)
Stages F3 / F4	189 (24.0%) / 69 (8.8%)

Agreement for advanced fibrosis of LiverSTAT and LSM with liver biopsy, respectively, according to FIB-4 group



	Concordance rate with LB staging F3F4 according to FIB-4 class		
FIB-4 Class	FIB-4 <1.3	FIB-4 1.3-2.67 intermediate	FIB-4 >2.67
LiverSTAT	70.3%	56.0%	70.1%
LSM (VCTE)	61.8%	43.2%	76.9%

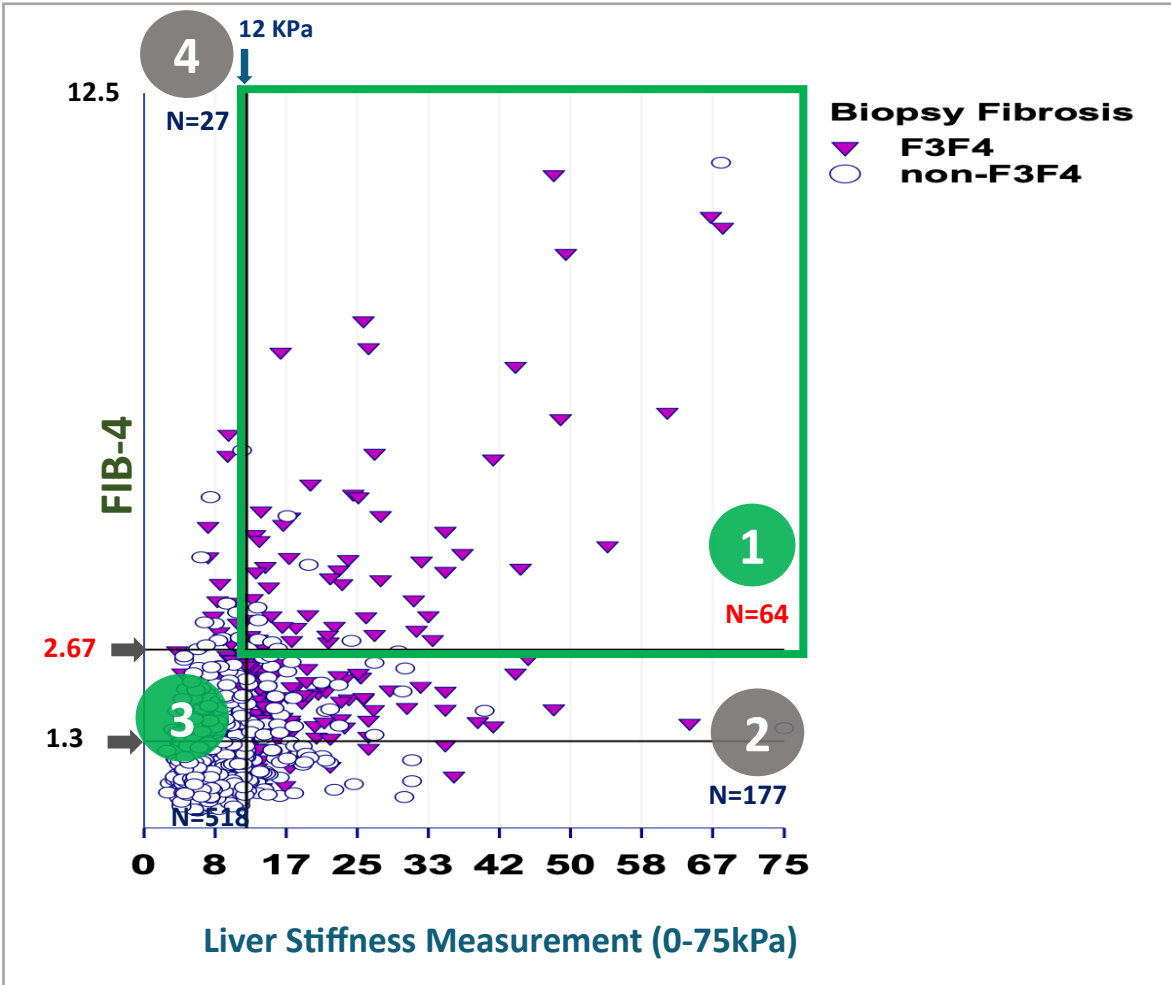
LIVERSTAT is highly effective to identify F3F4 in combination with Fibroscan



N=512/786 (65.1%) MASLD patients, LiverSTAT and LSM agree			
LIVERSTAT & LSM agree	Number	Biopsy confirms both NITs	Biopsy disagrees with both NITs
1 LIVERSTAT & LSM agree for F3F4 (LiverSTAT≥0.59 and LSM≥12kPa)	142	107/142 (75%)	35 double false positives (4.5% of the whole cohort and 6.8% of the cohort with LSM and LiverSTAT agreement)
3 LIVERFAST & LSM agree for F0-F2 (LiverSTAT<0.59 and LSM<12kPa)	370	315/370 (85%)	55 double false negatives (7% of the whole cohort and 10.7% of the cohort with LSM and LiverSTAT agreement)

- In the subgroup with ≥2 cm liver biopsy samples size, when LiverSTAT and LSM agreed:
- The confirmation rate for F3F4 increased from 75% to 86% (43/50) and
 - The number needed to screen (NNS*) for one additional patient to be confirmed as F3F4 decreased from 1.8 to 1.6

Low performance for identifying F3F4 of the actual standard-of-care tests, FIB-4 in combination with Fibroscan

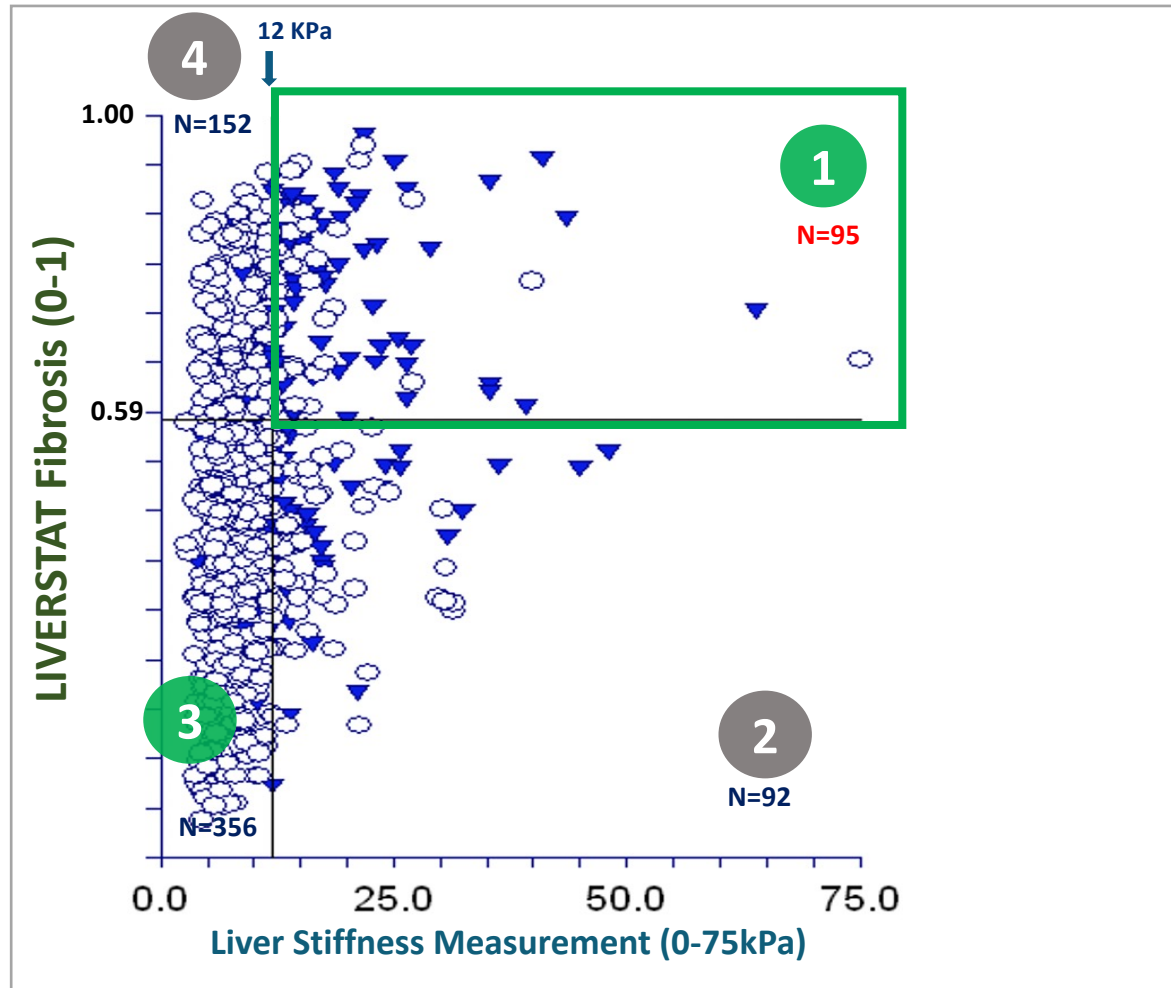


N=512/786 (65.1%) MASLD patients, LiverSTAT and LSM agree			
LIVERSTAT & LSM agree	Number	Biopsy confirms both NITs	Biopsy disagrees with both NITs
1 LIVERSTAT & LSM agree for F3F4 (FIB-4>2.67 and LSM >12kPa)	64	54/64 (84%)	10 double false positives (1.3% of the whole cohort and 1.7% of the cohort with LSM and FIB-4 agreement)
3 LIVERFAST & LSM agree for F0-F2 (FIB-4<1.3 and LSM <12kPa)	518	429/518 (83%)	89 double false negatives (11.3% of the whole cohort and 15.3% of the cohort with LSM and FIB-4 agreement)

- In the subgroup with ≥2 cm liver biopsy samples size, when LiverSTAT and LSM agreed:
- The confirmation rate for F3F4 increased from 75% to 86% (43/50) and
 - The number needed to screen (NNS*) for one additional patient to be confirmed as F3F4 decreased from 1.8 to 1.6

LiverSTAT along with LSM can help in the identification of F3F4 among FIB-4 scores ≤2.67

191/258 (74%) of patients with LB F3F4 had FIB-4 ≤ 2.67
59/191 (30%) of patients with LB F3F4 had FIB-4 <1.3, 132/191 (70%) of patients with FIB-4 in the “grey zone”



N=451/695 (65%) LiverSTAT and LSM agree in subjects with FIB-4 ≤2.67			
LIVERSTAT & LSM agree	Number	Biopsy confirms both NITs	Biopsy disagrees with both NITs
1 LIVERSTAT & LSM agree for F3F4 (LiverSTAT≥0.59 and LSM ≥12kPa)	95	64/95 (67%)	31 double false positives (4.5% of the whole cohort and 6.9% of the cohort with LSM and LiverSTAT agreement)
3 LIVERFAST & LSM agree for F0-F2 (LiverSTAT<0.59 and LSM <12kPa)	356	303/356 (85%)	53 double false negatives (7.6% of the whole cohort and 11.8% of the cohort with LSM and LiverSTAT agreement)

54/64 LB F3F4 patients had FIB-4 in the “grey zone” (1.3 to 2.67)
10/64 LB F3F4 patients had FIB-4 <1.3

DISCLOSURES

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CONCLUSIONS

- The study demonstrated the one-step assessment of MASLD-related fibrosis using the combination LiverSTAT and Fibroscan:
- Correctly identified twice as many F3F4 patients than the combination of FIB-4 and Fibroscan
- Does not miss F3F4 patients because of a “grey zone”
- Moreover, can help to detect 41% of F3F4 missed cases by FIB-4 “grey zone”
- Had a high concordance rate to rule in/out advanced fibrosis and, therefore, can work as an upfront screening for F3F4 before referral to more complex assessments