Performance of serological scores for liver steatosis among people living with HIV

SWISS HIV COHORT STUDY

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Riebensahm C[1,2], Brocker J[1], Berzigotti A[3,4], Surial B[1], Günthard H[5,6], Tarr P.E[7], Furrer H[1], Rauch A[1], Wandeler G[1,8], Swiss HIV Cohort Study

BACKGROUND

- Simple serological scores, such as the hepatic steatosis index (HSI) and fatty liver index (FLI) have been used to detect liver steatosis
- Their diagnostic value in people living with HIV (PLWH) is ill-defined
- We assessed the diagnostic performance of HSI and FLI in PLWH on antiretroviral therapy (ART) in the Swiss HIV Cohort Study (SHCS)

METHODS

- We included participants at Bern University Hospital with available transient elastography (TE) and laboratory parameters to calculate both scores
- Individuals with active or past viral hepatitis co-infection and pregnant women were excluded
- We defined severe hepatic steatosis (S3) as controlled attenuation parameter (CAP) ≥280dB/m using TE[1]
- HSI and FLI were calculated according to the following formulas:

HSI = ALT/AST ratio+BMI+2 (if diabetes)+2 (if female)
FLI = logistic (0.953*ln(TG)+0.139 *BMI+0.718+ln (GGT) +0.053 * waist-15.745) *100

- The validated diagnostic threshold for steatosis was HSI ≥36 and FLI ≥60

Table 1. Participants characteristics at time of transient elastography

Charakteristics	**n= 321**
Median age, years (IQR)	51 (42-59)
Female sex (%)	91 (28.4)
Region of origin (%)	
Europe	230 (71.7)
Africa	64 (19.9)
Other	27 (8.4)
HIV transmission group (%)	
MSM	152 (47.4)
Other	169 (52.6)
Body mass index ≥25 kg m² (%)	164 (51.1)
Diabetes (%)	26 (8.1)
Hazardous alcohol consumption (%)	66 (22.8)
Elevated ALT, U/L (%)	111 (34.6)
Median CD4+ count, cells/µl (IQR)	757 (546-933)
ART duration, years (IQR)	12.3 (6-19)
Severe liver steatosis based on TE (%)	107 (33.3%)

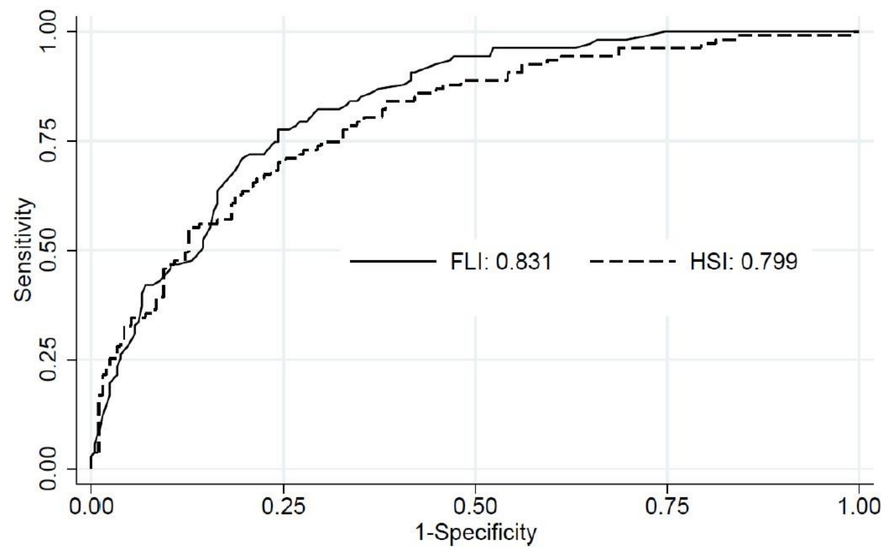
Abbreviations: IQR, interquartile range; MSM, men who have sex with men; PWID, patients who inject drugs; BMI, body mass index; CV, cardiovascular; ALT, alanine aminotransferase; AST, aspartate aminotransferase; ART, antiretroviral therapy; TAF, tenofovir alafenamide ; InSTI , integrase strand transfer inhibitor.

- HSI and FLI can be used as simple diagnostic tools to detect severe liver steatosis in PLWH
- The accuracy of serological scores seems best among PLWH aged <50 years

RESULTS

- Of 418 consecutively enrolled patients, 321 (76.8%) had data on both scores and a reliable TE
- 107 (33.3%) participants had severe steatosis based on TE, 128 (39.9%) had a HSI ≥36 and 125 (38.9%) FLI ≥60
- HSI and FLI showed similar sensitivity and specificity to detect severe steatosis in the whole study population
- AUROC for the diagnosis of severe steatosis using HSI and FLI was highest among patients <50 years

Figure 1. Receiver operator characteristic (ROC) curve for FLI (solid line) and HSI (dashed line) for the detection of severe liver steatosis (S3) in the whole study population. Numbers represent the area under the curve (AUC) measures for steatosis classification.



FLI, fatty liver index; HSI, Hepatic steatosis index

RESULTS (cont.)

Table 2. Accuracy of serological scores for detection of severe liver steatosis, by age and sex

Score	Population	AUC (95% CI)	Sensitivity %	Specificity %
HSI ≥ 36	Full cohort	0.80 (0.75-0.85)	70.1 (60.5-78.6)	75.2 (68.9-80.9)
	Age <50 years	0.86 (0.78-0.93)	87.9 (71.8-96.6)	75.7 (66.6-83.3)
	Age ≥50 years	0.79 (0.72-0.85)	62.2 (50.1-73.2)	74.8 (65.2-82.8)
	Female	0.86 (0.77-0.94)	88 (68.8-97.5)	66.7 (54.0-77.8)
	Male	0.80 (0.74-0.86)	64.6 (53.3-74.9)	79.1 (71.6-85.3)
FLI ≥ 60	Full cohort	0.83 (0.79-0.88)	72 (62.5-80.2)	77.6 (71.4-83.0)
	Age <50 years	0.88 (0.82-0.94)	75.8 (57.7-88.9)	82.9 (74.6-89.4)
	Age ≥50 years	0.80 (0.73-0.86)	70.3 (58.5-80.3)	71.8 (62.1-80.3)
	Female	0.85 (0.77-0.93)	76 (54.9-90.6)	81.8 (70.4-90.2)
	Male	0.82 (0.77-0.88)	70.7 (59.7-80.3)	75.7 (68.0-82.4)

CONCLUSION

- The AUROC for diagnosing severe liver steatosis was ≥0.8 for HSI and FLI
- Among PLWH, HSI and FLI show a higher accuracy in patients aged < 50 years and in females
- Larger studies are needed for the validation of serological scores to detect severe liver steatosis in patient subgroups

References

[1] Karlas T, Petroff D, Sasso M, et al. Individual patient data meta-analysis of controlled attenuation parameter (CAP) technology for assessing steatosis. J Hepatol 2017

ADDITIONAL KEY INFORMATION

***Contact**: Riebensahm,Carlotta, MD, carlotta.Riebensahm@insel.ch*

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***Affiliations:** [1]Department of Infectious Diseases, Bern University Hospital, University of Bern, Switzerland, [2]Graduate School of Health Sciences, University of Bern, Switzerland, [3]Department for Visceral Surgery and Medicine, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland, Switzerland, [3]Hepatology, [4]Department of BioMedical Research, University of Bern, Bern, Switzerland, [5]Division of Infectious Diseases and Hospital Epidemiology, University Hospital Zurich, University of Zurich, [6]Institute of Medical Virology, University of Zurich, [7]University Department of Medicine, Kantonsspital Bruderholz, University of Basel, [8]Institute of Social and Preventive Medicine, University of Bern, Switzerland*

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