

Prevalence and correlates of Hepatic Steatosis and Metabolic-associated Fatty Liver Disease in a cohort of People Living With HIV

F. Panza^{1,2}, M. Crispo^{1,2}, D. Romano¹, M. Sambo^{1,2}, A. Bailoni^{1,2}, M. Barsotti¹, F. Pippi², M. Trezzi², F. Montagnani^{1,2}, M. Tumbarello^{1,2}, M. Fabbiani^{1,2}.

¹Department of Medical Biotechnologies, University of Siena, Siena, Italy; ²Infectious and Tropical Diseases Unit, Siena University Hospital, Siena, Italy.

Introduction

- Fat accumulation in the liver is increasingly being recognised in People Living With HIV (PLWH), potentially due to a combination of traditional risk factors and HIV- or antiretroviral therapy-related variables¹
- Therefore, the prevalence and correlates of Hepatic Steatosis (HS) and Metabolic-associated Fatty Liver Disease (MAFLD) need to be adequately investigated in PLWH

Methods

- Prospective single-center cross-sectional study, consecutively enrolling PLWH during routine visits at the Infectious and Tropical Diseases Unit of the University Hospital of Siena
- Exclusion criteria: age <18 years, active viral hepatitis, pregnancy and hazardous alcohol intake
- Patients underwent transient elastography to measure hepatic steatosis (HS) by controlled attenuation parameter (CAP, dB/m) and liver fibrosis by liver stiffness (kPa)
- MAFLD was defined according to literature criteria²
- Lifestyle habits were investigated by a structured questionnaire
- Clinical and laboratory variables were retrieved through medical record review
- Variables associated with CAP were explored by linear regression analysis, while those associated with MAFLD were investigated by logistic regression

Results 1

Table 1: Population main characteristics N = 119

Variables	N (%) or median (IQR)
Age (years)	55 (47-62)
Female gender	29 (24.4)
Not Italian born	29 (24.4)
Risk factor: IDU	9 (7.6)
Comorbidities:	
- Diabetes	8 (6.7)
- Dyslipidemia	66 (55.5)
- Obesity	15 (12.6)
- Hypertension	38 (31.9)
- Ischemic heart disease	5 (4.2)
- Cerebrovascular disease	3 (2.5)
- Peripheral vascular disease	14 (11.8)
- Chronic renal diseases	7 (5.9)
- Cancer	4 (0.8)
- Liver cirrhosis	1 (0.8)
Co-infections:	
- HBV	5 (4.2)
- Previous HCV	16 (13.4)
Concomitant therapies:	
- Statin	12 (10.1)
- Other lipid lowering drugs	13 (10.9)

Results 2

Table 2: Lifestyle habits variables

Variables	N (%)
Smoker	45 (37.8)
Regular alcohol intake	10 (8.4)
Regular physical activity	27 (22.7)
Sedentary work	58 (48.8)
Familiarity for cardiovascular diseases	28 (23.5)

Table 3: Metabolic variables

Variables	N (%) or median (IQR)
Body mass index (BMI)	25.6 (22.3-27.7)
Pathologic waist circumference	55 (46.2)
Pathologic waist/hip ratio	101 (84.9)
Pathologic blood pressure	39 (32.8)
Metabolic syndrome	20 (16.8)
ASCVD score	4.9 (2.3-12.5)
Estimated 10-year ASCVD risk:	
- Low (<5%)	53 (44.5)
- Borderline (5-7.4%)	14 (11.8)
- Intermediate (7.5-19.9%)	27 (22.7)
- High (>=20%)	10 (8.4)
- Unknown	15 (12.6)
HOMA score	1.79 (1.18 - 4.31)
Insulin resistance	47 (39.5)

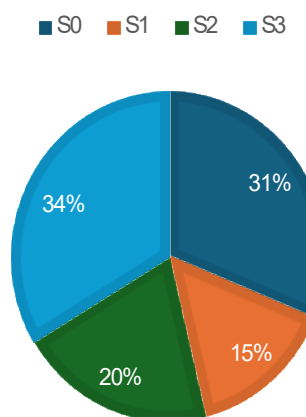
Table 4: Viro – immunological variables

Variables	N (%) or median (IQR)
Years from HIV diagnosis	15.7 (8.6 – 22.6)
CD4 at nadir (cells/mm ³)	166 (58 – 319)
HIV-RNA at zenith (log copies/mL)	5.17 (4.40 – 5.57)
Past AIDS defining events	15 (12.6)
Years from first ART	12.1 (7.6 – 17.9)
On ART	117 (98.3)
Years from last ARV regimen	2.4 (1.3 – 4.0)
Type of ART:	
- InSTI based	44 (37)
- PI based	4 (3.4)
- NNRTI based	19 (16.0)
- Dual	47 (39.5)
- Other regimens	5 (4.2)
Therapeutic line	5 (3 – 7)
HIV-RNA <50 copies/mL	103 (86.6)
CD4	761 (545-1067)
CD4%	35.5 (24.8-42.3)
CD4/CD8	0.88 (0.52-1.32)

Results 3

TRANSIENT ELASTOGRAPHY FINDINGS

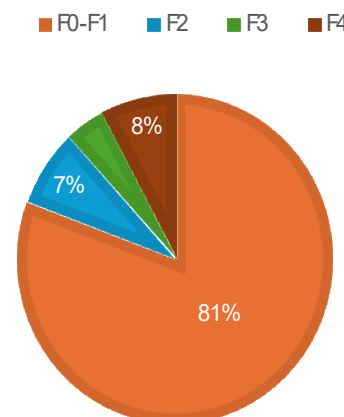
LIVER STEATOSIS



Liver steatosis categories³:

- S0: < 238 dB/m
- S1: 238-259 dB/m
- S2: 260-291 dB/m
- S3: >292 dB/m

LIVER FIBROSIS



Liver stiffness categories⁴:

- F0-F1: < 6.65 kPa
- F2: 6.65-7.9 kPa
- F3: 7.9-9.6 kPa
- F4: >9.6 kPa

- Overall, 59 (92.2% of S2-S3 and 49.6% on the total population) PLWH met criteria for MAFLD
- After adjustment for several confounding factors, only BMI was found to be associated with CAP (mean change +6.2 dB/m for +1 Kg/m², 95% CI 3.7-8.7, p<0.001)
- Regular physical activity was independently associated with reduced risk of MAFLD (aOR 0.32, 95% CI 0.12-0.87, p=0.026)
- HIV- and ART-related variables did not show any association with CAP or MAFLD
- Both S2-S3 steatosis (OR 3.91, 95% CI 1.34-11.39, p=0.012) and MAFLD (OR 3.64, 95% CI 1.32-10.05, p=0.012) were found to be associated with higher risk of significant liver fibrosis (F2-F4)

Conclusions

- Hepatic Steatosis and MAFLD show a high prevalence in PLWH
- BMI and lifestyle factors were strongly associated with HS and MAFLD
- A role of HIV- and ART-related variables was not demonstrated in this cross-sectional analysis
- Given the association between HS/MAFLD and significant liver fibrosis, these metabolic conditions should be adequately approached in PLWH to avoid progression to advanced liver disease

References

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