PRESENCE OF EXCESS VISCERAL ABDOMINAL FAT IMPACTS METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE (MASLD) IN PEOPLE WITH HIV

#604

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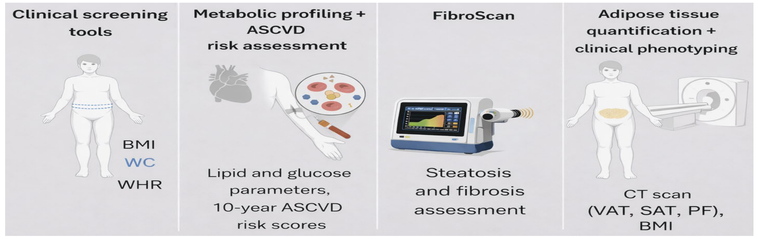
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Background

- The prevalence of Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) is a growing concern among people with HIV (PWH), driven in part by the rising prevalence of obesity.[1,2]
- A recent study demonstrated a MASLD prevalence of 52% and an advanced fibrosis prevalence of 15% in a cohort of PWH.[3]
- Excess visceral abdominal fat (EVAF) drives steatohepatitis through the free flow of fatty acids and *de novo* lipid synthesis. EVAF has been shown to be a significant risk factor for MASLD in the general population.[4,5]
- Here, we sought to investigate how EVAF impacts hepatic steatosis (HS) and hepatic fibrosis (HF) in PWH.

How does EVAF impact HS in PWH, including those with normal BMI?

Methods



- The **V**isceral **A**diposity **M**easurement and **O**bservations **S**tudy (**VAMOS;** NCT05383456) is a cross-sectional, multi-center observational study completed in 2023 in PWH who:
  - Had virologic suppression on ART for at least 1 year; and,
  - BMI 20 to 40 kg/m^2
- Participants completed non-contrast abdominal and chest computed tomography (CT) scans, transient elastography and labs in the overnight fasting state.
- EVAF was quantified via abdominal CT scan at the L4-5 vertebral level and defined as a visceral adipose tissue (VAT) area ≥130 cm^2. Waist circumference (WC) was measured at the umbilicus on bare skin in a horizontal plane.
- HS and HF were assessed via transient elastography (FibroScan®). HS and HF were defined as controlled attenuation parameter (CAP)>238 dB/m and liver stiffness measurement (LSM)>7.0 kPa, respectively.
- *Statistical analysis:* Odds ratios (OR) & 95% confidence intervals (CIs) were estimated using logistic regression. Spearman correlations were used to assess relationships between HS & HF with different anthropometric measures.

Study Population

- 170 participants had paired CT scans and lab measurements. 89% were male, 70% white, with a mean age of 54 years.

Excess visceral abdominal fat (EVAF) is a major driver of hepatic steatosis (HS) in PWH, tripling the odds of HS compared to those without EVAF.

One-third of PWH with normal BMI had HS, and 75% of these normal weight HS cases had EVAF, highlighting hidden metabolic risk not captured by BMI alone.

Results

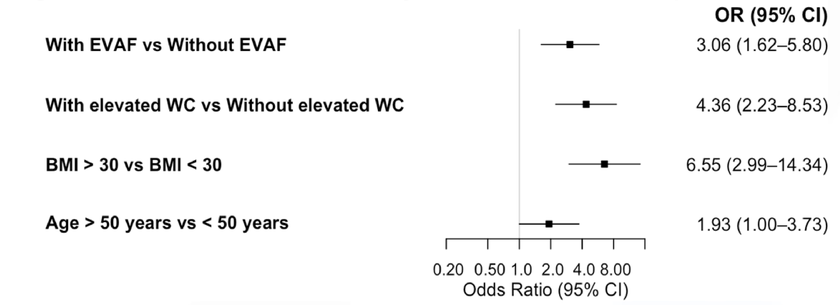
Table 1: Comparison of clinical and hepatic measures by EVAF status.

	All participants	With EVAF	Without EVAF	p-value
HS,* (%)	89 (53.61%)	62 (65.26%)	27 (38.03%)	**0.0005**
HF,* (%)	28 (16.87%)	20 (21.05%)	8 (11.27%)	0.0958
CAP (dB/m),* mean ± SD	247.69 ± 49.50	260.84 ± 49.71	230.08 ± 43.68	**<0.0001**
LSM (kPa),* mean ± SD	6.10 ± 4.72	6.84 ± 5.96	5.11 ± 1.73	**0.0186**
AST (U/L),¥ mean ± SD	22.62 ± 8.17	23.31 ± 8.55	21.68 ± 7.60	0.1904
Elevated AST,¥ %	7 (4.12%)	4 (4.08%)	3 (4.17%)	0.9780
ALT (U/L),¥ mean ± SD	28.22 ± 17.48	31.40 ± 19.03	23.90 ± 14.11	**0.0054**
Elevated ALT,¥ (%)	11 (6.47%)	9 (9.18%)	2 (2.78%)	0.0934
FIB-4,# mean ± SD	1.15 ± 0.55	1.22 ± 0.57	1.06 ± 0.50	0.0606
High FIB-4, # (%)	2 (1.20)	2 (2.11)	0 (0%)	0.2155

*Values were missing for some participant assessments. *, n = 166; #, n = 167; ¥, n = 170.*

- HS was significantly more prevalent among participants with EVAF compared to those without EVAF (p = 0.0005) **(Table 1).**
- Additionally, CAP, LSM, and ALT levels were significantly higher in participants with EVAF compared to those without EVAF (p < 0.0001, p = 0.0186, and p = 0.0054, respectively). **(Table 1)**
- Higher odds of HS were associated with BMI >30 kg/m^2, presence of EVAF, and an elevated WC (**Figure 1**).

Figure 1: Associations between key clinical factors and hepatic steatosis.



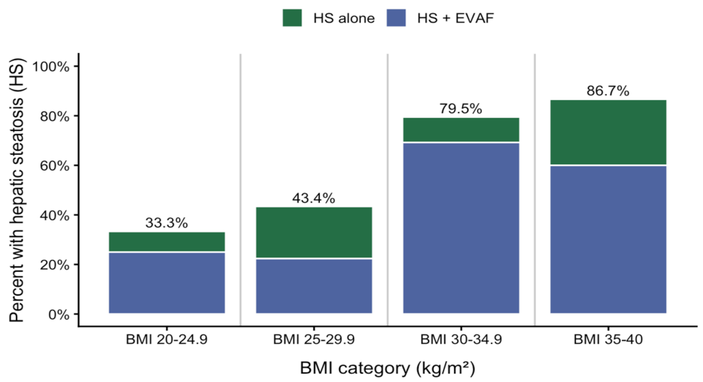
Results

Table 2: Spearman correlations between body composition measures and hepatic parameters.

	Hepatic Steatosis (HS)		Hepatic Fibrosis (HF)	
	Spearman's ρ	p-value	Spearman's ρ	p-value
VAT	0.42254	**<.0001**	0.15822	**0.0417**
SAT	0.43102	**<.0001**	0.24750	**0.0013**
BMI	0.47902	**<.0001**	0.14311	0.0658
WC	0.50723	**<.0001**	0.26818	**0.0005**

- HS demonstrated a moderate positive relationship with VAT, subcutaneous adipose tissue (SAT), BMI, and WC (**Table 2**).
- HS was seen across all BMI categories. In participants with HS, most participants also had EVAF. Most notably, 75% of individuals with normal BMI (20-24.9 kg/m^2) and HS had EVAF (**Figure 2**).

Figure 2: High prevalence of EVAF is seen in PWH with HS, regardless of BMI.



Conclusions

- HS and HF are common among PWH, particularly among PWH with EVAF or elevated WC.
- Normal-weight HS was seen in 33% of the VAMOS cohort, driven largely by the presence of EVAF.
- Incorporating tools to assess EVAF in clinical care, such as measuring WC, could provide critical information in identifying PWH at risk of HS.

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[1]Maurice JB et al, AIDS. 2017; [2]Lake JE et al., Clin Gastroenterol Hep. 2022; [3]Gawrieh S et al, Aliment Pharmacol Ther. 2024; [4]Park BJ et al, J Gastroenterol Hepatol. 2008; [5]Bansal S et al, Human Nut Metab. 2023.