INVESTIGATION OF CLASSIC AND HIV-RELATED FACTORS FOR HEPATIC STEATOSIS AMONG PWID

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BACKGROUND

- The prevalence of hepatic steatosis in the USA is 24% and projected to increase with time
- Fatty liver is a risk factor for subsequent steatohepatitis, fibrosis and hepatocellular carcinoma; moreover, these individuals frequently have metabolic comorbidities
- The prevalence and associations of hepatic steatosis among people who inject drugs (PWID) is unclear

OBJECTIVE

- To determine the associations of significant hepatic steatosis in a community cohort of HIV infected and uninfected individuals with a history of IV drug injection

METHODS

Study population

- This comprised 1,174 adults enrolled in the ALIVE (AIDS Linked to the Intravenous Experience) study with a validated liver elastography measurement between January 2017 and June 2019

Hepatic steatosis

- This was measured by vibration controlled transient elastography (VCTE) with controlled attenuation parameter (CAP) with the FibroScan device. A CAP ≥270 dB/m was considered significant steatosis.

Other covariates

- Age, sex/gender, race/ethnicity, at-risk alcohol use, current injection drug use, HCV exposure, liver stiffness, BMI, waist circumference, blood pressure, blood glucose, serum cholesterol, HIV RNA, CD4 and ART regimen

Statistical analyses

- Adjusted linear and logistic regression models compared the odds of significant steatosis by demographic, clinical and HIV-related covariates among all participants
- Further stratification by sex/gender and HIV infection status was performed
- A less restrictive CAP cut point was utilized in sensitivity analyses

Among HIV-infected ALIVE participants, those on an *INSTI based ART regimen* were twice as likely to have significant hepatic steatosis than those on PI based ART regimen.

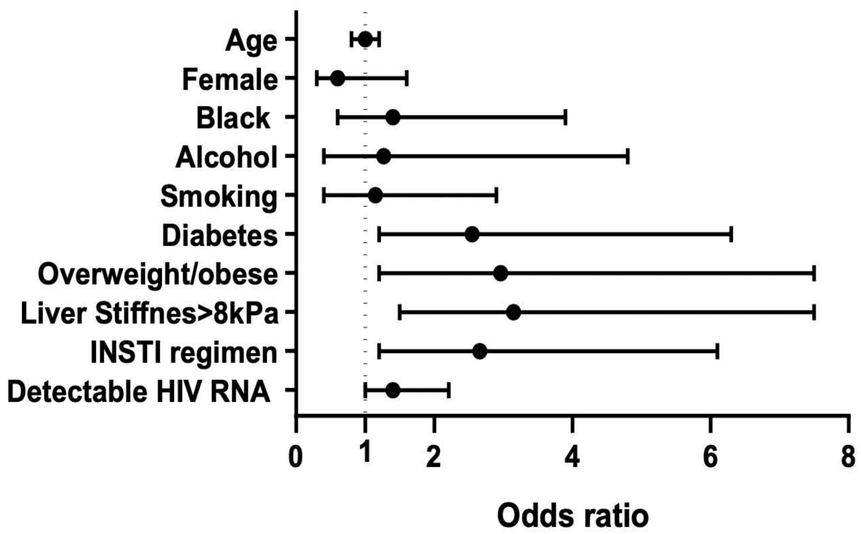
RESULTS

Table 1: Characteristics of participants

Characteristic	No Steatosis N=934 n(%)	Steatosis N=240 n(%)	p-value
Sex/gender (women)	272 (30)	103 (43)	**0.000**
Age (mean±SD)	53.9 ± 9.8	54.5 ± 8.8	0.145
Race/ethnicity (black)	736 (79)	184 (77)	0.474
Current IVDU	410 (44)	60 (25)	**0.000**
Cigarette smoking	724 (77)	150 (63)	**0.000**
Alcohol use*	174 (19)	37 (15)	**0.446**
Overweight	314 (34)	64 (27)	**0.000**
Obese	133 (14)	157 (65)	**0.000**
Diabetes **	200 (21)	88 (37)	**0.000**
Hypertension***	483 (52)	149 (62)	**0.004**
Elevated cholesterol	161 (17)	67 (28)	**0.001**
Liver stiffness >8kPa	258 (28)	88 (37)	**0.006**
HCV exposed	733 (78)	186 (77)	0.825
HIV positive	273 (30)	58 (24)	0.120
INSTI ART regimen	86 (9)	30 (12)	0.141
PI/other ART regimen	107 (11)	26 (11)	0.141
HIV RNA ≥400 copies/ml	360 (39)	77 (32)	0.491
CD4 <500 cells/mm^3	164 (18)	27 (11)	0.123

Statistically significant values shown in bold font; level of significance was set at p=0.05.
Differences in categories were assessed using X^2, ANOVA and Mann-Whitney tests where appropriate
Abbreviations: INSTI, Integrase strand surface inhibitor; ART, Antiretroviral therapy; PI, Protease inhibitor; IVDU, intravenous drug use
*At-risk alcohol use was defined as having a total AUDIT score >8
**Diabetes was defined as having a glycated hemoglobin (Hba1c) >6.5% or being on treatment for diabetes
***Hypertension was defined as blood pressure above 140/90mmHg or treatment for hypertension

Adjusted associations of hepatic steatosis among HIV infected participants



DISCUSSION

- Prevalence of steatosis was 20% with a higher prevalence in women (25%) compared to men (18%)
- Measures of adiposity and hepatic fibrosis were strongly associated with steatosis
- Males with steatosis were more likely to be overweight/obese and women were more likely to have diabetes
- Among HIV-infected participants, steatosis was associated with detectable HIV RNA and an INSTI based ART regimen

CONCLUSIONS

- As PWID age and develop comorbid conditions, prevalence and morbidity of hepatic steatosis will likely increase
- Further research is needed to establish the mitigating factors of INSTI therapy and development of obesity among PWID in the HIV care continuum