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Prevalence of hepatic steatosis among HIV-infected patients in Lagos University Teaching Hospital, and associated risk factors

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Background: Non-Alcoholic Fatty Liver Disease (NAFLD) is the presence of intrahepatic fat of at least five percent of liver weight in the absence of competing liver disease etiologies. The spectrum of NAFLD includes hepatic steatosis, non-alcoholic steatohepatitis with/without fibrosis (NASH), and cirrhosis. NAFLD is increasingly recognized as an important cause of liver disease in HIV-infected patients. Abdominal ultrasonography is a reliable method of assessing hepatic steatosis, and is currently the most feasible and accessible screening tool for NAFLD in Africa.
The objective of this study was to determine the prevalence of hepatic steatosis in HIV patients in LUTH using abdominal ultrasonography, and determine its associated risk factors.

Methodology: This cross-sectional, descriptive study included HIV-infected adult (>18 years) subjects attending the HIV clinic at Lagos University Teaching Hospital between November 2018-February 2020. Subjects were enrolled from a larger NCI funded study examining biomarkers associated with HIV-associated HCC. Subjects with liver cancer were excluded. The following characteristics were assessed: basic demographics, full blood count, liver function tests, serum creatinine, alpha-fetoprotein, CD4 count, HIV viral load, viral hepatitis screening (HBsAg and anti-HCV), abdominal ultrasonography, and liver stiffness measurement with transient elastography. Hepatic steatosis was defined as the presence of a hyperechoic liver on abdominal ultrasonography. Association of steatosis with categorical and numerical characteristics was assessed using chi square test and Mann Whitney U tests respectively, and significance was set at 0.05. Statistical analyses were performed using R version 4.0.2. Only univariate analyses are presented.

Results: Two hundred and thirty six subjects were recruited, 58.5% females. The median (IQR) age was 47 years (40.8, 54.0), BMI 27.4 Kg/m^2 (23.6, 31.3), and liver stiffness measurement (LSM) 4.8kPa (4.1, 7.0). Fifteen (6.5%) subjects each were positive for HBsAg and anti-HCV antibodies. Hepatic steatosis was present in 14 (5.9%), and was positively associated with hepatomegaly ($p<0.005$), but not with gender, alcohol or herbal use, smoking, or viral hepatitis status. Compared with those without steatosis, subjects with steatosis had significantly higher median BMI (32.9 vs 27.2 Kg/m^2; p= 0.009), longer duration of HIV infection (13.5 years vs 10 years; p=0.04), longer time on ART (13.5 years vs 9 years; p= 0.01), and higher liver stiffness measurements (8.5 kPa vs 4.8 kPa, p=0.002). They also had higher median ALT and AST levels IU/mL (24.5 vs.13.2, and 33.0 vs 24.3 respectively; $p<0.05$), lower median platelet counts (172,500 vs 214,500 cells/mm^3, p=0.01), and higher median on-ART CD4 counts (673 vs 497 cells/mm^3, p=0.015) than subjects without steatosis. There was no association of steatosis with age,

pre-ART CD4 count, HIV VL (pre-ART and on-ART), or levels of hemoglobin, protein, albumin, creatinine, INR, or alpha-fetoprotein.

Conclusion: There was a relatively low prevalence of fatty liver in this Nigerian cohort compared with other European and US cohorts (13-55%). Higher BMIs, and a longer duration of HIV and ART were observed in patients with steatosis compared to those without. Strategies to manage fatty liver in people living with HIV (PLH) including lifestyle changes and weight loss are recommended, as well as early linkage to specialist care. Further work is planned to examine independent risks factors associated with hepatic steatosis and liver outcomes in larger cohorts of PLH in this region, as well as exploring more sensitive measures of fatty liver disease.

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