641-Increased Rates of Hepatic Steatosis in Young Adults with Lifelong HIV Infection

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BACKGROUND

- Liver disease is a leading cause of morbidity and mortality in persons living with HIV (PLWHIV).
- NAFLD (non-alcoholic fatty liver disease) is an increasingly common cause of liver disease and can present as simple hepatic steatosis, NASH (non-alcohol steatohepatitis), liver cirrhosis and/or hepatocellular carcinoma.
- Factors that put HIV populations at increased risk for developing NAFLD include: metabolic syndrome, obesity, chronic inflammation and certain ARTs.
- Little is known about the liver status of patients living with HIV since childhood.
- As this unique population with life-long HIV ages, concerns over hepatic and metabolic health gain increasing importance.

METHODS

- A cohort of 46 young adults who acquired HIV early in life (i.e. perinatal or transfusion) and 9 healthy controls completed fasting transient elastography and laboratory tests.
- Transient elastography permits effective, non-invasive assessment of liver steatosis and fibrosis.
- Liver stiffness and controlled attenuation parameter (CAP) measurements were obtained using the Echosens FibroScan 502™.
- Accuracy of CAP score for hepatic steatosis has been validated against liver biopsy.[1]
- A CAP score >248 dB/m was used to define hepatic steatosis (see Figure 1)
- Anthropometrics, BMI, lipid panel, glucose, CD4 and HIV viral load were measured.
- We used non-parametric statistics for between group comparisons.

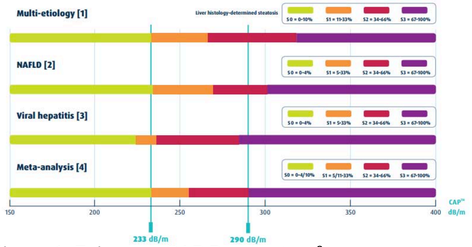


Figure 1. Echosens CAP Parameters[2]

RESULTS

Table 1. Clinical Demographics

Variable	PLWHIV (n= 46)	Controls (n=9)	P-Value
Age, y	26 (24-30)	23 (20-24.5)	0.003
Sex, n (%)			
Male	22 (48)	3 (33)	
Female	24 (52)	6 (67)	0.42
Race/Ethnicity, No. (%)			
Caucasian	25 (54)	9 (100)	
Black	16 (35)		0.02/0.53
Mixed	5 (11)	1 (11)	
Hispanic	9 (20)		
BMI, kg/m^2	23 (21-26)	25 (22-29)	0.219
Obesity, n (%)	10 (22)	1 (11)	0.08
Lipid lowering Rx, n (%)	2 (4)	0	0.40
ART exposure, y	19 (12-23)		

Table 2. Measurements

Variable	PLWHIV (n=46)	Controls (n=9)	P-Value
Waist Circ., cm	88.4 (81-119)	76.8 (71.8-85.6)	0.01
Waist/Hip Ratio	0.91 (0.86-0.96)	0.80 (0.75-0.84)	0.0002
Triglycerides, mg/dL	88 (67- 154)	51 (42-64)	0.002
Cholesterol, mg/dL	152 (123-179)	150 (136-184.5)	0.570
CD4, cells/mm^3	537 (247-674)	635 (546-815)	0.063

Table 3. Transient Elastography

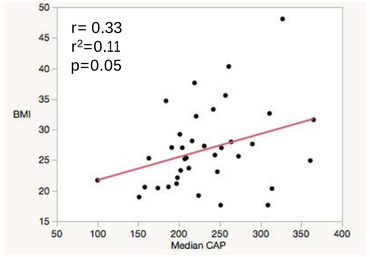
Variable	PLWHIV (n=46)	Controls (n=9)	P-Value
CAP Score, dB/m	221 (198-263)	184 (156-233)	0.063
Fibrosis, kPa	5.2 (4.1-6.4)	7.3 (3.6-8)	0.44

Data are presented as median (IQR) unless otherwise specified

- Although the mean CAP score did not differ, hepatic steatosis was present in 35% of young adults with HIV and 0% controls (p=0.03).
- In a multivariate regression including HIV status, BMI, glucose and cholesterol, cholesterol was a significant independent predictor of CAP score (p=0.007) with a trend (p=0.06) for HIV status.

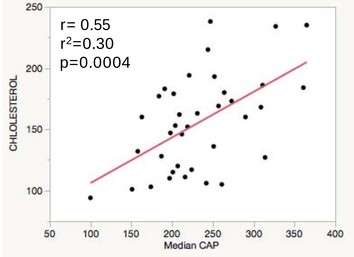
- Among those with HIV, CAP score was also positively correlated with BMI (r=0.33, p<0.05), glucose (r=0.40, p=0.01), waist circumference (r=0.42, p=0.01) and cholesterol (r=0.55, p=0.0004).
- CAP score was not related to CD4 count, viral suppression or ART duration.

Figure 1. Univariate Analysis of BMI by Median CAP score



BMI is measured in kg/m^2 and CAP score is measured in dB/m

Figure 2. Univariate Analysis of Cholesterol by Median CAP score



Total Cholesterol is measured in mg/dL and CAP score is measured in dB/m

- Four patients LWHIV exhibited elevated total cholesterol levels (fasting > 200 mg/dL), however these patients were not on lipid lowering medication.

CONCLUSIONS

- Our study is the first to demonstrate increased rates of hepatic steatosis in young adults with life-long HIV.
- Hepatic steatosis was noted in association with modifiable metabolic disturbances including dyslipidemia and increased BMI.
- The strong relationship between cholesterol and hepatic steatosis underscores the importance of recognition and appropriate treatment of hyperlipidemia, which may be a substantial contributor to NAFLD in this population.
- Larger, well matched cohorts and longitudinal follow-up are needed to better understand the role of HIV in this phenomenon and to pursue strategies targeting associated metabolic risk factors.

References:
1. Ahn JM, Paik YH, Min SY, et al. Relationship between controlled attenuation parameter and hepatic steatosis as assessed by ultrasound in alcoholic or nonalcoholic fatty liver disease. Gut Liver 2016;10:295–302.
2. http://asp-indus.secure-zone.net/v2/index.jsp?id=955/1197/4412