Long-term LDL-cholesterol Trajectories in Virologically Suppressed HIV Patients: Effect of Liver Fibrosis And Statin Use.

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Abstract #2139

Introduction

HIV infection and initiation of highly active antiretroviral therapy (HAART) alter low-density lipoprotein- cholesterol (LDL-c). HIV infection is also associated with increased incidence and progression of liver fibrosis even in the absence of hepatitis C (HCV) co-infection.
However, it is unclear whether liver fibrosis modifies LDL-c serum levels over time and whether the anti-inflammatory effect of statins protects against fibrosis progression.

Methods

- We used the US VA HIV Clinical Case Registry to generate a medication exposure model for HAART and statins.
- We identified all HCV-negative patients who initiated HAART after 1/1/2003.
- We selected LDL-c and FIB-4 values recorded during periods of viral suppression (HIV-1 RNA<500 copies/mL) and HAART use ratio >80% (days on HAART/days since HAART initiation).
- We fit fractional polynomials curves stratified by FIB-4 category and current statin use at the time of LDL-c measurement.
- We used multilevel linear regression to assess the effect of FIB-4 on LDL-c over time adjusting for age, time since HAART initiation, initial LDL-c level, sex, race, statin prescription and CD4 count.
- We used the same methods to assess the effect statin use ratio quartiles on FIB-4 score among statin users adjusting for LDL-c, age, time since HAART initiation, sex, race, and CD4 count.

Results

The analysis included 6128 individuals with an average of 4.5 LDL-c measurements per person.

	FIB-4 <1.45 (N=4300)	FIB-4: 1.45-3.25 (N=1661)	FIB-4: >3.25 (N=167)
Age at HAART initiation	47 (40, 54)	57 (51, 63)	59 (52, 64)
% Male	97	99	98
Race (% AA/White)	41/47	35/53	32/54
% Ever use of statins	41	52	41
Cum. Days on HAART	217 (95, 476)	211 (90, 489)	223 (90, 547)
Current CD4	459 (301, 638)	399 (262, 561)	337 (186, 508)
LDL cholesterol	110 (88, 133)	104 (83, 129)	94 (75, 120)
HDL cholesterol	40 (34, 50)	41 (34, 52)	38 (28, 50)
Triglycerides	152 (103, 232)	150 (100, 236)	149 (93, 217)

Table 1: Population Characteristics

Results

LDL Trajectories on HAART

Overall, LDL-c decreased by 0.6 mg/dl with each additional year on HAART (Table 2). Higher FIB-4 was associated with lower LDL-c over time regardless of statin use (see Figures 1 and 2).

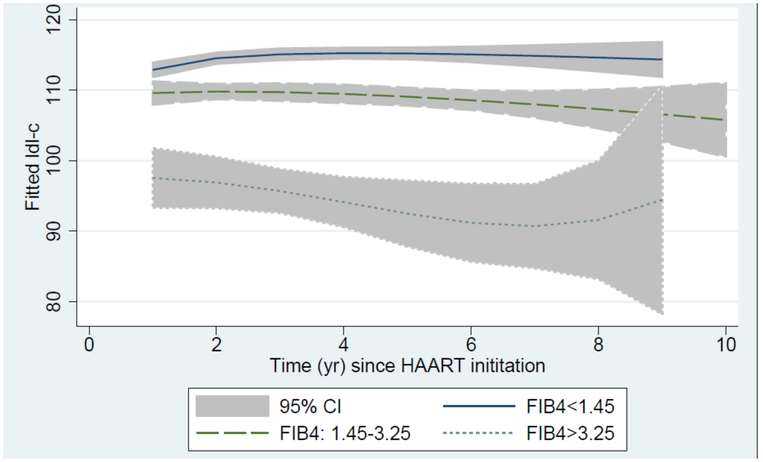

Figure 1: LDL-c After HAART Initiation; Patients Not on Statins

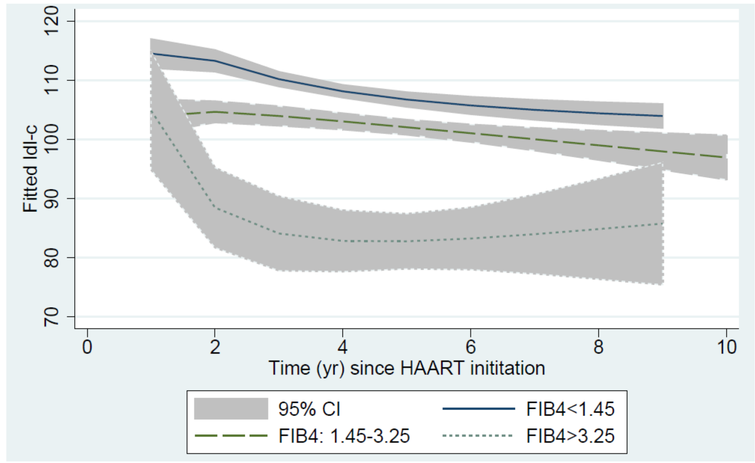

Figure 2: LDL-c After HAART Initiation; Patients On Statins

Results

Compared to those with FIB-4<1.45, average LDL-c was 8 mg/dL lower in patients with FIB-4>3.25 (advanced fibrosis), and 2.5 mg/dL lower in those with FIB-4 between 1.45-3.25.

	Beta coefficient (95% CI)
FIB-4<1.45	1 (Ref)
FIB-4 1.45-3.25	-2.53 (-3.31, -1.75)
FIB-4 >3.25	-7.85 (-9.83, -5.86)
First eligible LDL-cholesterol after HAART initiation	0.69 (0.67, 0.7)
Age at HAART initiation	0.11 (0.06, 0.15)
Years after HAART initiation	-0.57 (-0.73, -0.41)
Race	
Unknown Race	1 (Ref)
African American	0.16 (-1.48, 1.81)
White	1.33 (-0.26, 2.93)
Statin use at time of LDL measure	-15.6 (-16.4, -14.81)

Table 2: Association of FIB-4 score and LDL-cholesterol

Statin use ratio was not linearly associated with FIB-4 over time regardless of initial LDL-c.

Statin Utilization Ratio (Quartiles)	Beta coefficient (95% CI)
1 (Lowest Use)	1 (Ref)
2	-0.018 (-0.056, 0.019)
3	-0.004 (-0.048, 0.041)
4 (Highest Use)	-0.002 (-0.050, 0.055)

Table 3: Association of Statin Use and FIB-4 among 2714 statin users

Conclusions

- Among HIV-infected patients with suppressed viremia on stable HAART, LDL-c declined over time regardless of statin use and the decline was greater in those with higher liver fibrosis score.
- FIB-4 score changes did not differ linearly by statin use categories.

References

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Rhoads MP, et al. HIV Med. 2006 Jan;7(1):16-24