

Effects of Pitavastatin on Lipid Profiles in HIV-infected Patients with Dyslipidemia and Receiving Atazanavir/Ritonavir: A Randomized, Double-blind, Crossover Study

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Background: Dyslipidemia as a risk factor of cardiovascular disease (CVD) is common especially in HIV-infected patients who are using protease inhibitors (PIs) including atazanavir. Adding lipid-lowering agents has proved higher efficacy in antiretroviral drugs (ARVs)-associated dyslipidemia management than that of switching therapy from PIs to other classes of ARVs. Pitavastatin is a good option to use in HIV-infected patients due to the unique characteristic of lesser drug-drug interactions and demonstrable efficacy in decreasing lipid levels in non HIV-infected individuals.

Material/methods: This study was a randomized, double-blind, crossover study comparing the safety and efficacy of pitavastatin versus placebo in HIV-infected patients with dyslipidemia and receiving atazanavir/ritonavir. Patients were randomized to receive either placebo or pitavastatin for 12 weeks, underwent a 2-week washout period, and then were given the other treatment for an additional 12 weeks. Patients were observed for lipid profiles including total cholesterol (TC), triglyceride (TG), low density lipoprotein (LDL) and high density lipoprotein (HDL); and the side effects including serum aspartate aminotransferase (AST), alanine aminotransferase (ALT) and creatine phosphokinase (CPK). The follow-up visits were every 4 weeks until the end of the study.

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Results

Table 1. Baseline Characteristics of 24 HIV-infected Patients

Characteristics	n=24
Mean (SD) age, years	48.1 (1.8)
Male, n (%)	14 (58.3)
Underlying conditions, n(%)	
• No	12 (50)
• Hypertension	2 (8)
• Chronic HBV infection	3 (12.5)
• Chronic HCV infection	1 (4.2)
• Others	2 (8)
CVD risk factors*, n (%)	
• <2	18 (75)
• ≥2	6 (25)
Mean (SD) baseline CD4, cells/mm ³	680 (189)
Mean (SD) baseline HIV viral load <40 copies/mL	24 (100)
Median (IQR) duration of ATV/r use, months	36 (24-48)
ARV regimens combined with ATV/r, n (%)	
• TDF/FTC	6 (25)
• TDF/3TC	5 (20.6)
• AZT-based regimens	8 (33.3)
• ABC-based regimens	3 (12.5)
• Others	2 (8.3)

*CVD risk factors composed of current smoking, systolic blood pressure (SBP) ≥140 mmHg or on antihypertensive drugs, HDL <40 mg/dL, first-degree relative <55 years in male and <65 years in female, and age >45 years in male or >55 years in female

Figure 1. Mean TC from Baseline to Week 12 of 24 HIV-infected Patients

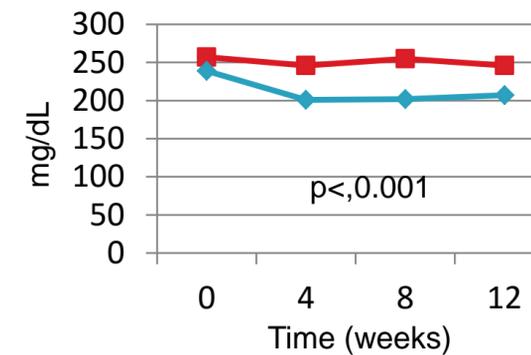


Figure 2. Mean LDL from Baseline to Week 12 of 24 HIV-infected Patients

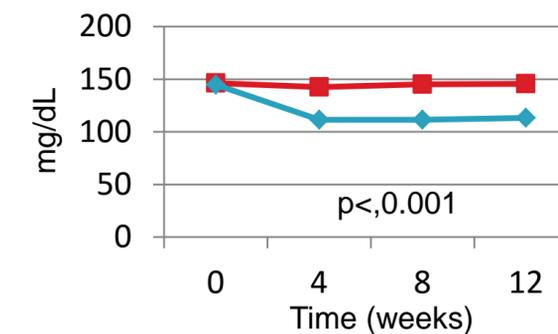


Figure 3. Median TG from Baseline to Week 12 of 24 HIV-infected Patients

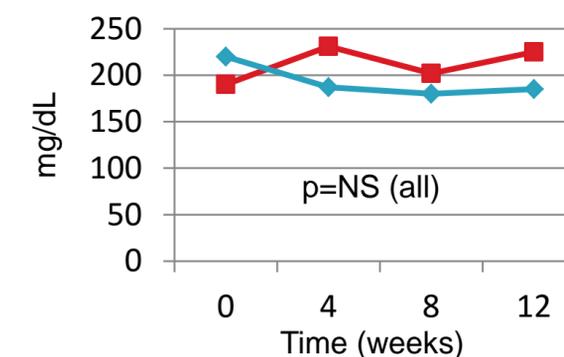
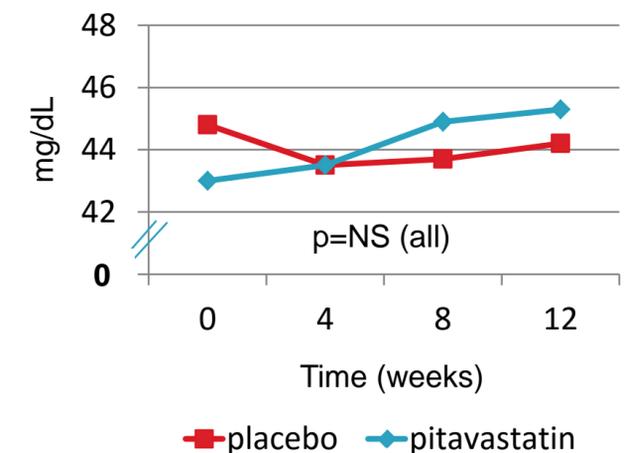


Figure 4. Mean HDL from Baseline to Week 12 of 24 HIV-infected Patients



Results: Compared with baseline, after 12 weeks of treatment with pitavastatin; mean (SD) TC was 239.9 (38.9) mg/dL vs 207 (49.1) mg/dL ($p < 0.001$); median (IQR) TG was 220 (83-1312) mg/dL vs 185 (66-4027) mg/dL ($p = 0.269$); mean (SD) HDL was 43 (10.8) mg/dL vs 45.3 (13.2) mg/dL ($p = 0.354$); and mean (SD) LDL was 144.7 (38.1) mg/dL vs 113.2 (29.8) mg/dL ($p < 0.001$). Median liver enzyme and creatine phosphokinase (CPK) levels were not statistically significant between receiving placebo vs pitavastatin at 12 weeks treatment period.

Conclusions: Pitavastatin decreases total cholesterol and LDL level at 12 weeks significantly and shows indifferent in hepatotoxicity and CPK levels compared to placebo. Thus, pitavastatin can be an option of lipid-lowering agent in HIV-infected patients who are receiving ATV/r.



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