ANTIRETROVIRAL REGIMENS ARE ASSOCIATED WITH COGNITIVE FUNCTION IN PEOPLE WITH HIV

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BACKGROUND

- While modern antiretroviral therapy (ART) is highly effective and safe overall, ART medications can cause neuropsychiatric adverse effects (e.g., poorer cognition).
- We developed a novel statistical approach to examine the relationship between common ART regimens and cognition in people with HIV (PWH).

METHODS

- We leveraged longitudinal data collected between 2014-2020 from PWH enrolled in CHARTER, NNTC, or NeuroHIV cohorts at UCSD with available ART regimen data concurrent with comprehensive neuropsychological (NP) testing.
- Novel Bayesian machine learning methods building upon a subset-tree kernel approach were developed to estimate the combined effects of ART regimens on NP performance after controlling for relevant covariates.

Table 1. Selected baseline characteristics of the study sample

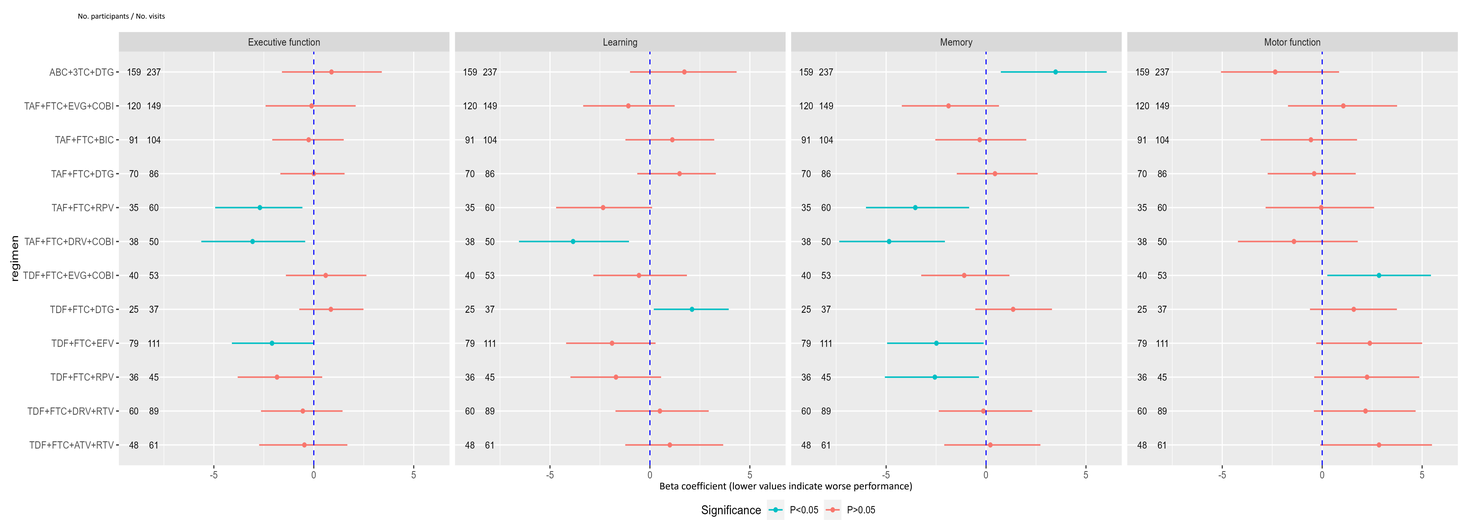
Characteristic	Value
Age, mean (SD)	54.3 (10.9)
Race, n (%)	
Black	277 (26%)
Non-black	795 (74%)
Ethnicity, n (%)	
Hispanic	266 (25%)
Non-Hispanic	806 (75%)
Highest level of education: complete high school, n (%)	854 (80%)
Diabetes: yes, n (%)	201 (19%)
Current CD4 (cells per mm^3), median (IQR)	552 (420)
Body Mass Index, mean (SD)	27 (6.7)
Gender, n (%)	
Female	301 (28%)
Male	771 (72%)
Depression, yes, n (%)	326 (30%)

Specific antiretroviral regimens are associated with worse domain-specific cognitive function in people with HIV

RESULTS

- Among 1,072 participants who participated in 1,928 (mean 1.8) visits, the most common ART regimens used were: 1) dolutegravir (DTG)+abacavir (ABC)+lamivudine (3TC) at 22%, 2) elvitegravir (EVG)+cobicistat (COBI)+tenofovir alafenamide (TAF)+emtricitabine (FTC) at 14%; and 3) efavirenz (EFV)+tenofovir disoproxil fumarate (TDF)+ FTC at 10%.
- Darunavir (DRV)+COBI+TAF+FTC was associated with worse executive function, learning and memory, while no association was observed with other protease inhibitors.

Figure 1. Combined effects of different antiretroviral regimens on domain-specific cognitive function.



All models controlled for: study enrollment site, age, sex, race/ethnicity, exposure time of antiretroviral drugs, CD4 count, body mass index, diabetes, depression, and undetectable viral load.

ABC: abacavir, 3TC: lamivudine, FTC: emtricitabine, TAF: tenofovir alafenamide, TDF: tenofovir disoproxil fumarate, EFV: efavirenz, RPV: rilpivirine, ATV: atazanavir, DRV: darunavir, RTV: ritonavir, COBI: cobicistat, EVG: elvitegravir, DTG: dolutegravir, BIC: bictegravir.

RESULTS (CONTINUED)

- Rilpivirine (RPV)+TAF+FTC and EFV+TDF+FTC were associated with poorer executive function and memory without effects on learning.
- DTG+TDF+FTC, DTG+ABC+3TC, and EVG+COBI+TDF+FTC were associated with better learning, memory, and motor function, respectively.

CONCLUSIONS

- Specific ART regimens are associated with worse domain-specific cognitive function.
- Tenofovir (including TAF or TDF) and FTC were common in such regimens in combination with either DRV+COBI, RPV, or EFV.
- Our findings suggest complex associations between ART regimens and cognition.
- Future studies should consider the effect of complete drug regimens when assessing the risk of long-term neuropsychiatric complications of ART, with attention to the highlighted drug combinations.

CONTACT INFORMATION

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