PREDICTED IMPACT OF ART SWITCH ON BODY MASS INDEX AMONG WOMEN WITH HIV

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593

BACKGROUND

- Newer antiretroviral therapy (ART) has been associated with increased body mass index (BMI) in women with HIV (WWH).
- Studies are ongoing to examine whether switching ART impacts ART-associated BMI increases.
- We developed novel machine learning approaches using data from the Women's Interagency HIV Study (WIHS) to determine the contribution of ART on BMI in virally-suppressed WWH.
- We also demonstrated the clinical utility of these models by predicting the optimal ART regimen to achieve a ≥5% decrease in BMI for WWH.

METHODS

- Analyses included virally-suppressed (HIV RNA <20 copies/ml) WWH who had visits between 2014-2019.
- We assessed factors (sociodemographic, behavioral, clinical) associated with BMI after adjusting for historical use of ART using data available since enrollment.
- Bayesian machine learning models were developed to estimate the combined effects of different ART regimens on BMI (data from 2014-2019 included in models).
- Based on the model estimates, we predicted BMI for each woman using acceptable ART regimens from the current DHHS ART guidelines, and compared the predicted BMI with the BMI at their last visit. We then determined the ART regimen that led to BMI reduction of ≥5%.

	N=1532
Age in years (Mean, SD)	48 (9.1)
Race/ethnicity:	
White(Non-Hispanic)	167 (11%)
African-American (Non-Hispanic)	1096 (72%)
Hispanic	221 (14%)
High school completion	1041 (68%)
Annual household income <= $12,000	786 (51%)
Recent marijuana use	292 (19%)
Recent crack, cocaine, and/or heroin	104 (7%)
Recent tobacco use	571 (37%)

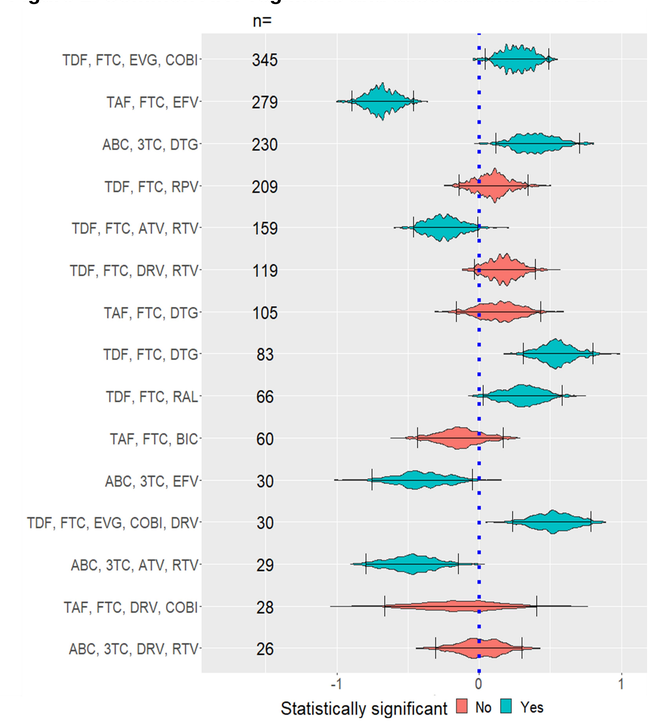
Using a predictive model, switching from current ART was not predicted to achieve a ≥ 5% decrease in body mass index in the majority of Women with HIV

RESULTS

- Data from 1,532 WWH were included. Older age, depressive symptoms, enrollment at Washington DC site and current recreational drug and tobacco use were associated with lower BMI; while African American race, diabetes, higher CD4 T cell count, as well as enrollment at Jackson Mississippi and Birmingham, Alabama sites were associated with higher BMI.
- From the 15 most common ART combinations (≥25 women/ regimen [range 26-345 women)), five ART combinations were associated with increased BMI and four with decreased BMI (**Figure 1**).
- Using the predictive algorithm, of the 1412 women who had data from more than one visit available in the timeframe of interest, a switch in ART was not associated with a predicted BMI decrease of ≥5% in 74% of WWH.
- Of the 368 WWH predicted to achieve ≥5% BMI decrease following switch, two regimens accounted for 97% of the optimal predicted ART regimens - TAF/emtricitabine(FTC)/EFV (53%) and TAF/FTC/atazanavir/ritonavir (44%) although other factors may preclude the selection of these regimens in current practice.
- A switch in BMI category from obese to overweight/healthy or overweight to healthy was predicted in 10%.

RESULTS

Figure 1. Common ART regimens and associations with BMI



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

CONCLUSIONS

- We identified ART and non-ART factors associated with BMI change in WWH.
- However, only a quarter of the women were predicted to achieve ≥5% decrease in BMI following ART switch.
- Optimization of other clinical factors may need to be implemented to achieve reductions in BMI among WWH.

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