Integrase Strand Transfer Inhibitors are Associated With Weight Gain in Women

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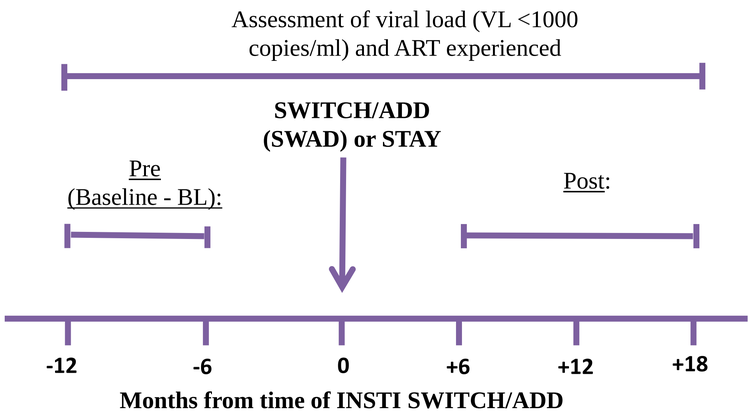
Background

- Integrase strand transfer inhibitor (INSTI)-based antiretroviral therapy (ART) is recommended first line for HIV treatment[1].
- Studies have suggested individuals who switch to INSTI-ART experience increases in body weight[2,3].
  - Limitations: Small sample size, Predominately male cohorts, Measurement of only body weight and body mass index.
- Evaluated the effect of INSTI use in women living with HIV (WLHIV).

Methods

Data utilized from Women's Interagency HIV Study[4] (WIHS) : 2008-2017.

Study Design:



Statistical Analysis:

- BL demographic and clinical characteristics were compared.
- Outcome Variables:
  - Body Weight (BW)
  - Body Mass Index (BMI)
  - Percentage Body Fat (PBF)
  - Body Circumference Measurements (BCM)
  - Systolic and Diastolic Blood Pressure (SBP , DBP)
- Linear regression models compared change over time in each outcome by STAY/SWAD, adjusted for age, race, WIHS site, education, income, smoking status, and baseline ART regimen.
- Changes in outcomes were also stratified by INSTI type (dolutegravir or raltegravir/elvitegravir) and baseline BMI.

Results

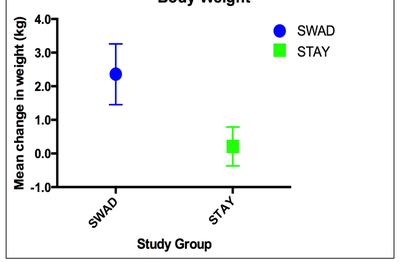
- 1118 WIHS participants:
  - -884 STAY
  - -234 SWAD
- Mean follow-up : 2.0 (SD 0.1) yrs
- No differences in baseline demographics or clinical characteristics
  - -Mean age : 48.8 (SD 8.8) yrs
  - -61% African American
  - -Mean CD4 : 669 (SD 294) cells/mm^3
- At baseline, SWAD group was more likely to be on protease inhibitor-ART (69% vs. 46%, p<0.0001)

Table 1: Model-adjusted change over time in outcome variables in SWAD and STAY groups

Mean Outcome Variable	Difference Between Means, SWAD-STAY (95% CI)
Weight (kgs)	+2.14 (1.21, 3.08)****
BMI (kg/m^2)	+0.78 (0.42, 1.14)****
Pecentage Body Fat (%)	+1.35 (0.49, 2.22)**
Body Circumference Measurements (cm)	
Waist	+2.05 (1.06, 3.04)****
Hip	+1.87 (0.99, 2.75)****
Arm	+0.58 (0.25, 0.91)***
Thigh	+0.98 (0.39, 1.56)**
Systolic BP (mmHg)	+2.24 (0.14, 4.35)*
Diastolic BP (mmHg)	+1.17 (0.05, 2.29)*

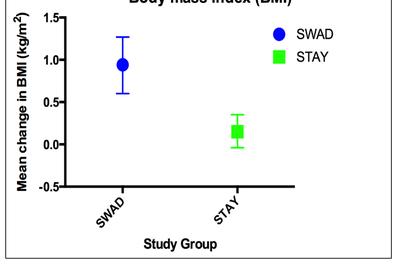
* P<0.05, **P<0.01, ***P<0.001, ****P<0.0001

Figure 1. Model-adjusted Change over Time for Body Weight



SWAD group had larger gains in body weight compared to STAY: 2.36 (CI 1.45, 3.26) kg vs. 0.21 (CI -0.37, 0.79) kg.

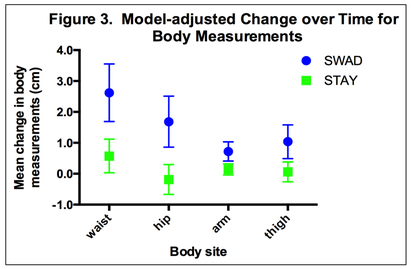
Figure 2. Model-adjusted Change over Time for Body mass index (BMI)



SWAD group had larger gains in BMI compared to STAY: 0.94 (CI 0.60, 1.27) kg/m^2 vs. 0.15 (CI -0.04, 0.35) kg/m^2.

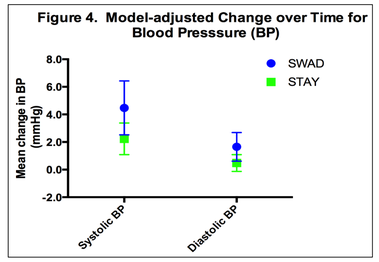
Results

Figure 3. Model-adjusted Change over Time for Body Measurements



SWAD group had larger gains in BCM compared to STAY: Waist Circumference 2.62 (CI 1.69, 3.55) cm vs. 0.57 (CI 0.03, 1.12) cm.

Figure 4. Model-adjusted Change over Time for Blood Presssure (BP)



SWAD group had larger gains in BP compared to STAY: SBP 4.47 (CI 2.52, 6.43) mmHg vs. 2.23 (CI 1.09, 3.38) mmHg.

Summary and Conclusions

- In a longitudinal study of WLHIV women on ART, a switch to INSTI was associated with significant increases in body weight, body mass index, percentage body fat, body circumference measurements, and blood pressure compared to those remaining on non-INSTI ART.
- Given the long term impact of obesity and weight gain such as cardiovascular disease, diabetes, peripheral disease, stroke, and death [5-7], further research is imperative to:
  - –Illuminate mechanism of sex-specific differences and drug pharmacology
  - –Investigate changes in additional metabolic outcomes such as lipid and glycemic profile
  - –Determine prevention strategies
  - –Create management plans for metabolic effects associated with INSTI use

Literature Cited:
[1]Park TE, et. al. Expert review of anti-infective therapy. 2015;13(10):1195-212. [2]Norwood J, Turner M, et al. Journal of acquired immune deficiency syndromes. 2017 Aug 18. [3]Menard A, et al. Aids. 2017 Jun 19;31(10):1499-500. [4]Barkan SE, et al. Epidemiology, vol. 9, no. 2, 1998, pp. 117–125. [5]Ho JS, et. al. Am J Cardiol. 2008;102:689 – 692. [6]Zhao D, et. al. Am J Cardiol. 2007;100:835– 839. [7]Malik S, et. al. Circulation. 2004;110:1245–1250

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