

# Exploring the Prevalence and Characteristics Associated with Weight Gain and Metabolic Changes in PLWH who are Virologically Suppressed on Antiretroviral Therapy and Switch to Integrase Inhibitor Containing Regimens

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## Background

- Virologically suppressed patients living with HIV infection (PLWH) gain weight when they switch antiretroviral therapy (ART) to integrase inhibitor (INSTI) containing regimens
- The prevalence, extent and characteristics associated with weight gain when switching to INSTIs remains unknown.
- It is also unclear whether patients who experience weight gain also experience other metabolic changes

## Objectives

- To determine the prevalence, extent and characteristics of weight gain among virologically suppressed PLWH whose ART has been switched to an INSTI-containing regimen
- To examine the presence of metabolic changes in PLWH who have been switched to INSTI-containing ART

## Methods

- Observational, retrospective chart review of PLWH at a single academic medical center from May 2015 to December 2017
- Eligible patients had been virally suppressed on a non-INSTI-containing ART regimen for at least 1 year before switching to INSTI-containing ART
- Body weight, cholesterol and A1C values were collected for the year prior to and 18 months following the switch
- Pre and post-switch median values of each parameter were calculated and compared using the Wilcoxon signed-rank test
- Predictors of weight gain were determined with simple linear regression

## Limitations

- Single-centered study design could limit external validity
- Patients' medical records may be incomplete and inaccurate
- Patients had varying numbers of weight values at varying time points

## Results

**Table 1: Patient Characteristics**

Characteristic	All (n = 90)
Mean Age - Years (range)	49.5 (28-75)
Male Sex, n (%)	75 (83)
Race, n (%)	
African American	49 (54)
Caucasian	30 (33)
Mean Years since HIV diagnosis (range)	12.9 (2-30)
Mean Number of Previous Regimens (range)	1.7 (1-7)
Mean Years on Previous Regimen (range)	7.0 (1-21)
Pre-switch BMI category, n (%)	
Underweight	2 (2)
Normal Weight	27 (30)
Overweight	38 (42)
Obese	23 (26)
Pre-switch ART, n (%)	
PI-based	47 (52)
NNRTI-based	40 (44)
Post-switch integrase inhibitor, n (%)	
Elvitegravir	57 (63)
Dolutegravir	33 (37)

**Table 2: Unadjusted Analyses of Metabolic Parameters**

Characteristic	Pre Switch	Post Switch	Change*
Total Cholesterol (n=79)	185.0 (51.0)	185.0 (46.5)	-1.0 (47.2)
HDL Cholesterol (n=79)	48.0 (18.5)	48.0 (19.7)	1.0 (12.0)
LDL Cholesterol (n=78)	107.5 (39.5)	104.0 (37.8)	1.3 (35.0)
Triglycerides (n=79)	147.8 (135.7)	140.0 (121.0)	5.0 (68.3)
Hemoglobin A1C (n=24)	5.8 (1)	5.6 (1.4)	-0.1 (0)
ASCVD Risk Score (n=67)	6.8 (12)	7.2 (11)	0.6 (3.1)

Data displayed as medians and IQR  
 \*All p-values >0.05

**Table 3: Unadjusted Analyses of Weight Change**

Group	Pre Switch Weight	Post Switch Weight	Weight Change
Total	82.0 (18.7)	85.8 (20.5)	1.7 (4.8)*
Male	83.9 (18.7)	87.3 (21.6)	1.7 (4.7)
Female	80.2 (30.2)	81.9 (26.0)	1.7 (5.1)
African American	82.1 (24.7)	85.5 (23.2)	1.7 (5.7)
Caucasian	83.9 (16.0)	88.5 (17.6)	1.8 (3.7)
Pre-switch NNRTI	85.5 (22.0)	90.3 (24.4)	2.4 (5.6)
Pre-switch PI	80.6 (21.8)	83.3 (24.9)	1.7 (4.6)
Post-switch DTG	82.8 (17.4)	83.8 (19.5)	1.7 (5.9)
Post-switch DTG/TAF (n=7)	83.9 (19.3)	84.1 (23.9)	4.4 (6.2)
Post-switch EVG	83.9 (20.2)	87.3 (21.3)	1.7 (4.2)
Post-switch EVG/TAF (n=55)	85.1 (21.2)	87.5 (23.1)	1.6 (3.9)

Data displayed as medians and IQR  
 \*p-value <0.05

**Table 4: Simple Linear Regression Model**

Effect	Parameter Estimate	95% Confidence Interval	p value
Intercept	7.182	3.413, 10.952	
Age	-0.101	-0.176, -0.027	0.008

## Conclusions

- Patient weight increased by a median of 1.7 kg after switching and 26% of patients gained ≥ 4.5 kg
- Despite changes in weight, patients did not experience significant changes in cholesterol or A1C values
- Weight gain appeared to be more substantial in individuals switching from NNRTIs and to DTG/TAF in unadjusted analyses
- In the regression model, sex, race, pre-switch BMI, and pre- and post-switch ART were not predictors for weight gain
- Increased age was protective against weight gain in the model