

Changes in body mass index among people with HIV initiating integrase inhibitor based antiretroviral therapy: Insights from the TriNetX database

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Objective

To investigate body mass index (BMI) changes among PWH initiating INSTI vs non-INSTI regimens using the nationwide TriNetX database.

Background

- Weight gain and obesity are emerging areas of clinical concern among people with HIV (PWH)
- While some studies link weight gain to integrase strand transfer inhibitor (INSTI) antiretrovirals, this issue is complex and multifaceted with potential other contributors
- To better understand and characterize this we conducted a retrospective cohort study using the TriNetX database to identify factors associated with weight gain in PWH

Methods

- TriNetX is a database of electronic medical record data abstracted from over 50 US institutions.
- We included data from treatment naive PWH (>=18y) with available BMI measurements <30 days from and closest to 12m post ART initiation.
- Exclusion criteria included who switched between INSTI and non-INSTI regimens during follow-up, had mixed-anchor regimens or missing/mishandled data.
- We collected demographic, clinical and laboratory data as well as data on medications.
- Bivariate and multivariable generalized linear models were used to assess potential associations between INSTI use and changes in continuous BMI and weight.

Disclosure

This study was supported by Gilead Sciences.

Results

Table 1: Baseline characteristics

Variable	Overall	ART other than INSTI	INSTI	
Total N	5754	1407	4347	
Age at ART initiation, Median (IQR)	37 (29-48)	40 (31-49)	36 (28-47)	
Ethnicity N,(%)	Not Hispanic or Latino	1014 (72.1%)	3002 (69.1%)	
	Hispanic or Latino	155 (11.0%)	493 (11.3%)	
	Unknown ethnicity	238 (16.9%)	852 (19.6%)	
Race N (%)	White	520 (37.0%)	1391 (32.0%)	
	Black or African American	566 (40.2%)	1856 (42.7%)	
	Asian, Alaska Native or American Indian	40 (2.8%)	135 (3.1%)	
	Hawaiian or Pacific Islander	4 (0.3%)	6 (0.1%)	
	Race not available	277 (19.7%)	959 (22.1%)	
Sex N (%)	Male	1000 (71.1%)	3357 (77.2%)	
	Female	407 (28.9%)	989 (22.8%)	
Region, N(%)	Midwest	309 (22.0%)	294 (6.8%)	
	Northeast	190 (13.5%)	854 (19.6%)	
	South	520 (37.0%)	1913 (44.0%)	
	West	388 (27.6%)	1286 (29.6%)	
BMI at ART initiation, Median (IQR)	24.2 (21.4-28.2)	24.6 (21.6-28.4)	24.1 (21.3-28.1)	
BMI category at ART initiation N (%)	Underweight	378 (6.6%)	92 (6.5%)	286 (6.6%)
	Normal weight	2825 (49.1%)	664 (47.2%)	2161 (49.7%)
	Overweight	1545 (26.9%)	395 (28.1%)	1150 (26.5%)
	Obese	1006 (17.5%)	256 (18.2%)	750 (17.3%)
Weight (kg) at ART initiation, Median (IQR)	73.1 (63.5-86.0)	73.5 (63.6-86.2)	73.0 (63.5-85.9)	
Year of ART initiation, Median (IQR)	2017 (2015-2020)	2012 (2011- 2014)	2018 (2017-2020)	
Duration of follow-up (months from baseline BMI to follow-up BMI) Median (IQR)	11.5 (9.1-12.5)	11.7 (10.1-12.6)	11.5 (8.6-12.5)	
CD4 count at ART initiation, Median (IQR)	281 (99-470)	259 (95-416)	290 (100- 488)	
HIV viral load at ART initiation Median (IQR)	55460 (15200-205116)	41000 (8710-140000)	63096 (17200-230230)	
HIV viral load (log10) at ART initiation, Median (IQR)	4.7 (4.2-5.3)	4.6 (3.9-5.2)	4.8 (4.2- 5.4)	
Abacavir use N (%)	820 (14.3%)	146 (10.4%)	674 (15.5%)	
Tenofovir Alafenamide Use N(%)	3124 (54.3%)	147 (10.4%)	2977 (68.5%)	
Tenofovir Disoproxil Use N (%)	2747 (47.7%)	1145 (81.4%)	1602 (36.9%)	
Efavirenz Use N (%)	546 (9.5%)	546 (38.8%)	0 (0.0%)	

Results Continued

Figure 1: Trends in Antiretroviral Therapy (ART) initiation regimens and mean

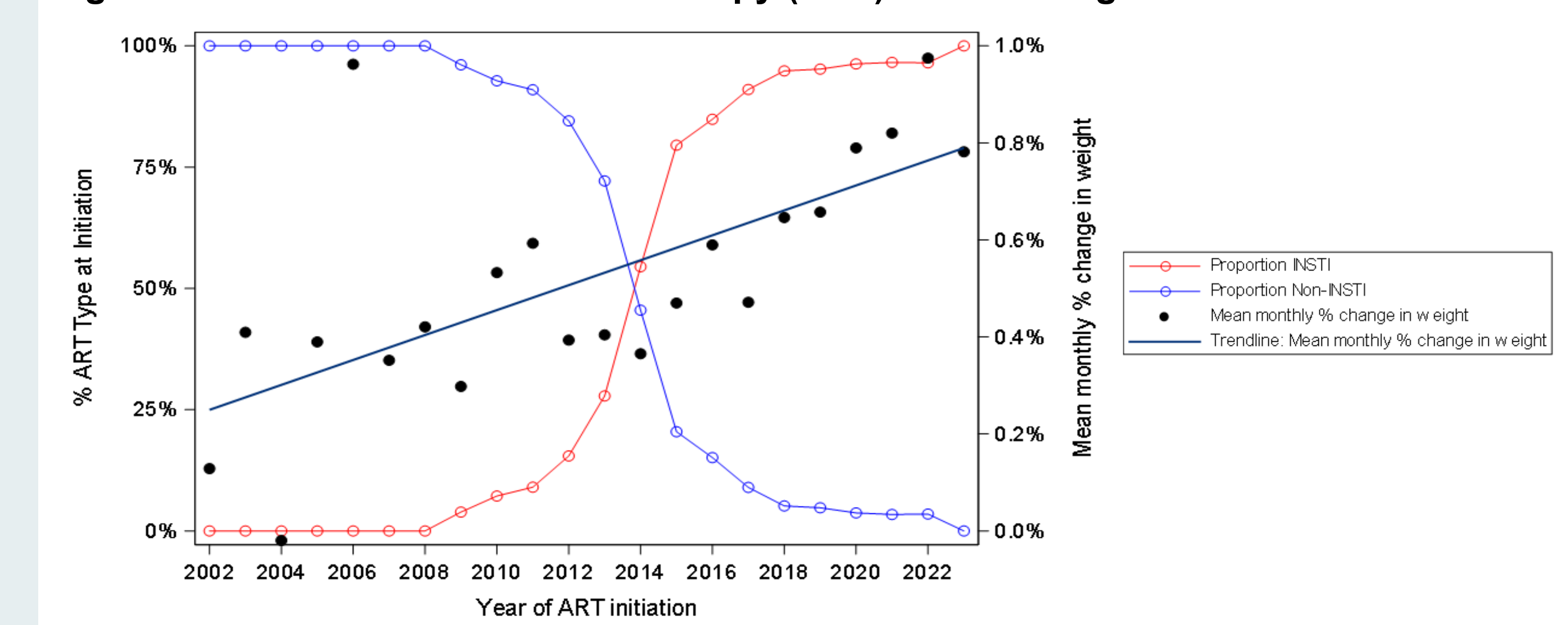


Table 2: Change in Body Mass Index; Adjusted Model

Parameter	BMI change kg/m ² (95% CI)	p-value
Age at ART initiation	0.01 (0.00, 0.01)	0.123
Ethnicity: Hispanic or Latino [ref=Non-Hispanic]	0.26 (-0.02, 0.54)	0.149
Ethnicity: Unknown [ref=Non-Hispanic]	0.16 (-0.07, 0.40)	
Race: Black or African American [ref=White]	-0.02 (-0.22, 0.17)	0.752
Race: Asian, Alaska Native, or American Indian [ref=White]	-0.26 (-0.70, 0.17)	
Race: Hawaiian or Pacific Islander [ref=White]	0.55 (-1.35, 2.45)	
Race: Not Available [ref=White]	0.00 (-0.25, 0.25)	
Sex: Female [ref=Male]	0.41 (0.22, 0.60)	<0.001
Region: Midwest [ref=South]	0.19 (-0.08, 0.46)	0.176
BMI (kg/m ²) at ART initiation	-0.04 (-0.06, -0.03)	<0.001
Year of ART initiation	0.02 (-0.01, 0.05)	0.253
Follow-up duration (months)	0.08 (0.06, 0.10)	<0.001
CD4 count at ART initiation (per 100 cells/mm ³ increments)	-0.21 (-0.24, -0.17)	<0.001
Backbone: Abacavir	-0.13 (-0.38, 0.12)	0.298
Backbone: Tenofovir Alafenamide (TAF)	0.29 (0.07, 0.52)	0.011
Backbone: Tenofovir Disoproxil Fumarate (TDF)	0.07 (-0.13, 0.26)	0.518
Efavirenz use	-0.10 (-0.42, 0.22)	0.556
ART Type: INSTI [ref=ART other than INSTI]	0.41 (0.14, 0.68)	0.003

Conclusions

INSTI use, sex, follow-up duration, and TAF use were associated with small increases in BMI. On the other hand higher baseline BMI and baseline CD4 were associated with small decreases in BMI, indicating that changes in body weight are multifactorial. Notably, we did not detect an association between TDF and EFV use and BMI changes. Future studies will compare BMI trends to non-HIV populations in order to identify HIV-specific factors contributing to weight gain in PWH.