

Body Mass Index Change In People Living With HIV During The COVID-19 Pandemic In New York

Kai-Ming Chang, MD, AAHIVS¹; Guillermo Ramirez, MD¹; Praveen Kumar Vikraman, MD¹; Lemar Nadi, MD¹; Cristina Sison, PhD²; Michael Oey, MD¹

¹Division of Infectious Diseases, Department of Medicine, Donald and Barbara Zucker School of Medicine at Hofstra/Northwell

²Biostatistics Unit, Feinstein Institutes for Medical Research, Northwell Health



INTRODUCTION

- People living with HIV (PLWHIV) suffer from adverse outcomes of metabolic syndrome. This study hypothesized that the COVID-19 pandemic, particularly with the stay-at-home status in 2020, resulted in physical inactivity and dietary changes leading to increases in weight and body mass index (BMI).
- This study aimed to document the BMI change among people living with HIV (PLWHIV) from 2017 to 2020.

METHODS

- Retrospective, single-center cohort study in suburban NY.
- Inclusion criteria: adult patients who visited HIV clinic for annual visits during September 2020 to December 2020 with a documented weight.
- Exclusion criteria: urgent visits, non-medical visits (only for injection, form request, social worker visit, etc), age less than 18, and pregnant patients.
- Data collected through electronic medical chart review.
- Data on patients' demographics, co-morbidities, and antiretroviral therapy (ART) as of 2020 and the yearly values of BMI, hemoglobin A1c, and low density lipoprotein cholesterol (LDL) from 2017 to 2020 were collected and compared. The adjusted model included age (at the first study year, 2017), sex (male vs. female), race (black vs. non-black) and use of the drug class integrase strand transfer inhibitor (INSTI-yes vs. INSTI-no).
- Repeated measures analysis of variance (RMANOVA) was carried out to examine the patterns of change in BMI over time (visit year). Both unadjusted and adjusted models were examined. P-value for significance was set at <0.05.

Table 1: Baseline characteristics of the cohort

Characteristic.	Study population, n (%)
Sex	N=256
Female	95 (37.1%)
Male	161 (62.9%)
Age	
Median	51
IQR	39.5-57.5
Height (cm)	
Median	172.46
IQR	165.1-177.8
Race	
Black	103 (40.23%)
White	102 (39.84%)
Others	49 (19.14%)
Ethnicity	
Non-Hispanic	193 (75.39%)
Hispanic	37 (14.45%)
Unknown/Not reported	26 (10.16%)
Comorbidities	
Diabetes	32 (12.5%)
Hypertension	97 (37.89%)
Cardiovascular disease	8 (3.13%)
Hyperlipidemia	55 (21.57%)
ART drug class base	
INSTI-based	162 (63.28%)
NNRTI-based	46 (17.97%)
PI-based	17 (6.64%)
Others	31 (12.11%)

Key:
ART: anti-retroviral therapy; IQR: interquartile range; INSTI: integrase strand transfer inhibitor; NNRTI: non-nucleoside reverse transcriptase inhibitors; PI: protease inhibitor

Table 2: Descriptive Statistics: BMI, A1c and LDL from 2017 to 2020 in HIV clinic in New York

	Visit year	Participants	Mean	SD	Median	IQR	Range
BMI	2017	n=215	28.19	6.32	26.89	23.78-31.32	15.17-54.21
	2018	n=232	28.44	5.95	27.13	24.57-31.35	14.85-52.13
	2019	n=245	28.57	5.91	24.47	24.48-32.36	15.98-51.94
	2020	n=256	29	6.09	27.87	24.77-32.21	14.98-53.59
A1c (%)	2017	n=177	5.71	1.07	5.5	5.3-5.8	4-11.8
	2018	n=196	5.84	1.43	5.5	5.25-5.9	4-14.1
	2019	n=199	5.78	1.27	5.5	5.3-5.8	4-14.2
	2020	n=215	5.85	1.36	5.6	5.3-5.9	4-15.5
LDL (mg/dL)	2017	n=162	108.83	35.01	107.5	85-129	24-275
	2018	n=188	105.19	36.39	101.5	80-127.5	29-231
	2019	n=200	104.19	34.87	98.5	80-127	21-252
	2020	n=205	110.09	37.88	103	85-134	35-300

Key: A1c: hemoglobin A1c; BMI: body mass index; IQR: interquartile range; LDL: low density lipoprotein cholesterol; SD: standard deviation

RESULTS (Table 1 and 2)

- Among 256 PLWHIV, mean BMI was 28.19, 28.44, 28.57, and 29.0 for the years 2017, 2018, 2019, and 2020 respectively.
- Results from both unadjusted and adjusted analyses for BMI were similar. There was a significant difference in BMI between years ($p < 0.001$), adjusting for age, sex, race and INSTI use. There were no significant differences in BMI between 2017 and 2018 ($p < 0.346$), between 2017 and 2019 ($p < 0.086$) or between 2018 and 2019 ($p < 0.467$); the mean BMI in 2020 was significantly higher than each of 2017, 2018 and 2019 (all $p < 0.001$).
- On average, females had a significantly higher BMI than males (29.69 vs. 27.58; $p < 0.0062$).
- There was no specific trend for A1c or LDL.

DISCUSSION & CONCLUSION

- Among PLWHIV in a clinic population, there was a substantial BMI increase in 2020, possibly due to the stay-at-home status in early 2020.
- In our study, age, race (black vs. non-black) and regimen (INSTI-use vs. non-INSTI use) were not significantly associated with BMI. The data suggests that the increasing trend in BMI is likely highly associated with the 2020 COVID-19 restriction measures rather than age, race or medication.
- A one-unit change in BMI may translate to a substantial weight gain, which can be meaningful.
- The effect of the pandemic on long-term cardiovascular outcomes warrants further research.

