Evaluation of the Incidence of Hypertension, Diabetes, and Hyperlipidemia in Patients on Antiretroviral Therapy

UIC COLLEGE OF PHARMACY
UNIVERSITY OF ILLINOIS AT CHICAGO

Niha Idrees, PharmD; Yu Jin Hwang, PharmD Candidate; Sabreen Arman PharmD Candidate; Razan Hendi, PharmD Candidate; Sarah Michienzi, PharmD; Mahesh Patel, MD; Scott Borgetti, PharmD; Melissa Badowski, PharmD, MPH

University of Illinois at Chicago, College of Pharmacy, Chicago, IL

UI Health | UIC

BACKGROUND

- Post-marketing studies have shown an association between integrase inhibitor (INSTI)-based regimens and weight gain.[1]
- It is unknown if INSTIs associated with long-term metabolic consequences.
- Due to uninterrupted access to ART at the Illinois Department of Corrections (IDOC), this is an ideal location to study this population

PURPOSE

To analyze the incidence of hypertension, diabetes, and hyperlipidemia in patients on INSTI-based regimens compared to NNRTI-based and PI-based regimens

METHODS

- **Study design:** retrospective cohort study
- **Time frame of chart review:** 7/11/2010 – 12/31/2019
- IRB-approved

INCLUSION CRITERIA

- Age ≥ 18 years
- Diagnosis of HIV
- Incarcerated in the Illinois Department of Corrections any time between 7/11/2010 and 12/31/2019
- Taking one of the recommended initial regimens for most PLWH for at least 1 year[2]
- EMR data available for at least one continuous year while on this regimen.

EXCLUSION CRITERIA

- Previous diabetes diagnosis
- Previous hypertension diagnosis
- Previous hyperlipidemia diagnosis
- Nuke-sparing therapy

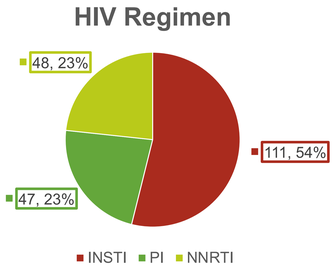
OUTCOME MEASURES

- **Primary Outcome -** incidence of at least one metabolic comorbidity (defined as hypertension, diabetes, and/or hyperlipidemia)
- **Secondary Outcomes -** incidence of weight gain, type 2 diabetes mellitus (T2DM), hypertension, and hyperlipidemia between HIV drug classes

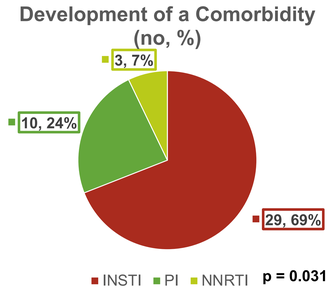
BASELINE DEMOGRAPHICS

A total of 206 patients were included with representation from all three major drug classes

	Baseline Demographics
African American, no. (%)	128 (69)
Male, no (%)	169 (91.8)
Age, years ± SD	39.1 ± 10.4
Weight, lbs ± SD	180.1 ± 35.1
BMI, kg/m^2 ± SD	26.5 ± 4.5
Undetectable HIV RNA (<200 copies/mL), no. (%)	132 (71.7)
CD4+ count >200 cells/mm^3, no (%)	188 (91)

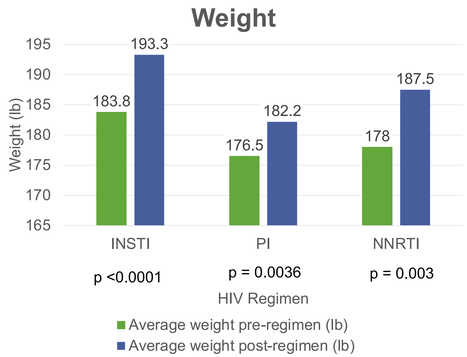


RESULTS – PRIMARY AND SECONDARY OUTCOMES

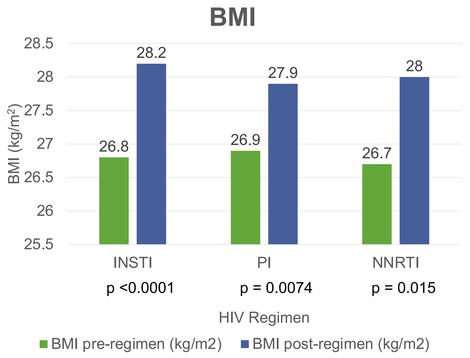


	INSTI[a] (n=111)	PI[b] (n=47)	NNRTI[c] (n=48)	p-value
Development of diabetes, n (cases per 100 patient years)	1 (0.19)	0 (0)	0 (0)	0.652
Development of hypertension, n (cases per 100 patient years)	21 (3.89)	8 (1.48)	2 (0.37)	0.027
Development of hyperlipidemia, n (cases per 100 patient years)	11 (2.04)	3 (0.55)	1 (0.19)	0.205

Patients on INSTI-based therapy developed a comorbidity (hypertension) more than the other drug classes



All ARV drug classes were linked to weight gain and increase in BMI.



STATISTICS

- Data was analyzed with ANOVA, chi-squared, and paired t-tests.
- Primary outcome was adjusted for age, race, use of antipsychotic medications, and family history of metabolic comorbidities.

LIMITATIONS

- Retrospective nature of study
- Differences in baseline characteristics for this study site compared to general population
- Changes in management of these disease states throughout this study period.

CONCLUSIONS

- Rates of weight gain and obesity have become an increasing problem in the U.S., including in patients living with HIV
- All antiretrovirals were linked to weight gain but INSTIs were associated with increased incidence of hypertension.
- Routine weight, laboratory and blood pressure monitoring for patients on INSTIs is important to monitor for metabolic abnormalities

REFERENCES

1. Bourgi K, Jenkins CA, Rebeiro PF, et al. Weight gain among treatment-naïve persons with HIV starting integrase inhibitors compared to non-nucleoside reverse transcriptase inhibitors or protease inhibitors in a large observational cohort in the United States and Canada. *J Int AIDS Soc.* 2020, 23(4):e25484
2. Goldberg RN, Kania AT, Michienzi SM, Patel M, Badowski ME. Weigh Gain in Incarcerated Individuals living with HIV After Switching to Integrase Strand Inhbitor-Based Therapy. J Int Assoc Provid AIDS Care. Jan-Dec 2021;20:2325958221996860.
3. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents with HIV. Department of Health and Human Services. Accessed Sep 20, 2021.

Contact Information:
Niha Idrees, PharmD
840 S Wood St
Chicago, IL, 60612
Office: 312-996-2236 Email: nidrees@uic.edu