The Impact of Race and HIV Status on Diabetes among Older Adults

C. O. Onyango[1, 2], A. W. Capuano[2], B. D. James[2], C. M. Glover[2], and R. C. Shah[2]

1 Xavier University of Louisiana, 2 Rush Alzheimer's Disease Center, Rush University Medical Center

RUSH UNIVERSITY MEDICAL CENTER

Background:

- Human immunodeficiency virus (HIV) is an illness that attacks, infects, and ultimately destroys immune cells and an estimate of 1.2 million Americans are living with HIV.[1]
- Diabetes is a condition that impairs production of insulin which results in atypical metabolism of carbohydrates and elevated levels of glucose in the blood and urine. Within the United States in 2012 10% of the population had diabetes.[2]
- Racial/ethnic minority groups have higher chances of having HIV[3] and diabetes[4] than Non-Hispanic Whites.
- HIV Antiviral Therapy (ART) medications can increase the chance of developing diabetes. Screening for HbA1c in HIV(+) may increase the chance of given a false negative when it comes to diagnosing diabetes.[5]
- To our knowledge, very few studies examine the role of race and HIV status on diabetes.

Objective:

- The purpose of this study is to understand how race and HIV status, separately, are associated with history of diabetes among older adults.
- A secondary aim of this study is to examine the association of gender and age at baseline on the history of diabetes among older adults.

Methods:

- Centers of Excellence on Disparities in HIV and Aging Cohort: Total population of the of 371 people were sampled. 255 Blacks, 116 Whites, 177 HIV(+), and 194 HIV(-) were sampled.
- Ethics: The CEDHA Research Core was approved by the Rush University Medical Center Institutional Board.
- Variable:
  --HIV= Status was determined by blood test
  --Race= "Which race group do you closely identify yourself?"; 1= "White" or 2= "Black"
  --Diabetes= "Have you ever been told by a doctor, nurse or therapist that you had diabetes, or sugar in your urine, or high blood pressure?"; "1= yes"* or 3= "no"
  --Gender= "What gender do you identify yourself?"; "Male= 1" or "Female= 0"
  --Age= Calculated from date of birth (DOB) and date of interview
  --Education: 0-8= "Elementary" or 9-12= "High school" or 13-16= "College"

Statistics:

➔Statistical analysis compared demographic and clinical characteristics of HIV(+) and HIV(-) people using *t*-tests for continuous variables and chi-square test for categorical variables. Odds ratio of diabetes were ascertained, along with confidence intervals. Potential cofounders were identified.

➔Statistical tests were two-sided and statistical significance level of α=0.05.

References:

1. Lanier, Y., & Sutton, M. Y. (2013). Reframing the Context of Preventive Health Care Services and Prevention of HIV and Other Sexually Transmitted Infections for Young Men: New Opportunities to Reduce Racial/Ethnic Sexual Health Disparities. *American Journal of Public Health*, *103*(2), 262–269. http://doi.org.ezproxy.rush.edu/10.2105/AJPH.2012.300921
2. Ferdinand, K. C., Nasser, S. A. (2015). Racial/ethnic disparities in prevalence and care of patients with type 2 diabetes mellitus. Current Medical Research and Opinion, 31(5), 913-923.
3. Gaskin, D. J., Thorpe, R. J., McGinty, E. E., Bower, K., Rohde, C., Young, J. H., … Dubay, L. (2014). Disparities in Diabetes: The Nexus of Race, Poverty, and Place. *American Journal of Public Health*, *104*(11), 2147–2155. http://doi.org.ezproxy.rush.edu/10.2105/AJPH.2013.301420
4. Kann, L., McManus, T., Harris, W. A., Shanklin, S. L., Flint, K. H., Queen, B., … Ethier, K. A. (2018). Youth Risk Behavior Surveillance — United States, 2017. *MMWR Surveillance Summaries*, *67*(8), 1–114. http://doi.org.ezproxy.rush.edu/10.15585/mmwr.ss6708a1
5. Monroe, A. K., Glesby, M. J., Brown, T. (2015). Diagnosing and managing diabetes in HIV-infected patients: current concepts. Clinical infectious diseases, 60(3), 453-462.

* "Maybe" was combined with "yes"

Results

Table 1: Table 1: Characteristics of older adults from the CEDHA cohort study by HIV status (N= 371)

Characteristics N (%) or mean (SD)	HIV(+) n= 177	HIV(-) n= 194
Males	134 (75.71%)	138 (71.13%)
Females	42 (23.73%)	55 (28.35%)
Blacks	124 (70.06%)	131 (67.53%)
Whites	53 (29.94%)	63 (32.47%)
Age mean	58.71 (5.46)	58.90 (6.80)
Education mean	13.19(2.83)	13.57 (2.96)
Diabetes	28 (15.82%)	39 (20.10%)
No Diabetes	149 (84.18%)	155 (79.10%)

* Statistically different using *t*-test.
**Significantly different using chi-square test.

Table 2: Association between HIV status, race, and gender, separately, on the prevalence of diabetes using confidence interval and odds ratio

Variable	Proportion of diabetes	Odds ratio of diabetes		
	Proportion	Estimate	Lower CI	Upper CI
HIV(+) n= 177	15.8%	0.747	0.437	1.276
HIV(-) n= 194	20.1%	reference		
Blacks n= 255	17.3%	0.843	0.481	1.476
Whites n= 116	19.8%	reference		
Males n= 272	16.9%	1.527	0.8677	2.687
Females n= 97	20.6%	reference		

- There was no significant difference in diabetes between Blacks and Whites (Table 2).
- Participants with diabetes were 2.14 years older than others (t(df=369)=2.59, p=0.01), but age was not significantly different between HIV+ and controls.
- There was no confounding of age and gender.

Conclusion

- No significant differences were found for race and HIV status and the odds of having history of diabetes
- However participants who were older were more likely to have had history diabetes than those who were younger.
- To our knowledge, very few studies examine the role of race and HIV status on diabetes among older adults.
- Limitations within the research were potential volunteer bias, potential survivor bias, self report bias and the CEDHA cohort was not representative of the U.S. population.
- More research should be done on the association of race, HIV status, and diabetes.

Acknowledgements: Support for this work was provided by the NIH (P20MD006886, Barnes LL; and, P30AG010161, Bennett DA).
We thank the CEDHA Research Core participants.