

Type 2 Diabetes (T2D) Among Persons Living with Human Immunodeficiency Virus (HIV): A Tale of Co-Morbidity

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BACKGROUND

In the United States approximately 1.2 million people are living with HIV (PLWH)[1]. Among PLWH, aging of the population, length of time on antiretroviral therapy (ART) and obesity associated with treatment has led to increased prevalence of type 2 diabetes (T2D). Depression among PLWH is 39-49% and 23-49% among person with T2D [2,3]. It is unclear whether people with both conditions experience greater severity of depression than those living with T2D alone and if co-morbid conditions result in worse glycemic outcomes.

AIMS

1. Determine the prevalence of T2D among persons living with HIV (PLWH)
2. Determine the prevalence of depression among PLWH & T2D
3. Determine the impact of depression and HIV symptoms on glycemic outcomes (A1c & blood glucose)

METHODS

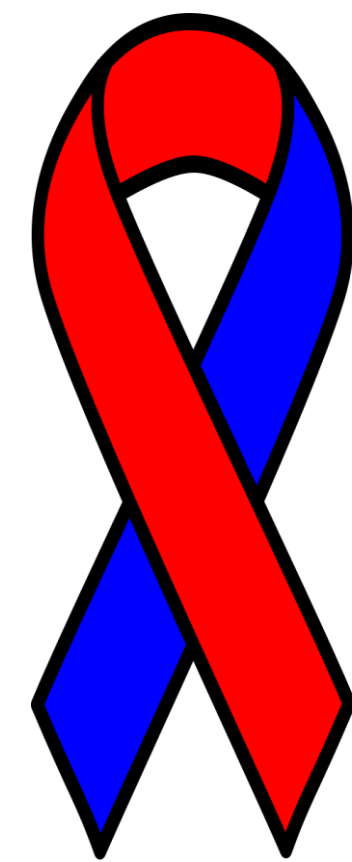
Retrospective study conducting secondary analysis of data from a diverse population of HIV -infected persons across 10 CNICS sites including: validated outcomes, demographics, medications, labs, diagnosis, mortality, longitudinal resistance data and patient reported outcomes. Repeated measures analysis with linear mixed models were used to compare PHQ-9 and HIV symptom scores between PLWH with/without T2D and examine differences over time.



Diabetes



HIV



Diabetes and HIV

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RESULTS

Among PLWH 16% developed T2D (Table 1), with higher prevalence among females compared to males (21.57% vs 14.26%) (Table 2), Transgender FTM had a higher prevalence compared to MTF (11.1% vs 9.8% p 0.014). Persons with T2D were 4.5 years older than their counterparts without diabetes (p<0001). Among PLWH completing PHQ-9 surveys, 32% reported moderate (17%) to severe (15%) depression (Figure 1). PLWH and T2D had lower mean PHQ-9 scores at baseline (6.148 vs 6.746, p<.0001). Those with T2D also had lower scores at midpoint of follow up (p 0.143). Persons w/T2D had slightly higher HIV symptom scores (Table 2). A 1-point increase in PHQ-9 scores was associated with a 1.43 mg/dL increase in BG at baseline (p.0031).

Table 1. Prevalence of type 2 diabetes among people living with HIV

| Diabetes Type 2 | Frequency | Percent | Cumulative Frequency | Cumulative Percent |
|------------------------|-----------|---------|----------------------|--------------------|
| 0(No) | 12882 | 84.45 | 12882 | 84.45 |
| 1(Yes) | 2372 | 15.55 | 15254 | 100.00 |
| Frequency Missing= 561 | | | | |

Figure 1. Depression among people living with HIV and type 2 diabetes

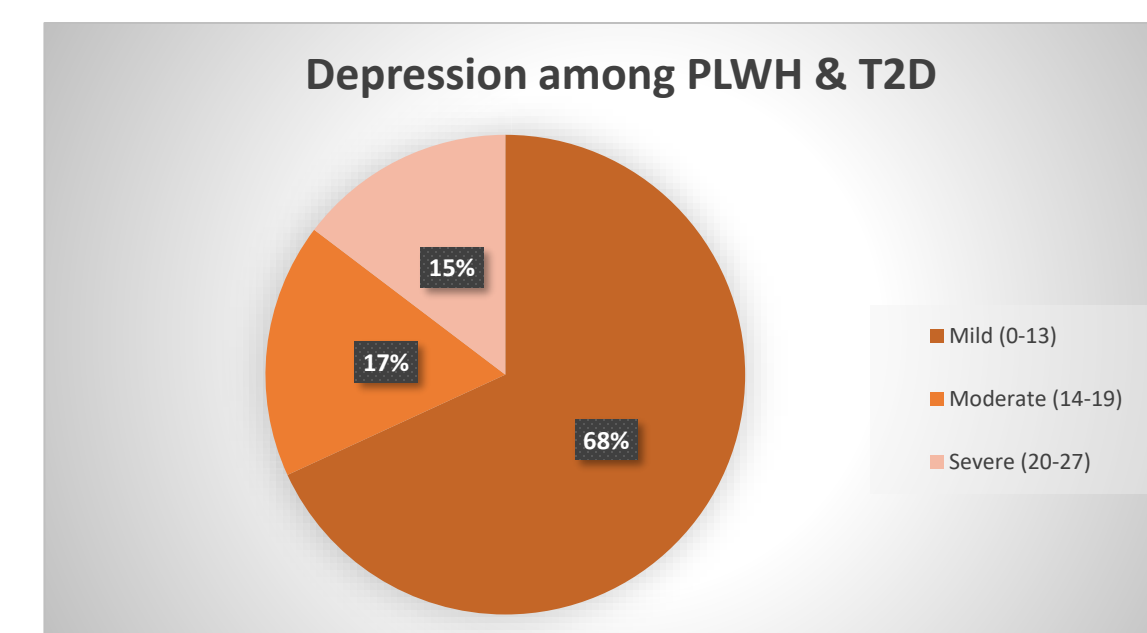


Table 2. Characteristics of CNICS Participants with and without type 2 diabetes

| Characteristic | HIV Only (%) | | HIV & T2DM (%) | | | P value | |
|------------------------|-------------------|---------|-------------------|---------|-------|---------|--------|
| | 1 (F) | 2 (M) | 1 (O) | 2 (W) | 3 (B) | | |
| Sex | 78.43 | 85.74 | 21.57 | 14.26 | | <.0001 | |
| Race | 1 (O) | 2 (W) | 3 (B) | 1 (O) | 2 (W) | 3 (B) | <.0001 |
| | 85.44 | 87.49 | 79.59 | 14.56 | 12.51 | 20.41 | |
| Depression Medications | 0 (No) | 1 (Yes) | 0 (No) | 1 (Yes) | | | 0.1399 |
| | 38.40 | 61.60 | 40.01 | 59.99 | | | |
| Age | 39.1889 (10.5586) | | 44.7913 (10.0907) | | | <.0001 | |
| Stigma Score | 1.0910 (1.1033) | | 0.9507 (1.0588) | | | <.0001 | |
| Social Support | 19.9188 (3.8934) | | 20.2032 (3.5880) | | | 0.0284 | |
| Depression | 6.7460 (6.6519) | | 6.148 (6.4282) | | | <.0001 | |
| HIV symptoms | 3.496 (4.2160) | | 3.5487 (4.3088) | | | 0.6165 | |

*F= female, M=Male, O=other, W=white, B=black

CONCLUSIONS (IMPLICATIONS FOR THE DCES)

PLWH are at increased risk for developing T2D and may experience worse HIV symptoms. Of note, African-Americans living with HIV appear to be at higher risk for the development of T2D. The prevalence of depression among PLWH & co-morbid T2D similar to that of persons with diabetes alone. Further depression appears to have an impact on BG. Thus, encounters with this population should be person centered and take into account the sometimes-competing self-care behaviors involved in self-managing these dual conditions.

KEY REFERENCES

1. U.S. Statistics. 2022 October 27, 2022 [cited 2023 6.15.2023]; Available from: <https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics/>.
2. Harding, K.A., et al., *Depression prevalence in Type 2 diabetes is not related to diabetes-depression symptom overlap but is related to symptom dimensions within patient self-report measures: a meta-analysis.* Diabet Med, 2019. **36**(12): p. 1600-1611.
3. Sunny, A.K., et al., *Depression among people living with type 2 diabetes in an urbanizing community of Nepal.* PLoS One, 2019. **14**(6): p. e0218119.