Poster #868

Emerging Non-AIDS Comorbidities Among Young Adults With and Without Perinatally-Acquired HIV

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ABSTRACT:

Background: Patients with perinatally acquired HIV (PHIV) who age into adulthood may be at unique risk for the early development of specific non-AIDS associated comorbidities (NAC). It is unclear whether the early initiation of ART among PHIV may decrease risk for the development of specific NAC.
Methods: This retrospective study (N= 344) included a cohort of PHIV as well as an age range-matched cohort of people with non-perinatally acquired HIV (NPHIV). NAC outcomes were examined, including diabetes mellitus (DM), hypertension (HTN), chronic kidney disease (CKD, ≥stage 3), dyslipidemia, CAD/CHF, cancer, and asthma. Death was also examined as a discreet outcome. Descriptive statistics were used to characterize the study population. Univariate and multivariate logistic regression models were used to examine the association between potential immunologic, virologic, and demographic predictors and NAC. Log rank test was used to compare Kaplan-Meier curves for NAC outcomes. Finally, a logistic regression model was used to examine the association between time to ART initiation and the development of NAC among PHIV.
Results: PHIV (N=171) significantly differed from NPHIV (N=173) on age (30.1 vs 31.8 yrs), sex at birth (females 60.2% vs. 40.5%), tobacco use (37.3 vs 60%), CD4 nadir (47.4% vs 16.8% with CD4 nadir <200 cells/mm3), and active HIV viral suppression (69% vs 82.7%). The cohorts did not differ on race (95.1% vs. 90.9% Black) and obesity (PHIV 33.9% vs, 39.3%). Both groups had high rates of HTN (PHIV 38.5%, NPHIV 29.5%), CKD (PHIV 5.9%, NPHIV 1.73%), dyslipidemia (PHIV 28.9%, NPHIV 28.2%), and active asthma (32.8%, 35.8%). 8.8% of the PHIV cohort died vs 0.6% of the NPHIV cohort. By multivariable analysis (inclusive of age, PHIV status, sex at birth, tobacco use, CD4 nadir, and viral suppression) PHIV demonstrated a higher likelihood of HTN (OR 1.87, 95% CI 1.1-3.2), CKD (OR 6.95, 95% CI 1.7-29.7), and a non-significant trend towards higher likelihood of death (OR 7.66, 95% CI 0.94-65.5). PHIV had significantly earlier acquisition of HTN (p=0.004), and CKD [(p=0.017), Figure 1]. Rates of NAC among patients within the PHIV cohort did not differ based on time to ART initiation (≤6 months vs >6 months after birth).
Conclusions: Compared to NPHIV of similar age, PHIV adults had higher rates of HTN and CKD and were more likely to acquire these diseases at a younger age than NPHIV. These findings may have long term implications for cardiovascular risk among aging PHIV.

INTRODUCTION:

- In the adult HIV population there is an increased risk for the early onset of several aging-associated comorbidities (NAC), including hypertension, dyslipidemia, hypertriglyceridemia, diabetes mellitus, chronic kidney disease, coronary artery/cerebral vascular disease, cancer, and bone loss, among others.[1,2,3,4]
- These trends may be driven by HIV-associated inflammation, immune exhaustion, factors associated with normal biological mechanisms aging, as well as with cART toxicity and traditional risk factors such as tobacco use.[3]
- Individuals with perinatally acquired HIV (PHIV) who age into adulthood may be at unique risk for the early development of specific NAC.
- There is a need to explore patterns and predictors of non-AIDS comorbidities among young adults with PHIV and NPHIV.

METHODS:

Study Design

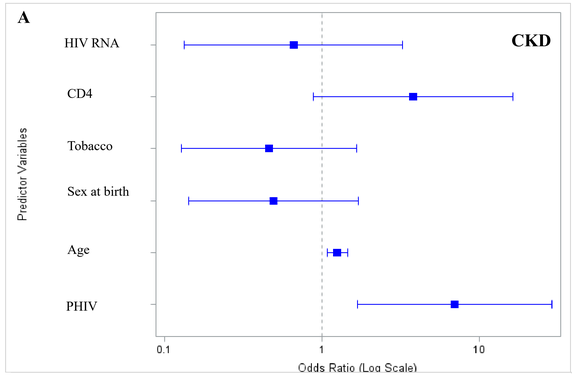
- Retrospective cohort study, including 2 groups:
  - Adults with perinatally acquired HIV (**PHIV**), N= 171
  - Age range-matched adults with non-perinatally-acquired HIV (**NPHIV**), N= 173
- Primary outcome: Non-AIDS comorbidity, defined as follows:
  - **Diabetes mellitus**: Provider documentation and/or HgA1c >6.5% and/or prescription for diabetes mellitus treatment
  - **Hypertension**: >= 2 clinic ambulatory blood pressures readings of >=140/90 in the previous 12 months, and/or any history of receipt of antihypertensive medication for the treatment of hypertension
  - **Dyslipidemia:** documented total cholesterol >=200 mg/dL, and/or prescription for dyslipidemia treatment
  - **Hypertriglyceridemia**: triglyceride level >= 150 mg/dL and/or prescription for hypertriglyceridemia treatment
  - **CKD:** eGFR <60 ml/minute, persistent at least 3 months apart
  - **Asthma (active):** provider documentation and/or prescription for asthma treatment
  - **CAD/CVD:** provider documentation
  - **Cancer**: provider documentation
- Secondary outcomes:
  - Clinical, demographic, virological immunological predictors:
    - Obesity, tobacco use, sex, race, age
    - CD4 nadir, CD4/CD8 ratio, HIV RNA suppression
    - PHIV: early (within 1st 6 months of life) vs late ART initiation

Analysis

- Descriptive statistics were used to characterize the study population
- Univariate and multivariate logistic regression models were used to examine the association between potential immunologic, virologic, and demographic predictors and NAC
- Log rank test was used to compare Kaplan-Meier curves for NAC outcomes
- Logistic regression model was used to examine the association between time to ART initiation and the development of NAC among PHIV

	PHIV (N=171)	NPHIV (N=173)	P value
Current age (years)	30.1	31.8	P=0.0013
Race (%)	AA: 95.9 W: 2.3 O: 1.8	AA: 90.2 W: 4.6 O: 5.2	P=0.1033
Sex at birth (%)	60.2	40.5	P=0.0003
Tobacco use (%)	37.4	62.6	P<0.0001
BMI ≥30	33.9	39.3	P=0.3155
Nadir CD4 count <200 cells/mm3 (%)	47.4	16.8	P<0.0001
Most recent CD4/CD8 <1 (%)	66.1	70.5	P=0.418
Most recent HIV RNA <200 cpm (%)	69.0	82.7	P=0.0037
Died (%)	8.8	0.58	P=0.0002

Table 1: Demographic, clinical, virological, and immunologic characteristics of the cohort



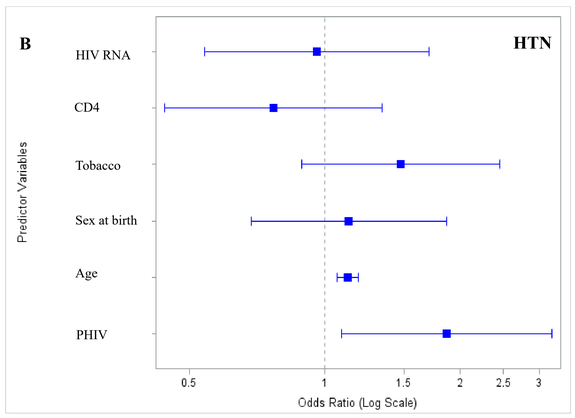


Figure 1: Adjusted odds ratios of CKD (A) and HTN (B) by multivariable analysis

	PHIV (N=171)	NPHIV (N=173)	P value	Prevalence in general population *
CKD ≥ Stage 2 (%)	5.9	1.7	P=0.05	1.4%[5]
Any cancer (%)	4.1	2.3	P=0.38	0.04-0.08%[6]
DM (%)	3.5	5.2	P=0.59	3-4.1%[7]
Dyslipidemia (%)	28.2	28.9	P=0.91	36%[8]
Hypertriglyceridemia (%)	34.1	29.5	P=0.42	15-25%[9]
HTN (%)	38.5	29.5	P=0.08	9.3-11.5%[7]
Active asthma (%)	32.8	35.8	P=0.57	5.2%[10]
CAD/CVD	2.9	2.9	P=1.0	3.9-7.8%[11]

Table 2: Prevalence of non-AIDS comorbidities among PHIV, NPHIV cohorts (*=normative data from literature)

TAKE HOME:

- **PHIV differed from NPHIV young adults by lower tobacco use, age, lower CD4 nadir, and lower viral suppression**
- **Young adults with PHIV and NPHIV had a high prevalence of hypertension, CKD, asthma, and cancer**
- **Young adults with PHIV were more likely than NPHIV to have HTN and CKD, and acquired both at an earlier age**
- **Though numbers were small, there was no difference in NAC prevalence among PHIV with early vs late ART start**

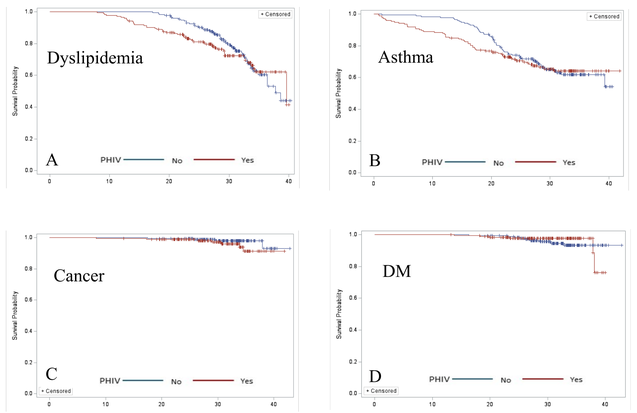


Figure 2: Time to event analysis for (A) Dyslipidemia, (B) Asthma, (C) Cancer, and (D) DM; p=NS for all 4

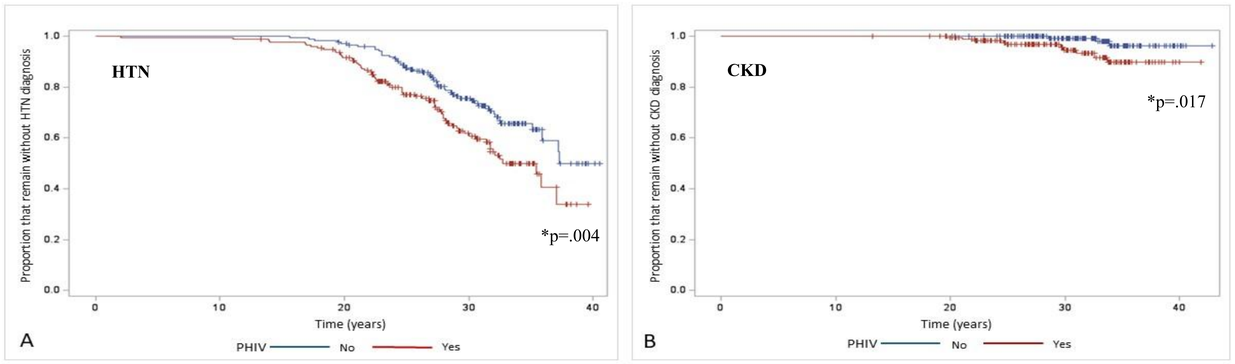


Figure 3: Time to event analysis for (A) HTN, and (B) CKD

	PHIV, early ART (N=21)*	PHIV, delayed ART (N=143)*	P value
Age, years (mean)	25.2	30.8	P<0.0001
Obesity (%)	38.1	33.6	P=0.81
Tobacco Use (%)	14.3	42.0	P=0.016
CD4 Nadir <200 cells/mm3 (%)	9.5	53.2	P=0.0001
Current CD4/8 <1 (%)	33.3	69.9	P=0.002
Last HIV RNA ND	90.5	65.0	P=0.022
CKD ≥ Stage 2 (%)	0	7.0	P=0.363
Any cancer (%)	0	4.2	P=1.0
DM (%)	0	4.2	P=0.59
Dyslipidemia (%)	42.9	26.8	P=0.19
HyperTG (%)	23.8	35.2	P=0.34
HTN (%)	9.5	44.0	P=0.003
Active asthma (%)	33.3	33.6	P=1.0
CAD/CVD (%)	0	3.5	P=1.0

Table 3: Characteristics of PHIV cohort, based on early (within 6 months of birth) or late (after 6 months of birth) ART start

RESULTS:

Baseline Cohort Characteristics

- PHIV (N=171) significantly differed from NPHIV (N=173) by:
  - Age (30.1 vs 31.8 yrs)
  - Sex at birth (females 60.2% vs. 40.5%)
  - Tobacco use (37.3 vs 60%)
  - CD4 nadir (47.4% vs 16.8% with CD4 nadir <200 cells/mm3)
  - Active HIV viral suppression (69% vs 82.7)

Non AIDS Comorbidity Outcomes

- Both groups had high rates of HTN, CKD, dyslipidemia, and active asthma (Table 2)
- 8.8% of the PHIV cohort died vs 0.6% of the NPHIV cohort
- By multivariable analysis PHIV demonstrated a higher likelihood of HTN (OR 1.87, 95% CI 1.1-3.2), CKD (OR 6.95, 95% CI 1.7-29.7) and a non-significant trend towards higher likelihood of death
- By log rank test PHIV had significantly earlier acquisition of HTN (p=0.004), and CKD [(p=0.017), Figure 3]
- By multivariable analysis, rates of NAC among patients within the PHIV cohort did not differ based on time to ART initiation (≤6 months vs >6 months after birth) though numbers were small

CONCLUSIONS:

- **Young adults with PHIV, NPHIV had high prevalence of several non-AIDS comorbidities including HTN, CKD, asthma, cancer**
- **Compared to NPHIV, PHIV adults had higher rates of HTN and CKD and were more likely to acquire these diseases at a younger age than NPHIV**
- **Though numbers were small, NAC did not significantly differ among PHIV with early ART initiation compared to delayed ART initiation**
- **Clinicians caring for all young adults living with HIV should be aware of heightened risk for several NAC**
- **Clinicians caring for PHIV young adults should carefully screen for the evolution of HTN and CKD**

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