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on behalf of the Centers for AIDS Research Network of Integrated Clinical Systems

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BACKGROUND

- The risk of osteonecrosis (ON), or bone death due to inadequate vascular supply, is estimated to be ~3-100-fold higher in people with HIV (PWH) compared to the general population
- Most information on ON in PWH is from older case reports, small case control studies, or cohort studies limited by small numbers of ON cases
- Critical gaps in understanding ON risks in the current HIV treatment era have emerged as the PWH continue to age

METHODS

- We examined ON among PWH in clinical care at 8 Centers for AIDS Research Network of Integrated Clinical Systems (CNICS) cohort sites from 2012-2023
 - CNICS integrates comprehensive demographic and clinical data from electronic medical records, as well as clinical assessments of patient-reported outcomes (PROs)
- ON cases were identified using diagnoses codes; 1 site validated diagnoses through clinical documentation and radiology reports with near 100% specificity
- Adjusted Cox proportional-hazards models were used to estimate associations between demographic and clinical characteristics and time to ON
 - Participants were censored at (1) the time of event, (2) the time of last activity in CNICS, (3) time of death, or (4) date of administrative censoring, whichever came first
 - Adjustment covariates: age, race/ethnicity, sex, CD4 count*, HIV viral load*, history of AIDS-defining illnesses (ADIs), corticosteroid use, hepatitis C virus (HCV) coinfection, liver function (FIB-4), kidney function (eGFR), hypertension, dyslipidemia, diabetes, and use of marijuana, tobacco, and alcohol (*time-updated)
 - *Pneumocystis jirovecii* pneumonia (PJP) analyzed separately from other ADIs due to steroid treatment considerations

Risk factors for osteonecrosis (ON) among PWH in the current treatment era:

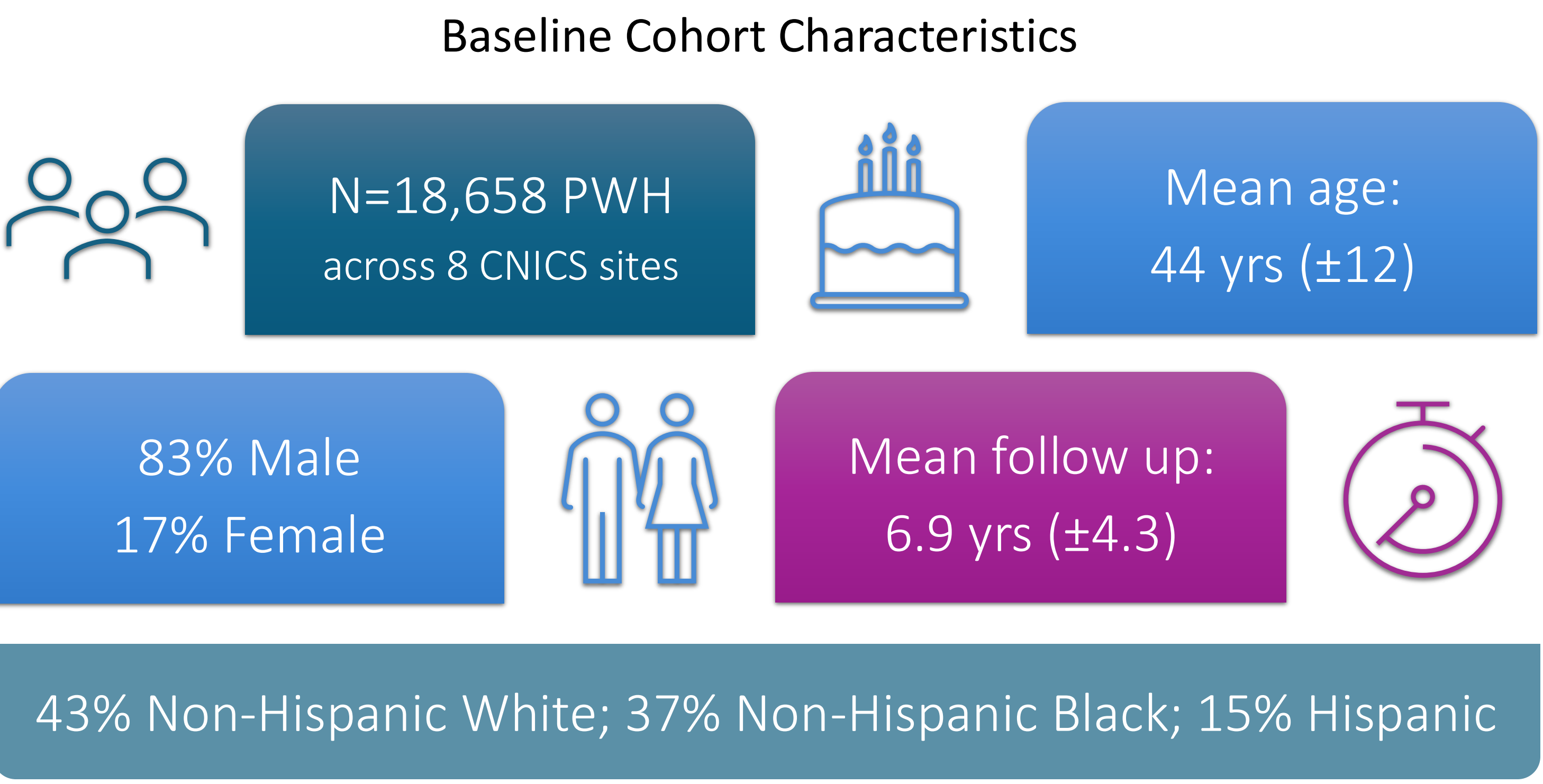
- HIV-specific:**
 - AIDS-defining illnesses
 - Lower CD4 cell count
- General:**
 - Older age
 - Corticosteroid use
 - Tobacco & Alcohol use

O N 276 PWH (1.5%) developed osteonecrosis during follow up

Table. Associations between likelihood of developing ON and demographic characteristics, HIV factors, comorbidities, & substance use

Characteristic	HR (95% CI)	P value
Age (per 10 years)	1.21 (1.05-1.39)	0.008
Female sex	1.13 (0.82-1.54)	0.5
Race/Ethnicity		
Non-Hispanic White (ref)	–	–
Non-Hispanic Black	1.02 (0.78-1.34)	0.9
Hispanic	0.65 (0.42-1.00)	0.05
VL (per doubling)	1.00 (0.96-1.04)	1.0
CD4 (per 100 cells/mm ³)	0.95 (0.91-0.99)	0.02
ADI (without PJP)	1.66 (1.28-2.16)	<0.001
<i>Pneumocystis jirovecii</i> pneumonia (PJP)	2.03 (1.50-2.76)	<0.001
HCV coinfection	1.04 (0.76-1.42)	0.7
Corticosteroid use	1.73 (1.35-2.22)	<0.001
FIB-4 (per 1.5)	1.00 (0.87-1.15)	1.0
eGFR (per 30)	0.90 (0.75-1.08)	0.2
Hypertension	0.95 (0.71-1.27)	0.7
Dyslipidemia	1.19 (0.88-1.62)	0.3
Diabetes	1.05 (0.70-1.56)	0.8
Cannabis use	1.09 (0.84-1.42)	0.5
Tobacco use	1.52 (1.18-1.95)	0.001
Alcohol use (per 5 on AUDIT-C)	1.40 (1.12-1.76)	0.004

RESULTS



CONCLUSIONS

- In addition to established risk factors for ON in the general population (e.g., corticosteroid use, alcohol use), HIV-related factors continue to be significant predictors of ON in the current treatment era: ADIs & low CD4 cell count highlighting importance of continued focus on early diagnosis and treatment
- Behavioral risk factors, including tobacco and alcohol use, which are generally more prevalent among PWH, also highlight actionable prevention targets reinforcing the importance of early ART initiation and lifestyle interventions

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