Adult Outcomes among Young People with Perinatal HIV Infection and Exposure in the United States

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BACKGROUND

- Advances in HIV treatment have allowed children with perinatally-acquired HIV (PHIV) to thrive in adulthood and, in the US, dramatically reduced the risk of transmission to children born to women living with HIV, perinatally exposed but uninfected (PHEU).
- Little is known about biomedical and behavioral health outcomes, including mental health and substance use (SU), or attainment of adult milestones in young people with PHIV (YPPHIV) or young people with PHEU (YPPHEU) as they reach adulthood.
- We examined associations between HIV-status and behavioral health outcomes, and adult milestones among a longitudinal cohort of YPPHIV and YPPHEU in adulthood.

METHODS

- **CASAH** is an observational longitudinal study with YPPHIV and YPPHEU recruited at 9-16 years of age in 2003-2008 with study visits every 12–18-months
- Data come from 187 participants, (124 YPPHIV, 63 YPPHEU) who completed study visits in 2019-23
- Comprehensive psychiatric (DISC) and psychosocial interviews, and questions about demographics, **sexual behavior**, and **young adult milestones** were completed
- For YPPHIV, samples were obtained for HIV Viral RNA Load (VL) and CD4$^+$ cell count
- **Cognitive functioning** was measured with NeuroScreen (NS), a tablet-based neurocognitive test battery. Sample based z-scores for all 12 tests were calculated, as was a global z-score (mean of 12 z-scores)

RESULTS

- Demographics: Mean age was 28 years (SD 3); 60% had female sex assigned at birth; 64% were Black, 47% Latino with no significant differences by HIV status. For YPPHIV:
- Median CD4+ cell count was 450 cells/mm^3 (SD 357); 48% had CD4>500 cells/mm^3
- Median VL was 70,799 cps/mL(SD 330,599); 65% had VL <200 copies/ml
- All YPPHIV were on ART: 60% received 2NRTI+INSTI or bPI; 24% received 2NRTI+INSTI+bPI or NNRTI

Young people with perinatal HIV infection and perinatal HIV exposure but uninfected have comparable behavioral health outcomes as they transition into adulthood. Those with HIV infection continue to demonstrate greater neurocognitive deficits which may impact long-term outcomes.

Table 1: Adult Milestones

	Total (N=187)	YPPHEU (N=63)	YPPHIV (N=124)	
Sex and Pregnancy	N (%)	N (%)	N (%)	p
Had Vaginal/Anal Sex (past 3 months)	135 (75%)	45 (74%)	90 (76%)	.713
Had Condomless Sex (past 3 months)	100 (56%)	38 (62%)	62 (53%)	.213
Ever Been Pregnant (Females)	58 (55%)	20 (59%)	38 (53%)	.559
Education/Employment				
< H.S. Diploma	22 (12%)	7 (11%)	15 (12%)	.705
H.S. Diploma/GED	99 (53%)	31 (50%)	68 (55%)	
Some College or More	64 (35%)	24 (39%)	40 (33%)	
Currently in School	19 (10%)	7 (11%)	12 (10%)	.759
Currently Employed	83 (44%)	38 (60%)	45 (36%)	**.002**
Currently Employed/In School	94 (50%)	41 (65%)	53 (43%)	**.004**
Housing				
In Their Own Home	102 (55%)	21 (33%)	81 (65%)	**<.001**
In Parent's/Family's Home	71 (38%)	36 (57%)	35 (28%)	
Other	14 (8%)	6 (10%)	8 (7%)	
Lives with Children	40 (21%)	12 (19%)	28 (23%)	.579

Table 2: Neurocognitive Data

	Total (N=148)	YPPHEU (N=46)	YPPHIV (N=102)	
	Mean (SD)	Mean (SD)	Mean (SD)	p
Trail Making 1	23.0 (14.7)	18.3 (5.6)	25.0 (16.8)	**.001**
Trail Making 2	28.7 (13.6)	26.2 (16.0)	29.7 (12.4)	.136
Trail Making 3	11.1 (7.9)	9.7 (4.5)	11.7 (8.9)	.151
Finger Tapping Dominant Hand	262.4 (56.6)	266.2 (50.4)	260.9 (59.2)	.588
Finger Tapping Nondominant	251.5 (51.5)	255.5 (50.2)	249.8 (52.1)	.527
Visual Discrimination 1	17.7 (4.2)	19.3 (3.4)	17.1 (4.3)	**.001**
Visual Discrimination 2	30.2 (5.9)	31.7 (5.0)	29.6 (6.1)	**.045**
Number Span Forwards	4.4 (1.2)	4.8 (1.3)	4.2 (1.2)	**.006**
Number Span Backwards	2.9 (1.3)	3.1 (1.2)	2.9 (1.3)	.263
Number Speed Total	25.9 (6.2)	25.0 (4.8)	26.3 (6.7)	.225
Verbal List Learning	9.2 (1.2)	9.4 (0.7)	9.1 (1.3)	**.033**
Verbal List Delayed Recall	2.8 (1.5)	2.8 (1.6)	2.7 (1.4)	.843
Global Z-score	0.0 (0.6)	0.2 (0.4)	-0.1 (0.6)	**.001**
	N (%)	N (%)	N (%)	p
NeuroScreen Impaired Range	25 (13%)	2 (4%)	23 (20%)	**.010**

RESULTS (CONT.)

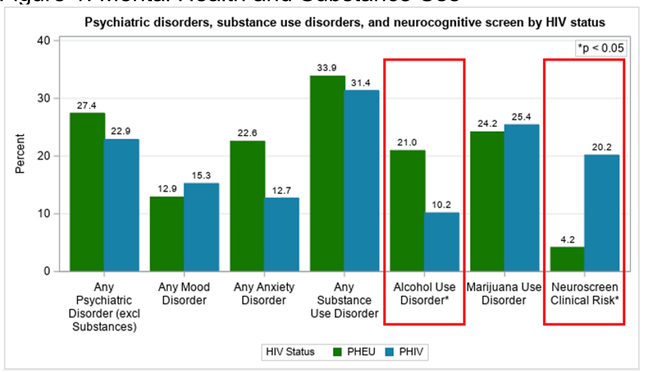
- Sex and Relationships: Most participants were never married (94%); 75% reported currently sexually active
- Education/Employment: 50% of participants were in school or employed, with higher rates in YPPHEU vs YPPHIV (Table 1)
- Housing: YPPHIV were more likely than YPPHEU to receive housing assistance, public assistance and food stamps (Table 1), and to have a history of homelessness (data not shown)
- Incarceration: 18% of participants reported incarceration history with no HIV-status differences (Table 1)

RESULTS (CONT.)

As shown in Figure 1

- **Overall, 24% met criteria for a non-SU psychiatric disorder** (primarily depression and anxiety)
- **32% met criteria for any SU disorder** (primarily alcohol and/or marijuana use)
- There were no differences by HIV status with the exception of alcohol use disorder and NS clinical risk

Figure 1: Mental Health and Substance Use



- Cognition: **YPPHIV performed worse on cognitive tests** with 20% having global test performance 1 SD below sample mean (Table 2)
- There were no significant differences by sex assigned at birth for psychiatric diagnoses or overall neurocognitive performance (data not shown)

CONCLUSIONS

- Despite early challenges, many YPPHIV and YPPHEU had positive behavioral health outcomes (e.g., achievement of young adult milestones, no psychiatric or substance use disorders). A majority of YPPHIV were virally suppressed.
- However, for both groups, psychiatric and SU disorders, neurocognitive deficits, and challenges with education, employment, housing and incarceration were also observed in many participants and can be associated with health and adult functioning problems, especially in context of HIV.
- Findings underscore an urgent need to identify those at risk for poor outcomes and develop and scale-up interventions.

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