

PO-081: Childhood Trauma (ChT) Modifies the Impact of Brain Volume on Cognitive and Daily Functioning In Virally-Suppressed People Living With HIV (PLWH)

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INTRODUCTION

- Growing evidence suggests a detrimental effect of combined childhood trauma (ChT) and HIV on brain morphology and neurocognition.
- ChT in people living with HIV (PLWH) has been associated with larger bilateral (BL) amygdala, lower psychomotor & processing speed¹; smaller right (R) anterior cingulate cortex, corpus callosum, BL caudate, BL putamen, and BL hippocampi²; and lower verbal fluency³.
- Limitations of evidence:** untreated HIV/lack of viral suppression, lack of socio-demographic representation

Aim 1: To evaluate the effect of ChT on neurocognition, daily functioning, and brain morphology in PLWH

Aim 2: To explore how ChT modifies the relation between brain morphology and neurocognition and daily functioning in PLWH

METHODS

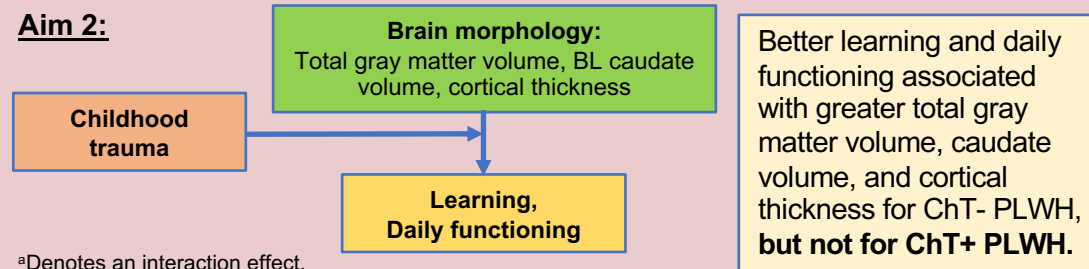
- ALLHANDS Study:** National Institutes of Health (NIH) and Department of Defense (DoD)
- Community-dwelling participants from DC, and military beneficiaries (DC; San Diego, CA)
- Eligibility:** PLWH > 18 years, on ART ≥ 1 year, AND viral load (VL) < 200 c/mL
- Exclusion:** Hx of adult-onset trauma only and not ChT (n = 50) and failed Medical Symptom Validity Test (n = 8).

IRB Statement: The study protocol was approved by the USUHS IRB Institutional Review Board in Compliance with all applicable Federal regulations governing the protection of human subjects. **Disclaimer:** The views expressed herein are those of the author(s) and do not necessarily reflect the official policy or position policies of Uniformed Services University of the Health Sciences (USUHS), the Department of Defense (DoD), the Departments of the Army, Navy, Air Force, Naval Medical Center San Diego, Walter Reed National Military Medical Center, the U.S. Government, National Institutes of Health, or the Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.

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RESULTS

Aim 2:



^aDenotes an interaction effect.

| Learning (adj. R ² = 0.04) | All subjects (N = 147) | | CHT+ (N = 101) | | CHT- (N = 46) | |
|---------------------------------------|------------------------|--------------|----------------|-------|---------------|--------------|
| | B | p | B | p | B | p |
| Childhood trauma | 28.60 | 0.014 | - | - | - | - |
| Total gray matter (cm ³) | 0.04 | 0.012 | -0.01 | 0.357 | 0.05 | 0.010 |
| ChT x gray matter ^a | -0.05 | 0.010 | - | - | - | - |
| Cohort (ref. NIH) | -0.80 | 0.629 | 0.61 | 0.774 | -3.05 | 0.271 |
| Duration untreated HIV | -0.14 | 0.121 | -0.15 | 0.146 | -0.06 | 0.751 |

| Learning (adj. R ² = 0.04) | All subjects (N = 147) | | CHT+ (N = 101) | | CHT- (N = 46) | |
|---|------------------------|--------------|----------------|--------------|---------------|-------|
| | B | p | B | p | B | p |
| Childhood trauma | 22.35 | 0.025 | - | - | - | - |
| Bilateral caudate (cm ³) | 1.45 | 0.213 | -2.14 | 0.012 | 1.43 | 0.276 |
| ChT x caudate ^a (cm ³) | -3.56 | 0.016 | - | - | - | - |
| Cohort (ref. NIH) | 0.55 | 0.719 | 0.87 | 0.647 | 0.05 | 0.986 |
| Duration untreated HIV | -0.15 | 0.084 | -0.16 | 0.111 | -0.13 | 0.510 |

- Functional declines on ChT x cortical thickness^a (B = 2.01, **p = 0.048**) became n.s. after adjusting for cohort, demographics, and years of untreated HIV (B = 1.83, *p* = 0.076). ChT- PLWH had a negative association between cortical thickness and functional declines (B = -2.29, **p = 0.031**), but ChT+ PLWH had a n.s. association (B = 0.38, *p* = 0.650).

CONCLUSIONS

- ChT may stunt the potential benefits of increased brain volume and thickness on neurocognition and daily functioning in PLWH and increase vulnerability to HIV-related neuropathology.**
- Fewer detrimental effects of ChT were found than in prior work, demonstrating that well-treated HIV may minimize this vulnerability.
- Future work will investigate interactions between ChT x brain morphology in other cognitive domains.
- Implementing trauma-informed care and evidence-based mental health interventions may help improve/maintain cognition in PLWH.

Demographics and HIV-related factors:

- 66.9% (164/245) of PLWH had ChT**
- ChT was more prevalent in the NIH cohort (*p* = 0.011), women (88.8%, *p* < 0.001), and non-Whites (59.0%, *p* = 0.019).
- ChT was associated with greater years of untreated HIV (4.8 v. 2.8, *p* = 0.044), greater depressive sx (9.1 v. 5.5, *p* < 0.001), and taking psychiatric medication (32% v. 12%, *p* = 0.001).

Aim 1:

- ChT+ PLWH had worse learning (47.8 v. 50.4, *p* = 0.029) and greater functional difficulties (all *ps* < 0.031). Other cognitive domains n.s. (all *ps* > 0.05).
- Rates of NCI did not differ between ChT+ (25%) and ChT- (17.3%), *p* = 0.173.
- ChT+ PLWH had less average cortical thickness, total white matter, total gray matter, pallidum, hippocampal, and amygdala volumes (all *ps* < 0.05).
- After adjusting for demographics, cohort, and intracranial vault, univariate differences in brain morphology became n.s. (all *ps* > 0.40).