Increased brain atrophy in homeless and precariously housed individuals compared to the general population

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Background

• Homeless and precariously housed individuals experience a high burden of mental and physical illness, as well as higher mortality than the general population.

• More than half of homeless or precariously housed individuals have a history of traumatic brain injury (TBI) and nearly one quarter report a history of moderate or severe TBI.

• There is relatively little research on the role of brain health in this vulnerable population.

Objectives

1. To evaluate how brain atrophy in homeless or precariously housed individuals compares to the general population.
2. To evaluate whether TBI or substance dependence are associated with greater brain atrophy among homeless or precariously housed individuals.
3. To evaluate how greater brain atrophy is associated with functioning.

Methods

Hotel Study (n = 324)
- Recruited from single-room occupancy hotels, downtown community court, and St. Paul’s hospital.
- 77% male; 67% with history of homelessness.
- Substance dependence diagnoses & measures of functioning.
- TBI history.
- T1-weighted MRI.

Cambridge Centre for Ageing and Neuroscience (Cam-CAN; n = 398)
- Recruited from general population (Cambridge, UK).
- 47% male.
- T1-weighted MRI.

Statistical analysis

• To evaluate atrophy compared to the general population we used multiple linear regression with a group*age interaction term.
• We used multiple linear regression to evaluate how TBI and substance dependence were associated with brain atrophy, and to evaluate how brain atrophy was associated with functioning. Each model covaried for age and sex.

Results

Greater brain atrophy in homeless or precariously housed adults than the general population

Estimated atrophy before and after the median age of the sample

Estimated yearly atrophy rate after age 42 as compared to before age 42:
- Cam-CAN: 1.18x
- Hotel Study: 3.13x

Correlates of greater atrophy in Hotel Study

• Alcohol dependence ($\beta = -0.11, p = 0.027$)
• Traumatic brain injury ($\beta = -0.18, p < 0.0001$)

Greater atrophy is associated with:

• Poorer cognitive functioning test scores ($\beta = 0.14, p = 0.015$)
• Poorer scores on measure of independent living ($\beta = 0.15, p = 0.024$)

Future directions

• Next, we plan to look at decline in diffusion tensor imaging metrics of white matter microstructure between the Hotel Study and general population.
• We also plan to look at longitudinal trajectories of decline in the Hotel Study by leveraging the 10+ years of follow-up MRI scans.

Takeaways and implications

1. There may be greater brain atrophy among homeless or precariously housed populations than the general population.
2. TBI and alcohol dependence at risk factors for greater atrophy.
3. Greater atrophy is associated with poorer functioning.

References


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