Homeless

Although homeless persons experience traumatic brain injury (TBI) frequently, little is known about the structural and functional brain changes in this group. We aimed to describe brain volume changes and related cognitive/motor deficits in homeless persons with or without TBI versus controls. Participants underwent T1-weighted magnetic resonance imaging (MRI), neuropsychological (NP) tests (the Grooved Pegboard Test [GPT]/Finger Tapping Test [FTT]), alcohol/drug use screens (the Alcohol Use Disorders Identification Test [AUDIT]/Drug Abuse Screening Test [DAST]), and questionnaires (the Brain Injury Screening Questionnaire [BISQ]/General Information Questionnaire [GIQ]) to determine TBI. Normalized volumes of brain substructures from MRI were derived from FreeSurfer. Comparisons were tested by Mann-Whitney U and Kruskal-Wallis rank sum tests. Leave-one-out cross-validation using random forest classifier was applied to determine the ability of predicting TBI. Diagnostic ability of this classifier was assessed using area under the receiver operating characteristic curve (AUC). Fifty-one participants-25 homeless persons (9 with TBI) and 26 controls-were included. The homeless group had higher AUDIT scores and smaller thalamus and brainstem volumes ($p < 0.001$) than controls. Within homeless participants, the TBI group had reduced normalized volumes of nucleus accumbens, thalamus, ventral diencephalon, and brainstem compared with the non-TBI group ($p < 0.001$). Homeless participants took more time on the GPT compared with controls using both hands ($p < 0.0001$); but the observed effects were more pronounced in the homeless group with TBI in the non-dominant hand. Homeless persons with TBI had fewer dominant hand finger taps than controls ($p = 0.0096$), and homeless participants with ($p = 0.0148$) or without TBI ($p = 0.0093$) tapped less than controls with their non-dominant hand. In all participants, TBI was predicted with an AUC of 0.95 (95% confidence interval [CI]: 0.89-1.00) by the classifier modeled on MRI, NP tests, and screening data combined. The MRI-data-based classifier was the best predictor of TBI within the homeless group (AUC: 0.76, 95% CI: 0.53-0.99). Normalized volumes of specific brain substructures were important indicators of TBI in homeless participants and they are important indicators of TBI in the state of homelessness itself. They may improve predictive ability of NP and screening tests in determining these outcomes [1)].

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Cusimano MD, Saha A, Zhang D, Zhang S, Casey J, Rabski J, Carpino M, Hwang SW. Cognitive Dysfunction, Brain Volumes, and Traumatic Brain Injury in Homeless Persons. Neurotrauma Rep. 2021 Mar 5;2(1):136-148. doi: 10.1089/neur.2020.0031. PMID: 33796876; PMCID: PMC8006590.