B10

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A longitudinal analysis of post-traumatic headache recovery: Use of cross sectional structural brain analysis and cosine similarity to evaluate brain metric stability

Rationale:
Post traumatic headache (PTH) is a common, debilitating clinical consequence of traumatic brain injury (TBI) which can become chronic in certain patients. The identification and treatment of this condition is challenging due to the lack of knowledge surrounding the exact physiological processes that cause PTH and the difficulty that comes with understanding why symptoms persist in some and not others. This longitudinal investigation aimed to understand structural brain changes in the one-year post-injury period in persons with post-traumatic headache.
Methods:
The sample included 15 acutely resolved (within 3 months), 11 persistent (headaches persisting beyond 3 months) and 18 healthy control participants. Behavioral data and psychological questionnaires were extracted and analyzed.
Results/Discussion:
For the right hemisphere, times 1 and 4 revealed the precentral gyrus to be the region with the most frequent group differences in cortical thickness changes. Cosine similarity was calculated for each of the brain regions to understand metric stability that was compared between time points. Correlational analysis of demographic, behavioral, and brain imaging data was completed for Time 1 to identify relationships between them. We show differences in persons with post-traumatic headache based on symptom trajectory that occurred both cross-sectionally, and between time points. Stability of brain regions should be incorporated in future longitudinal research.
Significance:
The differences in cortical thickness amongst the different groups suggest an organic basis to post-traumatic headache, which is a step towards an objective way to accurately diagnose and treat the condition.