

## Accelerated longitudinal cortical atrophy in OEF/OIF/OND veterans with severe PTSD and the impact of comorbid TBI

Emma M Brown

Neuroimaging Research for Veterans (NeRve) Center, VA Boston Healthcare System, Boston, Massachusetts, USA

### Abstract

Veterans who deployed in support of Operation Enduring Freedom (OEF), Iraqi Freedom (OIF), and New Dawn (OND) commonly experience severe psychological trauma, often accompanied by physical brain trauma resulting in mild traumatic brain injury (mTBI). Prior studies of individuals with posttraumatic stress disorder (PTSD) have revealed alterations in brain structure, accelerated cellular aging, and impacts on cognition following exposure to severe psychological trauma and potential interactive effects of military-related mTBI. To date, however, little is known how such deployment-related trauma changes with time and age of injury of the affected veteran. In this study, we explored changes in cortical thickness, volume, and surface area after an average interval of approximately 2 years in a cohort of 254 OEF/OIF/OND Veterans ranging in age from 19 to 67 years. Whole-brain vertex-wise analyses revealed that veterans who met criteria for severe PTSD (Clinician-Administered PTSD Scale  $\geq 60$ ) at baseline showed greater negative longitudinal changes in cortical thickness, volume, and area over time. Analyses also revealed a significant severe-PTSD by age interaction on cortical measures with severe-PTSD individuals exhibiting accelerated cortical degeneration with increasing age. Interaction effects of comorbid military-related mTBI within the severe-PTSD group were also observed in several cortical regions. These results suggest that those exhibiting severe PTSD symptomatology have accelerated atrophy that is exacerbated with increasing age and history of mTBI.

**Keywords:** FreeSurfer; aging; cortical thickness; longitudinal; mild traumatic brain injury; posttraumatic stress disorder.

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### Biography

Emma M Brown is currently working for Neuroimaging Research for Veterans (NeRve) Center, VA Boston Healthcare System, Boston, Massachusetts, USA. He has attended and gave his presentation on Accelerated

longitudinal cortical atrophy in OEF/OIF/OND veterans with severe PTSD and the impact of comorbid TBI. He has published papers in many international reputed scopus journals.