EXECUTIVE ATTENTION DEFICITS AFTER TRAUMATIC BRAIN INJURY (TBI) REFLECT IMPAIRED RECRUITMENT OF RESOURCES

SUDHIN A. SHAH, PH.D.
INSTRUCTOR IN NEUROSCIENCE
THE FEIL FAMILY BRAIN & MIND RESEARCH INSTITUTE
WEILL CORNELL MEDICAL COLLEGE

Research Abstract
Deficits in attention are a common and devastating consequence of traumatic brain injury (TBI) leading to functional impairments, rehabilitation barriers, and long-term disability. While such deficits are well documented, little is known about their underlying pathophysiology, hindering development of effective and targeted interventions. Owing to the heterogeneity of deficits, recovery patterns, and the lack of prognostic sensitivity in standard clinical assessments, the development of targeted interventions will require measures that reliably track pathophysiological alteration of attentional function at the individual subject level. In a recent study we investigated the mechanisms underlying attentional deficits in chronic TBI patients (at least 6 months post-injury at enrollment) and showed that executive attention is associated with a relative increase in EEG frontal theta power and broad decreases of alpha and beta power over parietal-occipital regions, with individual expression of this pattern in a spatiotemporal analysis correlating with task performance in the TBI patients. TBI induced deficits in executive attention are proposed to result from deafferentation of the anterior forebrain mesocircuit. Our results hold promise for developing biomarkers for clinical and rehabilitative studies of interventions and recovery after TBI.

Publications