

Memory-Guided Oculomotor Task in High School Football Players with ADHD, Post-Concussive Injuries, and Controls

Authors : B. McGovern, J. F. Luck, A. Gade, I. V. Lake, D. O'Connell, H. C. Cutcliffe, K. P. Shah, E. E. Ginalis, C. M. Lambert, N. Christian, J. R. Kait, A. W. Yu, C. P. Eckersley, C. R. Bass

Abstract : Mild traumatic brain injury (mTBI) in the form of post-concussive injuries and attention deficit / hyperactivity disorder (ADHD) share similar cognitive impairments, including impaired working memory and executive function. The memory-guided oculomotor task separates working memory and inhibitory components to provide further information on the nature of these deficits in each pathology. Eleven subjects with ADHD, fifteen control subjects, and ten subjects with recent concussive injury were matched on age, gender, and education (all high school-age males). Eye movements were recorded during memory-guided oculomotor tasks with varying delays using EyeLink 1000 (SR Research). The percentage of premature saccades and the latency of correct response are the analyzed measures for response inhibition and working memory, respectively. No significant differences were found in latencies between controls subjects and subjects with ADHD or post-concussive injuries, in accordance with previous studies. Subjects with ADHD and post-concussive injuries both demonstrated a trend of increased percentages of premature saccades compared to control subjects in the same oculomotor task. This trend reached statistical significance between the post-concussive and control groups ($p < 0.05$). These findings support the primary nature of the executive function deficits in response inhibition in ADHD and mTBI. The interpretation of results is limited by the small sample size and the exploratory nature of the study. Further investigation into oculomotor performance differences in mTBI and ADHD may help in differentiating these pathologies in consequent diagnoses and provide insight into the interaction of these deficits in mTBI.

Keywords : attention deficit / hyperactivity disorder (ADHD), concussion, diagnosis, oculomotor, pediatrics

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020