Clinical Approach to Predict Cognitive Disorders in Multiple Sclerosis: The Use of Biomarkers Generated by Eye Movement Disorders

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Eye movement disorders (EMD) are common with Multiple Sclerosis (MS) patients, caused by lesions in the brain hindering patients' simplest daily activities. These lesions are additionally believed to influence the cognitive function and commonly cause declines in different cognitive domains among MS patients. Cognitive function is often assessed by conventional clinical assessments, which could be difficult as well as inaccurate for some patients' responses. This encouraged us to developing a new and reasonably priced diagnostic tool that depends on biomarkers generated by EMD that can help recognize cognitive deficits in early stages of the disease with higher accuracy. In this study, saccade test was performed onto 20 MS patients, and their eye movement parameters (EMP) including latency and amplitude as detectors of EMD were captured. The patients' MRI and Montreal Cognitive Assessment (MOCA) were obtained. The data were analyzed showing strong correlation between EMP and cognitive level. We programmed this correlation designing simple tool using diagnostic algorithms to enable recognizing of cognitive disorders depending on captured EMP, the diagnostic model achieved high accuracy. EMP have been provided that it can be used to give a special insight into cognitive function and work well as biomarkers for cognitive deficits providing more sensitive and accurate cognitive assessment tool. We believe that our simple tool can be used to estimate the cognitive level of MS patients as a new and objective approach and serve as monitoring tool of brain higher functions.

Awards Won:
American Psychological Association: Certificate of Honorable Mention