Inhibitory Control of Saccadic Eye Movements and Cognitive Impairment in Mild Cognitive Impairment

Julius Opwonya

Abstract

**Background:** Mild cognitive impairment (MCI) may occur due to several forms of neurodegenerative diseases and non-degenerative conditions and is associated with cognitive impairment that does not affect everyday activities. For a timely diagnosis of MCI to prevent progression to dementia, a screening tool of fast, low-cost and easy access is needed. Recent research on eye movement hints it a potential application for the MCI screening. However, the precise extent of cognitive function decline and eye-movement control alterations in patients with MCI is still unclear.

**Method:** Patients with MCI (n = 79) and age-matched cognitively healthy controls (HC) (n = 170) completed four saccadic eye-movement paradigms: prosaccade (PS)/antisaccade (AS), Go/No-go, and a battery of neuropsychological tests.

**Result:** The findings revealed significantly longer latency in patients with MCI than in HC during the PS task. Additionally, patients with MCI had a lower proportion of correct responses and a marked increase in inhibition errors for both PS/AS and Go/No-go tasks. Furthermore, when patients with MCI made errors, they failed to self-correct many of these inhibition errors. In addition to the increase in inhibition errors and uncorrected inhibition errors, patients with MCI demonstrated a trend toward increased correction latencies. We also showed a relationship between neuropsychological scores and correct and error saccade responses.

**Conclusion:** Our results demonstrate that, similar to patients with Alzheimer’s dementia (AD), patients with MCI generate a high proportion of erroneous saccades toward the prepotent target and fail to self-correct many of these errors, which is consistent with an impairment of inhibitory control and error monitoring.