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A New Perspective in Cervical Dystonia: Neurocognitive Impairment

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Abstract : Background: Primary cervical dystonia is thought to be a purely motor disorder. But recent studies revealed that patients with dystonia had additional non-motor features. Sensory and psychiatric disturbances could be included into the non-motor spectrum of dystonia. The Basal Ganglia receive inputs from all cortical areas and throughout the thalamus project to several cortical areas, thus participating to circuits that have been linked to motor as well as sensory, emotional and cognitive functions. However, there are limited studies indicating cognitive impairment in patients with cervical dystonia. More evidence is required regarding neurocognitive functioning in these patients. Objective: This study is aimed to investigate neurocognitive profile of cervical dystonia patients in comparison to healthy controls (HC) by employing a detailed set of neuropsychological tests in addition to self-reported instruments. Methods: Totally 29 (M/F: 7/22) cervical dystonia patients and 30 HC (M/F: 10/20) were included into the study. Exclusion criteria were depression and not given informed consent. Standard demographic, educational data and clinical reports (disease duration, disability index) were recorded for all patients. After a careful neurological evaluation, all subjects were given a comprehensive battery of neuropsychological tests: Self report of neuropsychological condition (by visual analogue scale-VAS, 0-100), RAVLT, STROOP, PASAT, TMT, SDMT, JLOT, DST, COWAT, ACTT, and FST. Patients and HC were compared regarding demographic, clinical features and neurocognitive tests. Also correlation between disease duration, disability index and self report -VAS were assessed. Results: There was no difference between patients and HCs regarding socio-demographic variables such as age, gender and years of education (p levels were 0.36, 0.436, 0.869; respectively). All of the patients were assessed at the peak of botulinum toxine effect and they were not taking an anticholinergic agent or benzodiazepine. Dystonia patients had significantly impaired verbal learning and memory (RAVLT, $p<0.001$), divided attention and working memory (ACTT, $p<0.001$), attention speed (TMT-A and B, $p=0.008$, 0.050), executive functions (PASAT, $p<0.001$; SDMT, $p= 0.001$; FST, $p<0.001$), verbal attention (DST, $p=0.001$), verbal fluency (COWAT, $p<0.001$), visio-spatial processing (JLOT, $p<0.001$) in comparison to healthy controls. But focused attention (STROOP-spontaneous correction) was not different between two groups ($p>0.05$). No relationship was found regarding disease duration and disability index with any neurocognitive tests. Conclusions: Our study showed that neurocognitive functions of dystonia patients were worse than control group with the similar age, sex, and education independently clinical expression like disease duration and disability index. This situation may be the result of possible cortical and subcortical changes in dystonia patients. Advanced neuroimaging techniques might be helpful to explain these changes in cervical dystonia patients.

Keywords : cervical dystonia, neurocognitive impairment, neuropsychological test, dystonia disability index
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