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Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

Letter to the Editor

Executive dysfunction in COVID-19 patients

**Keywords:**

Coronavirus disease 2019 (COVID-19)
Dysexecutive syndrome
Cognitive disorders

Dear Sir,

Executive function disturbances (“dysexecutive syndrome”) have usually been associated with frontal lobe pathology [1,2]. The dysexecutive syndrome includes attention control defects, difficulties in planning, abstracting, behavioral control, and orientation [3]. Defects in both cognition and behavior can be found. Specific characteristics of the dysexecutive syndrome depend upon the location, extension, and side of the pathology.

Impairments in executive functions have been documented in a diversity of conditions including but not limited to subcortical pathologies [4], neurodevelopmental disorders [5], psychiatric disorders such as depression and schizophrenia [6], and substance abuse [7,8]. Executive dysfunction is also found in dementia, traumatic head injury, and other conditions associated with diffuse brain abnormalities.

As the pandemic of SARS-CoV-2 infection continues to unfold, various neurological manifestations are coming to light [9]. Neurological manifestations can be subdivided into the central nervous system (headache, dizziness, alteration of the sensorium, ataxia encephalitis, stroke, and seizures) and the peripheral nervous system (skeletal muscle injury and peripheral nerve involvement including hyposmia and hypogeusia) symptomatology. Sometimes neurological features may precede typical respiratory symptoms. However, neuro-cognitive syndromes as a consequence of COVID-19 have not received adequate attention thus far.

A detailed review of the COVID-19 literature reveals at least one report explicitly referring to a dysexecutive syndrome documented in 14 out of 39 patients (36% of the cases) [10]. However, multiple papers refer to confusion and attention difficulties [10–13] in the affected patients, suggesting a dysexecutive syndrome.

Furthermore, encephalopathy has been frequently mentioned in cases of infections with COVID-19 [14–16]. It is known that encephalopathy is usually associated with generalized cognitive disturbances, including executive function disturbances [17,18].

The previous information suggests that in a significant number of cases COVID-19 infection may be associated with an executive dysfunction syndrome.

In addition, acute respiratory distress syndrome (ARDS), which as a pulmonary manifestation has received much attention during

this pandemic, can lead to long-term cognitive impairments. A very recent study points out that survivors of ARDS, particularly those who have been on mechanical ventilation may develop neuro-cognitive symptoms in the long run [19]. Although the paper does not elaborate on the type of cognitive difficulty experienced by this group of patients, a personal communication with the corresponding author of the paper reveals that majority of the study participants had either attention impairment or dysexecutive symptoms, suggesting a frontal lobar dysfunction in either case.

Both in acute phase as well as in the long run, executive dysfunction may be anticipated to be a part of neurological consequences of this viral infection.

Declaration of competing interest

The authors declare that they have no conflict of interest.

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3 July 2020