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LONG TERM IMPACT OF THE COVID-19 ON COGNITION: WHAT IS THE ROLE OF THE DISEASE SEVERITY?

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Introduction

COVID-19, the disease caused by the SARS-Co2 virus, affects multiple organs, including the central nervous system (CNS). Some of those effects will resolve themselves, but others may be long-term and even chronic. It seems logical to think that patients with severe forms of COVID-19 will have more chronicity. Admission to the intensive care unit (ICU) produces sequelae in patients due to the disease itself and the bed and treatment and affects cognition up to 5 years after discharge. However, available data show that not only critically ill patients who have suffered COVID-19 present sequelae or persistent symptoms. The post-COVID syndrome (PCS) is common in young patients with good health and physical condition before infection. Existing data on the incidence and course of post-COVID cognitive impairment are heterogeneous because the studies used samples that mix patients of varying severity (critical and moderate to mild forms of COVID).

We aimed to determine if there are differences in cognitive impairment concerning the severity of COVID-19.

Methods

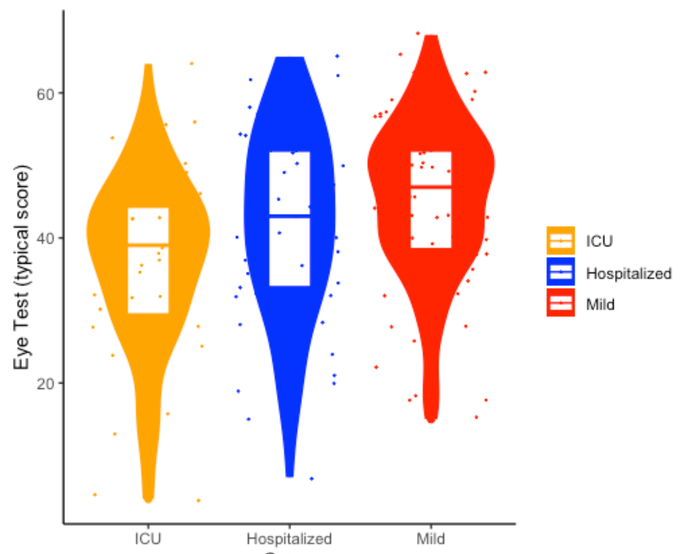
The sample consists of 214 participants with PCS (according to NICE) recruited from Neuropsychology and COVID Units from 17 Hospitals in Catalonia, Madrid, Galicia, and Andorra in the mark of the Nautilus Project (*ClinicalTrials.gov* IDs: NCT05307549 and NCT05307575). The participants were classified in three groups according to the severity of the COVID-19: critically ill (ICU) (N=65, female= 38%, mean age= 53.03, SD= 8.90; mean years of education= 12.78, SD=3.15), hospitalized without ICU (N=50, female= 42%, mean age= 52.63, SD= 9.38; mean years of education= 12.86, SD=3.69), and mild (have had the disease at home) (N=99, female= 79%, mean age= 45.84, SD= 10.08; mean years of education= 13.71, SD=3.13).

We performed a comprehensive neuropsychological evaluation, including attention and working memory, episodic memory, executive function and social cognition. We used the score from the vocabulary subtest of the WAIS-IV to measure premorbid intelligence. The alpha level was set at p=.05. Statistical analyses were performed in IBM SPSS Statistics 27 and R.

Results

As expected, age and sex differed between the groups, with a higher frequency of older men in the ICU group. The typical vocabulary subtest score was also significantly lower in the ICU group than in the hospitalized and mild groups. ANCOVA analysis was made to compare the cognitive variables between groups. After adjustment for age, sex, and vocabulary score, there was a statistically significant difference in social cognition $F(2, 197) = 3.656$, $p < .028$, partial $\eta 2 = .036$. Post hoc analysis was performed with a Bonferroni adjustment. Scores of "Reading The Mind in the Eyes" test were statistically significantly greater in the mild group vs the ICU group (Mdiff = 6.043, 95% CI [1.476, 10.610], $p < .028$).

	ICU		Hospitalized		Mild				
	N	M (SD)	N	M (SD)	N	M (SD)	F	P	η^2
Age	65	53.03 (8.90)	50	52.63 (9.38)	99	45.84 (10.08)	14.69	<.001	.122
Years of education	64	12.78 (3.15)	50	12.86 (3.69)	94	13.71 (3.13)	2.34	.098	.022
Vocabulary (scalar score)	64	9.88 (4.17)	50	10.82 (3.77)	99	12.15 (3.08)	8.03	<.001	.071
Eyes Test (typical score)	64	36.67 (12.15)	50	41.8 (13.20)	99	45.20 (10.92)	10.05	<.001	.087
		N (%)		N (%)		N (%)	X^2	p	
Sex (Female)	65	25 (38)	50	21 (42)	99	79 (79)	34.83	<.001	



Conclusions

As described in the literature, the cognitive impairment of the PCS does not seem to be related to the severity of COVID-19. However, our results show that the affectation of social cognition is associated with the greater severity of the disease. Additional analyzes of the project data are needed to elucidate more factors involved in the impaired social cognition of PCS.

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