AS22-001. SCREENING FOR COGNITIVE IMPAIRMENT WITH THE MONTREAL COGNITIVE ASSESSMENT IN SPANISH PATIENTS WITH MINOR STROKE OR TRANSIENT ISCHAEMIC ATTACK: A VALIDATION STUDY.

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Background and Aims: The symptoms of a minor stroke and transient ischemic attack (TIA) are temporary and mild. Despite the transient nature of focal symptoms and the absence of visible brain lesions in some patients, many experience persistent cognitive problems afterward. We aimed to establish the cut-off point of the Montreal Cognitive Assessment (MoCA) in screening for cognitive impairment within 90 days of TIA.

Methods: A total of 50 acute mild ischaemic stroke and TIA patients were recruited. They received the MoCA test and a formal neuropsychological evaluation. The cognitive impairment was defined clinically by a formal neuropsychological test battery (NEURONORMA). The Neuronorma Battery includes the selection of frequently used tests that covers the main domains of cognitive abilities: attention, work memory, mental control, psychomotor speed, language, visuo-perceptive and constructive capacities, memory and executive functions.

The Montreal Cognitive Assessment (MoCA) is a brief 30-question test that takes around 10-12 minutes to complete. Scores on the MoCA range from zero to 30, with a score of 26 and higher generally considered normal. The scoring breakdown is as follows: Visuospatial and Executive Functioning: 5 points; Animal Naming: 3 points; Attention: 6 points; Language: 3 points; Abstraction: 2 points; Delayed Recall (Short-term Memory): 5 points; Orientation: 6 points. Education Level: 1 point is added to the test-taker's score if he or she has 12 years or less of formal education.

Table 2. Score of the domains of the MoCA test in the total of patients with minor stroke and TIA, according to the presence or absence of cognitive impairment based on the neuropsychological examination

Domains	Scoring	Total N (%)	NCI N (%)	CI N (%)	p
Visuospatial and Executive	5	4,0 (1,1)	4,7 (0,6)	3,8 (1,1)	0,001
Animal Naming	3	2,9 (0,3)	3,0 (0,0)	2,9 (0,3)	0,044
Attention	6	4,9 (1,4)	5,5 (0,8)	4,7 (1,5)	0,018
Language	3	2,2 (0,7)	2,6 (0,5)	2,1 (0,7)	0,030
Abstraction	2	0,8 (0,8)	1,1 (0,8)	0,8 (0,7)	0,233
Delayed Recall	5	1,8 (1,7)	2,7 (1,7)	1,5 (1,6)	0,026
Orientation	6	5,8 (0,6)	5,7 (0,8)	5,8 (0,4)	0,435

Table 3. Discriminant indices of MoCA in detecting cognitive impairment at 90 days in patients with minor stroke and TIA.

Cutoff score	Se (%)	Sp (%)	PPV(%)	NPV (%)	LR +	LR-
<= 23,00	37,8	100,0	100,0	36,1	.	1,61
<= 24,00	56,8	92,3	95,5	42,9	7,38	2,13
<= 25,00*	78,4	76,9	90,6	55,6	3,40	3,56
<= 26,00	83,8	53,8	83,8	53,8	1,82	3,32
<= 27,00	91,9	38,5	81,0	62,5	1,49	4,74
<= 28,00	97,3	23,1	78,3	75,0	1,26	8,54

NPV, negative predictive value; PPV, positive predictive value; Se, sensitivity; Sp, specificity.

* A cut-off point of 25 on MoCAprovided good sensitivity and specificity

Results: The average age of recruited patients was 57.7±8.0 years, with the majority of patients being men (70.0%) and all patients with greater equal or than primary school level of education. Thirty-seven (74.0%) subjects were classified into Cognitive impairment (CI) group. The optimal cut-off point for MoCA in discriminating patients with CI from those with no cognitive impairment was 25 (sensitivity 78,4% (IC95%: 62,8 - 88,6%), specificity 76,9% IC95%: 49,7 - 91,8%), positive predictive value 90,6% (IC95%: 81,0 - 95,6%), negative predictive value 55,6% (IC95%: 39,5 - 70,4%), and the Receiver operating characteristic curve analysis (AUC) 0.835 (95%CI 0.720-0.949).

Table. Clinical characteristics of patients with acute mild stroke or TIA.

	Total N=50	No cognitive impairment n=13	Cognitive impairment n=37	p
Sex, men (%)	35 (70)	10 (76,9)	25 (67,6)	0,527
Age (year), mean (SD)	57,7 (8,0)	57,3(7,3)	57,8(8,3)	0,851
Residence urban (%)	28 (56)	10 (76,9)	18 (48,6)	0,077
Education				
• Primary school and below (%)	25 (50)	6 (46,2)	19 (51,4)	0,926
• Middle and high school (%)	22 (44)	6 (46,2)	16 (43,2)	
• Bachelor and above (%)	3 (6)	1 (7,7)	2 (5,4)	
Etiology				
• atherosclerosis (%)	9 (18)	1 (7,7)	8 (21,6)	0,247
• cardioembolism (%)	4 (8)	0 (0,0)	4 (10,8)	
• Small artery occlusion (%)	12 (24)	5 (38,5)	7 (18,9)	
• undetermined(%)	22 (44)	7 (53,8)	15 (40,5)	
• other (%)	3 (6)	0 (0,0)	3 (8,1)	
Medical history				
Number of risk factors, mean (SD)	3,4 (1,7)	3,2 (2,4)	3,4 (1,5)	0,709
Hypertension (%)	29 (58)	6 (46,2)	23 (62,2)	0,314
Diabetes (%)	14 (28)	5 (38,5)	9 (24,3)	0,329
Hyperlipidaemia (%)	19 (38)	5 (38,5)	14 (37,8)	0,968
Atrial firbillation (%)	4 (8)	0 (0,0)	4 (10,8)	0,216
Coronary heart disease (%)	5 (10)	1 (7,7)	4 (10,8)	0,747
Smoking (%)	30 (60)	8 (61,5)	22 (61,1)	0,978
Alcohol (%)	20 (40,8)	7 (53,8)	13 (36,1)	0,265
Depresion (%)	1 (2)	1 (7,7)	0 (0,0)	0,260
Family history of stroke (%)	14 (28)	5 (38,5)	9 (24,3)	0,474
Family history of dementia (%)	13 (26)	3 (33,3)	9 (24,3)	0,539
Neuroimage				
DWI positive (%)	42 (84)	9 (62,2)	33 (89,2)	0,231

Figure. Receiver operating characteristic (ROC) analysis of Montreal Cognitive Assessment (MoCA) for differentiating patients with cognitive impairment from patients without cognitive impairment (Se 78,4%, Sp 76,9%, area under curve = 0.835).

Conclusions: More than half of the sample had cognitive impairment as determined by the formal battery of neuropsychological tests. A MoCA cut-off score of 25 is optimally sensitive and specific for detecting MCI after mild stroke or TIA in the subacute stroke phase. Therefore, it should be implemented in routine clinical practice.