Performance of the CPSSS in pre-hospital care to detect cerebral infarction related to proximal arterial occlusion

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Key findings

- ✓ Regulation and referral of stroke patients eligible for thrombectomy
- ✓ Pre-hospital diagnostic test evaluation: Cincinnati Prehospital Stroke Severity Scale (CPSSS), 3-Item Stroke Scale (3I-SS), Prehospital Acute Stroke Severity (PASS), Los Angeles Motor Scale (LAMS) and the G-FAST

Background

The prehospital management of acute stroke suspicions represents a major issue, due to time-dependent efficiency of reperfusion treatments (thrombolysis and Endovascular thrombectomy (EVT) which can only be performed in an EVT-center). The main pre-hospital stroke management challenge is to adequately orient patients to EVT or non-EVT-centers in order to avoid a loss of chance. Our main objective was to evaluate the performances of the CPSSS to identify strokes eligible for thrombectomy.

Methods

- **Study Design:** Prospective diagnostic study
- **Population:** consecutive patients with a suspicion of stroke in the acute phase during the pre-hospital contact, by telephone with a medical regulator in a French emergency call center
- **Analysis:** Scores were rated by the medical regulator by telephone with the firefighters or paramedics who were on-site with the patient. The gold standard for confirming proximal occlusion was brain imaging. CPSSS score ranges from 0 to 4; composed and scored by 3 items: conjugate gaze (2pnts), arm weakness (1pnt) and abnormal level of consciousness commands and questions (1pnt). It will be considered positive if it is greater than or equal to 2.

Criteria	CPSSS	3I-SS	PASS	LAMS	G-FAST
Gaze palsy/deviation	X	X	X		X
LOC* Commands	X				
LOC* Questions	X		X		
LOC* Responsiveness		X			
Arm weakness	X		X	X	X
Hemiplegia		X			
Facial droop				X	X
Speech disorders					X
Grip strength				X	

* Level Of Consciousness

Results

This intermediate analysis was conducted on the first 490 included patients, out of 1220 expected. This sample included 247 confirmed ischemic strokes (IS). Among patients with IS, 107 (43.3%) presented proximal occlusion. The sensitivity of the CPSSS was 0.61 95%CI [0.51-0.70], the specificity was 0.78 95%CI [0.73-0.82].

Scales	Sensitivity	Specificity	PPV	NPV	LR+	LR-
CPSSS (95% IC)	0,61 (0,51 - 0,70)	0,78 (0,73 - 0,82)	0,43 (0,35 - 0,51)	0,88 (0,84 - 0,91)	2,71	0,51
3I-SS (95% IC)	0,13 (0,03 - 0,32)	0,94 (0,86 - 0,98)	0,38 (0,09 - 0,76)	0,78 (0,69 - 0,86)	2	0,93
PASS (95% IC)	0,75 (0,53 - 0,90)	0,59 (0,47 - 0,70)	0,35 (0,22 - 0,50)	0,89 (0,77 - 0,96)	1,82	0,43
LAMS (95% IC)	0,91 (0,72 - 0,99)	0,63 (0,52 - 0,74)	0,42 (0,16 - 0,32)	0,96 (0,87 - 0,99)	2,49	0,14
G-FAST (95% IC)	0,71 (0,49 - 0,87)	0,68 (0,56- 0,78)	0,40 (0,25 - 0,56)	0,89 (0,78 -0,95)	2,18	0,43

Conclusion:

Based on these preliminary results, the CPSSS appears to have limitations for predicting proximal occlusion. Other scores (3I-SS, PASS, LAMS and G-FAST) may also be tested.