

## PRE-HOSPITAL ASSESSMENT OF SUCCESS AND VALIDITY OF SCALES OF STROKE AND TIA

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### Abstract

**Introduction:** cerebrovascular disease is the most frequent cause of death in Argentina in 2004, it cause 7.5% of total deaths. The American Heart Association proposes using Cincinnati Prehospital Stroke Scale (CPSS) and Los Angeles Prehospital Stroke Screen (LAPSS) to evaluate cerebrovascular cases.

**Objective:** is to evaluate the awareness of knowledge of these scales between doctors working in emergency rooms and prehospital consultation and range of usefulness of these scales.

**Material and Method:** Observational and prospective survey of 569 doctors from the Argentinian provinces of Santa Fe, Rios, and Chaco from December 2008 to March 2009.

**Results:** One third of doctors declared to know the scales, but 8.4% could enumerate CPSS points, while 1.9% could enumerate LAPSS points with 0.7% remembered both CPSS and LAPSS points. Those who remembered either one or both scales felt safer evaluating a possible stroke ( $p= 0.02$ ). Those who felt more hesitant were the doctors who described more benefits to the scales ( $p= 0.0003$ ). Non specialists considered scales more useful

**Conclusion:** Both scales were valued by doctors to diagnose patients with possible stroke. We try to stress the need of a widespread coverage of these scales to improve the initial approach for managing these patients.

**Keywords:** stroke, Los Angeles Prehospital Stroke Screen, Pre-hospital Stroke Scale, emergency room, doctors on call.

### Introduction

Stroke - CVA, stroke, or stroke in the English-speaking literature - it is a frequent and increasing pathology, among other reasons for the increase in the life expectancy of the population, and due to difficulties in controlling cardiovascular risk factors. It is also an important cause of morbidity and mortality. According to statistics from the National Institute of Statistics and Censuses (INDEC) of Argentina, diseases of the circulatory system constituted in 2004 the most frequent cause of mortality (30.9%), a figure that practically doubled the total deaths caused by all malignant tumors (18.7%). Similar percentages were observed at analyze the causes

of mortality according to sex, being something the higher the cardiovascular mortality / neoplasm ratio evil among women. According to this report stroke accounted for 7.5% of the total of deaths in our country in that period; although not we have data regarding morbidity caused by this condition, it is possible to assume that it has been considerably higher.

Despite the usual picture, the currently available treatments continue to be hardly applicable to most patients who suffer from it, due to in part to the limited "therapeutic window" for its use, as well as difficulties and delays in the frame detection. Such is the importance of this pathology that the American Heart Association (AHA) in its 2005 guide on Cardiovascular Resuscitation, proposes

the use of of pre-hospital assessment scales for patients with suspected stroke, as a validated method to quickly, easily and safely assess subjects with this possible diagnosis.<sup>1</sup>

This recommendation was ratified in the 2010 update of the same guide. The presence of a single abnormality in the Cincinnati Prehospital Stroke Scale (CPSS) has a reported sensitivity of 59% and a specificity of 89% for the detection of stroke. Likewise, an abnormality in the 3 points of this scale indicates greater than 85% probability that the subject is having a stroke. For its part, the Los Angeles Stroke Prehospital Assessment Scale (LAPSS) has a sensitivity of 93% and a specificity of 97% for the detection of the mentioned box. In the absence of useful and universally applicable treatments, timely diagnosis and early and adequate treatment of the condition constitute the best strategies, together with primary prevention, to improve the prognosis and survival of patients with ACV.

Therefore, we set out to study the degree of security experienced by doctors on duty when evaluating patients who could potentially be suffering a stroke, as well as the knowledge of the scales proposed by the AHA for the detection initial of this pathology.

#### Material and Methods

**Design:** Prospective, analytical, observational study carried out during the months of December 2008 to March 2009 in cities of three provinces of the republic Argentina: Rosario, Santa Fe (capital), Santo Tomé, Es peranza, Coronda, Gálvez and Laguna Paiva (province of Santa Fe), Paraná (capital of the province of Entre Ríos) and Resistencia (capital of the Chaco province).

**SAMPLE:** A non-probabilistic convenience sampling was carried out through which 569 doctors were surveyed on-call personally and individually,

**Tool:** through a closed and fixed questionnaire; the slopes were performed by advanced students of Medicine (5th year or higher) of the Faculty of Sciences Doctors from the National University of Rosario, or by doctors graduated from said institution (see list of collaborators).

#### Inclusion and exclusion criteria:

Inclusion criteria: physicians who worked regularly or sporadically in services of emergencies, both public and private, on guard external, ambulances - both simple and transport of critical patients- and / or those who made consultations domiciliary.

Exclusion criteria: - doctors who performed only shifts in critical care units (intensive care unit, coronary, intermediate care) or inpatient guards in the general ward.  
- Doctors who, despite working in emergency services, only attended pediatric patients.

To answer question No. 4, where respondents were asked if they considered that the scales CPSS and LAPSS would bring some benefit to their professional practice, it was delivered and explained to each interviewee a copy of them, allowing them to analyze them the time they consider necessary before enunciating your answer. All participants were asked to did not disseminate the scales until after 3 months after the interview, with the aim of not biasing the future participants.

#### Statistic analysis

The analysis of the data obtained was carried out with Epi Info version 6.0. Continuous variables are represented as mean and standard deviation, while qualitative ones are expressed as frequencies and percentages. In the case of the latter, the comparisons are performed by Pearson's Chi-square tests and Fisher's exact probability. Statistical significance was  $p < 0.05$ .

#### Results

Of the 569 physicians surveyed, 53.8% (306) they were male. The age of 568 was obtained participants; the mean of it was  $32.6 \pm 7.8$  years, with a minimum of 24 years, the maximum age being 67 years. The average number of years received was 6, with a minimum of 6 months and a maximum of 40 years approximately. Regarding the training of the surveyed physicians, 30.6% (174) were specialists in various areas, 36.2% (206) were doing some specialty and 33.2% (189) did not have a specialty or were not doing it.

The approximate distribution of the different specialties of the participants, without discriminating between residents and specialists, 58% (330) of the surveyed physicians worked in only one type of place, namely: general guards, ambulances, home consultations or other types of activity. 28.6% (163) worked in 2 places and the remaining 13.4% (76) worked in 3 or more different locations. 84.2% (479) of the total worked in general guards, 29% (165) worked in ambulances, 17.6% (100) made home visits and 26.4% (150) reported doing other types of work.

When asked about the degree of safety they experienced when evaluating a patient with possible stroke, 53.8% (306) were showed moderately safe, 38.5% (219) expressed feeling very safe and 7.7% (44) stated feel insecure. 32.3% (184) expressed knowing at least one of the scales under study; however only 8.4% (58) could correctly mention CPSS, 1.9% (11) did with LAPSS and 0.7% (4) correctly mentioned both. The remaining 88.9% (506) could not mention the points of any of the scales, or they did so incomplete form.

When the knowledge of any or both scales with the degree of security they expressed physicians when evaluating patients with a possible cerebrovascular accident, no

statistically significant difference was reached ( $p = 0.23$ ); **See Table I.** However, when observing it, it can be noted that none of the interviewees who knew the LAPSS scale,

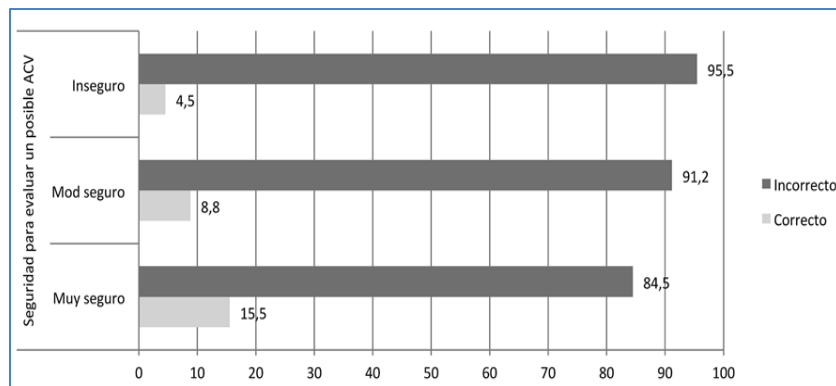
either in isolation or in conjunction with CPSS, expressed feeling insecure.

**Table 1:**

Question 1	Very sure	Moderately safe	unsafe	total
Correctly LAPSSa	6	5	0	11
Correctly CPSSb	25	21	22	48
Correctly both				
Incorrectly / don't know / don't know	3	1	0	4
total				

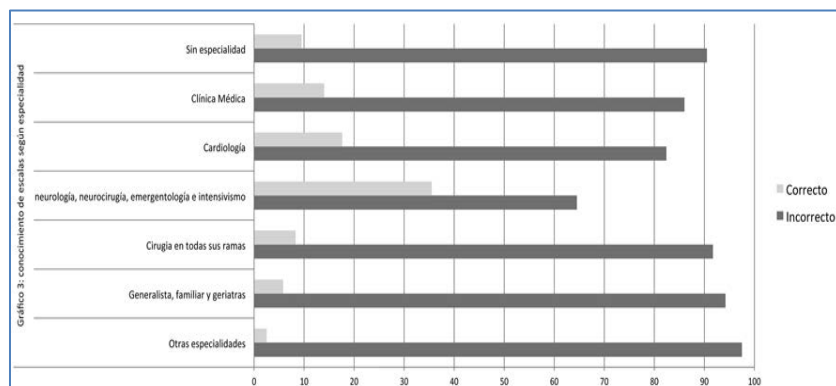
**Table 1**

When comparing the knowledge of any of the two scales versus the lack of knowledge of them, a statistically difference was achieved significant in the degree of security expressed by the participants ( $p = 0.02$ ); **figure 1** When the degree of knowledge of the scales was compared in a discriminatory way according to specialty, a statistically significant difference was observed in favor of the group of neurologists, neurosurgeons, emergentologists and intensivists compared to the rest of the respondents ( $p < 0.001$ ); **figure 2**



**Figure 1: Relationship between knowledge of the scales and degree of safety in the assessment of stroke.**

89.3% (508) of the surveyed physicians answered that they considered that using the scales could benefit their daily practice, 9.8% (56) answered that they the opposite way, and 0.9% (5) did not give an answer conclusive about it.



**Figure 2: Knowledge of scales according to specialty.**

When the degree of safety of those surveyed in the evaluation of patients with possible stroke was related, regarding their opinion of the potential utility of the CPSS and LAPSS scales, it was found that those who referred less security believed that they would be of higher value ( $p = 0.0003$ );

When comparing the subgroup of neurologists, neurologists, emergentologists and intensivists with the rest of the respondents, the first found the scales less useful, with a difference that was statistically significant ( $p = 0.002$ ); Similarly, among the doctors who were performing a specialty, 95.1% (176) believed that the scales

They would be of value to them, while among those with full specialty, 87.6% (332) answered affirmatively to this ( $p = 0.005$ ).

Continuous training-update topic aimed at on-call doctors and focused on the practical and adequate management of the most frequent pathologies, while 0.9% (5) did not think this way, and 0.5% (3) gave an ambiguous answer about it.

### Discussion

CVA is a common pathology; however, the majority of the surveyed physicians stated that they felt insecure or moderately safe when evaluating patients who could potentially suffer from this pathology. Due to the fact that the surveys were carried out in person and in person, mostly in the workplaces of the subjects, there is the possibility that the degree of insecurity experienced by them is even greater than that reported. Several scales have been proposed to evaluate the *quick and easy mode patients with*

The CPSS and LAPSS scales have been the most widely used and validated, 7-9 and are those recommended in the guide of the AHA.<sup>1,2</sup> For its part, the guide of the National Institute of Excellence in Health and Clinic (NICE) in English)<sup>4</sup> does not refer to these scales, but proposes the use of two others: the FAST (Face Arm Speech Test) and the ROSIER (Recognition of Stroke in the Emergency Room).<sup>3,4,6,10</sup> The FAST scale is a modification, without substantial changes, of the CPSS scale. The ROSIER scale was developed after the rest of the themselves; a recent work<sup>11</sup> that compared the latter, more complex, with the FAST scale, concluded that the same was not superior to the FAST, and the second would be preferred due to its greater simplicity.

It would seem correct to ask ourselves, given the availability of several scales, and taking into account the fact that There is no unanimous consensus between companies regarding which to recommend, if any of them is superior to the rest. A study tried to answer this question by comparing the CPSS scales prospectively, FAST,

LAPSS and Melbourne Ambulance Stroke Screen);<sup>12</sup> according to this study, the first two showed high sensitivity but relatively low specificity.

By contrast, the Melbourne and LAPSS scales presented lower sensitivity but higher specificity than the previous ones. An additional fact is that the items of all the scales related to the patient's history were less relevant than the findings of the physical exam to predict the occurrence of a stroke. Weighed to this, the authors conclude that it is not possible to determine which scale is superior. In our case we opted for investigate the degree of knowledge of the CPSS scales and LAPSS, as they are widely validated, being simple to remember and put into practice.

In 2009 a study<sup>13</sup> was published in which paramedics were instructed in the use of the scale CPSS for the evaluation of out-of-hospital patients; their performance was analyzed, retrospectively and prospectively, in the diagnosis of stroke.

It was concluded that training in the use of the CPSS scale did not provide improvements in the diagnostic process. However, it should be considered that said study took as recipients to paramedics, who have a training other than medical, focused mainly on emergency management. It is possible, therefore, that they resemble, from the point of view of the evaluation of patients with suspected stroke, when subgroup of emergentologists.

In our country we still do not have, in general terms, a number of mere adequate paramedics inserted into the system of health; on the other hand, the specialty of emergentology is not sufficiently widespread. Thus, the most of those who perform external guard work or out-of-hospital care are not trained specifically for that purpose. We think this could account, at least partially, of the difference with the work previously cited, since in our series the majority of respondents believed that the scales they would be useful for your practice. Nor can it be ignored that the design of our study does not allow assess the value of the scales to modify the initial assessment of patients with suspected accidents cerebrovascular. Although the majority opinion favorable of the surveyed physicians is a fact of value, constitutes an indirect data with respect to the real utility of scales.

An additional fact in our study and what this position would have is that almost all participants from work agreed with the idea that there should be a training / updating system continuous for doctors on call. They were not found differences between specialists and non-specialists in this respect. New studies are needed to elucidate The true utility of stroke patient assessment scales in our setting.

On the other hand, the only measure that has so far shown to substantially change the evolution of patients with an

established stroke is performing thrombolysis.<sup>14</sup> However, the greater limitation of this treatment is its limited therapeutic window. It is imperative, therefore, to optimize the time and diagnostic precision of patients with stroke, in order to avoid delays that could prevent a subject from being a candidate for this treatment.

A study carried out in our country and published in 2008 found that less than 6% of the stroke patients were admitted to a "Unit of Stroke", and that only about 1% received lithic thrombus.<sup>15</sup> Since the vast majority of patients with stroke will be evaluated initially by non-medical doctors specialists, or whose specialty is not the specifically related to *we consider that the ,this pathology reviously mentioned scales may result from inestimable .value*

*we believe it is appropriate to mention ,Finally e form to th Because .of selection of the participants that there is no adequate registry of the doctors of who usually ,guard work in various and even often move outside their ,sites city and that it is a common ,to practice their profession practice ut sporadic jobs in places wherercarrying o usually it was not possible ,do not perform perform probability ,This eventuality .sampling partially remedied by sample size largely prevents the generalization of ,obtained the .conclusions of the present work*

### Conclusions

*a considerable variety of specialties was ,In our work with ,call doctors-observed among on a not inconsiderable They .number of professionals without specialization expressed feeling mostly only moderately safe when evaluating patients with a .stroke possible At the same we found a high lack of knowledge of the CPSS and ,time Those who knew any of them were more .LAPSS scales confident in the evaluation of patients with suspected being ,stroke Doctors who .this statistically significant eatest insecurity were those who expressed the gr considered that the scales would be of greater value to their practice When analyzing the assessment of .everyday the utility of scales according to the specialty of the doctors it was observed e than those more related to th ,that is ,pathology ,neurosurgeons ,neurologists and intensive care practitioners ,emergentologists Something similar .considered them to be less useful occurred when the opinion of doctors was compared with full specialty versus those who were While .same doing the of the participants %89 thought that the scales would be of ,value for his practice this would suggest a greater utility of the same between those physicians less familiar with this .pathology*

*We therefore believe it convenient to promote the dissemination of the initial assessment scales for patients with with the aim of improving the ,suspicion of stroke*

*.diagnosis of this pathology New studies are needed in order to elucidate the*

*and the impact of their systematic ,true role of the scales .plication by doctors on dutyap*

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