

# Determinants of Emergency Medical Services Use in a Brazilian Population with Acute Ischemic Stroke

Gustavo W. Kuster, MD,\* Monique Bueno Alves, RN,\*  
Miguel Cendoroglo Neto, MD, PhD,\* and Gisele Sampaio Silva, MD, PhD\*†

---

Emergency medical services (EMS) plays a key role in the recognition and treatment of stroke. This study evaluates the determinants of EMS use in a Brazilian population with acute ischemic stroke. We performed a post hoc analysis of prospectively collected data of consecutive patients admitted to a Brazilian tertiary hospital with acute ischemic stroke. Groups were compared according to their mode of arrival to the hospital: those brought by EMS and those arriving at the hospital by their own means. Among 165 patients evaluated between January and December 2009, 17.6% arrived by EMS and 82.4% arrived by their own means. After multivariate adjustment, individuals with higher National Institutes of Health Stroke Scale score at presentation (odds ratio [OR], 1.15; 95% confidence interval [CI], 1.06-1.23 for each point on the National Institutes of Health Stroke Scale score) were more likely to use EMS, as were those with atrial fibrillation (OR, 5.8; 95% CI, 1.41-24.07) and with lower blood pressure at hospital admission (OR, 0.72; 95% CI, 0.56-0.93 for each mm Hg). Patients brought by EMS had trends toward a lower door-to-neuroimaging time and a higher frequency of thrombolysis therapy (13% in EMS users vs 5% in patients arriving by their own means;  $P = .10$ ). Our data demonstrate that in a Brazilian population with acute ischemic stroke, the patients with more severe stroke, those with atrial fibrillation, and those with lower blood pressure at hospital presentation were more likely to use EMS. EMS use was associated with trends toward a lower door-to-neuroimaging time and a higher frequency of thrombolysis therapy. **Key Words:** Mode of arrival—cerebrovascular diseases—Brazil.

© 2013 by National Stroke Association

---

Early admission to the hospital with minimum delay is a prerequisite for successful management of acute ischemic stroke. There is strong evidence that thrombolysis administered within an appropriate time window increases the likelihood of a favorable outcome.<sup>1-3</sup> Only a minority

of patients are eligible for this therapy, however, due mainly to prehospital and in-hospital delays.<sup>4,5</sup>

Emergency medical services (EMS) plays a key role in the recognition and rapid treatment of stroke. It is currently recommended that patients with symptoms and signs suggestive of stroke call for an ambulance immediately after symptom onset.<sup>6</sup> EMS has the advantage of alerting the hospital emergency department of the impending arrival of a patient with acute stroke, thereby avoiding unnecessary delays in the emergency room and radiology suite.<sup>5-7</sup> Hospital arrival is actually faster for patients with stroke symptoms who activate EMS than for those who contact their primary physician.<sup>8,9</sup> EMS use is also unequivocally associated with a decreased time to initial neuroimaging and neurologic evaluation.<sup>5-7,10</sup>

Approximately 29%-65% of patients with signs or symptoms of stroke access their initial medical evaluation via local EMS in the United States.<sup>11-16</sup> In studies of

---

From the \*Neurology Program and Albert Einstein Stroke Center, Albert Einstein Hospital, São Paulo, Brazil; and †Department of Neurology and Neurosurgery, Federal University of São Paulo, São Paulo, Brazil.

Received March 14, 2011; revision received August 22, 2011; accepted August 24, 2011.

Address correspondence to Gisele Sampaio Silva, MD, PhD, Neurology Program and Albert Einstein Stroke Center, Albert Einstein Hospital, 741 Altino Arantes Ave, Apt 81, São Paulo, SP, Brazil, 04042-033. E-mail: giselesampaio@hotmail.com.

1052-3057/\$ - see front matter

© 2013 by National Stroke Association

doi:10.1016/j.jstrokecerebrovasdis.2011.08.007

predictors of EMS use by patients with acute stroke in the United States, those who arrived by EMS had more severe deficits and were older, more likely to be black and unemployed, and more likely to have blood discernible on the initial computed tomography (CT) scan.<sup>11,15</sup> Knowledge of the factors influencing EMS activation for stroke in a country can allow for the development of interventions aimed at increasing EMS use locally. The determinants of EMS activation in patients with acute stroke in Brazil have not been studied previously. The aim of the present study was to evaluate the determinants of use of EMS in a Brazilian population with acute ischemic stroke.

## Patients and Methods

We evaluated consecutive patients with acute ischemic stroke admitted to a Brazilian tertiary hospital within 24 hours of symptom onset or last seen well between January and December 2009. Albert Einstein Hospital is a tertiary care facility certified by the Joint Commission International, with 542 beds at the time of this study. Approximately 200 patients with a discharge diagnosis of stroke are admitted through the emergency department each year. Although a population of approximately 1 million people has potential access to the hospital, in the hospital's neighborhood there are a total of 923 hospital beds that can potentially serve patients with stroke. Thus, the number of patients admitted with stroke annually is modest.<sup>17</sup>

Data were extracted and reviewed from an ongoing prospective institutional outcomes database monitored as part of a quality assurance/quality improvement program for stroke treatment. As part of our stroke program, all patients admitted with a diagnosis of ischemic stroke are notified and followed daily by a case manager nurse. Our stroke team consists of board-certified neurologists trained in acute stroke care in house 24 hours per day, 7 days a week. The hospital has a written protocol available for acute stroke care, a dedicated interventional neuroradiologist team available around the clock, advanced neuroimaging capability (including CT, CT angiography, and CT perfusion, with the CT scanner located at the emergency department, and acute magnetic resonance imaging [MRI]), and a critical care unit with 8 beds dedicated to neurologic and neurosurgical patients. All neurologists are certified to perform administer the National Institutes of Health Stroke Scale (NIHSS) and undergo periodic training program and protocol review. Our stroke program is the only Latin American service certified as a Primary Stroke Center by the Joint Commission International.

Data collected included demographic information, mode of arrival (EMS vs patient's own means), presence of stroke risk factors, NIHSS score, modified Rankin scale (mRS) score at discharge, neuroimaging characteristics,

and thrombolysis status using a standardized, structured questionnaire. Risk factors were considered if noted on the patient's chart or if medications for known risk factors were used before hospital admission or at discharge. Data were collected by trained nurses and research coordinators and controversies were discussed with the attending physician or with a stroke neurologist. Patients with intracranial hemorrhage, transient ischemic attack, in-hospital stroke, or an alternative cause for the neurologic symptoms were excluded.

Head CT and/or brain MRI was performed in all cases. CT scans were obtained using the orbitomeatal line. All CT scans were interpreted using the Alberta Stroke Program Early CT Score (ASPECTS) method. The ASPECTS was determined from 2 standardized axial CT cuts, one at the level of the thalamus and basal ganglion and the other adjacent to the most superior margin of the ganglionic structures.<sup>18</sup>

Admission time was recorded for each patient. The time of symptom onset or time last seen well was obtained from the patient or an available witness. The door-to-neuroimaging time (for all patients) and door-to-needle time (for patients treated with thrombolysis) were also recorded. At discharge, the patients were evaluated using the mRS.

Patients were classified into 2 groups according to whether they arrived at the hospital by EMS or by their own means. This study was approved by our hospital's Institutional Review Board.

## Statistical Analysis

Data are reported as mean  $\pm$  standard deviation (SD) or median and interquartile range (IQR). The independent-samples *t* test or the Mann-Whitney *U* test, as appropriate, was used to compare patients who arrived by EMS and those who arrived by their own means. Categorical variables were compared with the  $\chi^2$  test or Fisher's exact test. Multiple logistic regression was used to investigate the influence of epidemiologic and clinical data on EMS use and to investigate the influence of mode of arrival on discharge mRS scores dichotomized at 2 (mRS score  $\leq 2$  vs  $\geq 3$ ). All variables that showed an association in the univariate analysis with a *P* value  $\leq .10$  were included in the multivariate analysis. A 2-tailed *P* value  $< .05$  was considered statistically significant. All statistical analyses were performed with SPSS version 16.0 (SPSS Inc, Chicago, IL).

## Results

We evaluated 165 consecutive patients with acute ischemic stroke admitted to our hospital within 24 hours of symptom onset between January and December 2009. Of these 165 patients, 29 (17.6%) arrived by EMS and 136 (82.4%) arrived by their own means. The 2 groups were similar in terms of age, sex, time from symptom

Download English Version:

<https://daneshyari.com/en/article/2710928>

Download Persian Version:

<https://daneshyari.com/article/2710928>

[Daneshyari.com](https://daneshyari.com)