

Acceptance date: 19/12/2024

IMPACT OF EMERGENCY CARE UNITS AND SAMU ON THE TREATMENT OF ACUTE STROKE

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Abstract: Early treatment of stroke has a positive impact on the patient's functional outcome. Emergency transport services are of fundamental importance for rapid assessment and transfer to a referral center for stroke treatment. At the Hospital das Clínicas de Ribeirão Preto (Emergency Unit), patients are admitted regulated from a primary medical assessment unit or are brought directly via the Mobile Emergency Care Service (SAMU). **Objective:** to assess the impact of primary care units on the rate of thrombolysis and the final outcome of stroke treatment. **Methodology:** Patients admitted to the Emergency Unit over a period of one year, brought in by the SAMU or regulated from another care unit, were retrospectively evaluated. Data on reperfusion therapy (thrombolysis/thrombectomy) and stroke severity was collected from the REAVER (Ribeirão Preto Stroke Registry). **Results:** There was a higher prevalence of atrial fibrillation (37.5% versus 15.3% with $p < 0.001$) and heart disease (39.4% versus 21.5% with $p = 0.007$) in patients admitted to the SAMU. Patients admitted by the SAMU were significantly more severe NIH 16 [5-22] versus NIH 5 [3-13], with $p < 0.001$. At hospital discharge, patients admitted by the SAMU also had a higher NIH (3 [1-11] versus 2 [0-6]). **Conclusion:** The results show that SUS patients with ischemic stroke referred via the SAMU receive reperfusion therapy more often.

Keywords: Stroke, Emergency Care Units, SAMU, Outcome

INTRODUCTION

The rapid assessment and transportation of patients with suspected strokes is of clinical importance in terms of the patient's functional outcome, as it increases the chance of treatment. Since the introduction of thrombolytic therapy for ischemic stroke (rt-PA), this condition has been treated as time-dependent, since it must be used within 4.5 hours of the onset of symptoms. ^[1]

In the United States and Europe, the use of emergency transportation services is highly recommended, due to their efficient transportation and higher thrombolysis rates. ^{[2][3]}. As a result, organizations such as the American Stroke Association (ASA) have issued recommendations to make pre-hospital care more time-effective. With this, the service also becomes responsible for carrying out the pre-hospital assessment of the patient using scores such as the NIHSS and for notifying the referral unit of the arrival of the patient with suspected stroke, making the pre-hospital and in-hospital flow faster and more effective.

In Brazil, the mobile emergency service (SAMU) is the main emergency transportation service used to transport patients with suspected strokes. However, a large proportion of patients still go first to a primary or intermediate health unit (emergency care unit - UPA), which does not have the facilities to treat patients with suspected strokes, such as a CT scan of the skull or a neurologist.

Patients with suspected strokes can be taken to a primary or intermediate unit by their relatives and then transferred to a specialized treatment center. Another possibility is to be taken directly to a specialized treatment unit via SAMU.

OBJECTIVE

Evaluation of the clinical and epidemiological characteristics of stroke patients admitted to the Emergency Unit from home or from the Emergency Care Unit

METHODOLOGY

The study was carried out as a retrospective cohort, evaluating patients with strokes admitted to the Emergency Unit in the city of Ribeirão Preto in the period of 2017. The data was collected through REAVER (Ribeirão Preto Stroke Registry).

PATIENTS

Patients with CVA diagnosed by cranial CT (excluding patients with hemorrhagic stroke and stroke simulators), aged over 18, within the first 24 hours of symptom onset, will be included. Patients will be assessed for comorbidities, clinical manifestations, recanalization therapy (thrombolysis and/or thrombectomy) and NIHSS. Patients with hemorrhagic stroke or patients outside the city of Ribeirão Preto were excluded.

PRIMARY CARE

The patients were divided into two groups for analysis: patients regulated directly from the scene by the SAMU to the referral center and patients who were first seen at the UPA or another primary care unit.

STATISTICAL ANALYSIS

Continuous variables will be described as means and standard deviation or medians and respective interquartile ranges (IQR) and categorical variables will be described as percentages. Baseline characteristics will be assessed using the Student's t-test, X-test², Mann-Whitney U test and Fisher's test, as appropriate in the univariate analysis. Outcomes will be compared between groups using multivariate regression techniques. A p-value of less than 0.05 will be considered statistically significant.

RESULTS

A total of 209 consecutive patients admitted between January and December 2017 were assessed, with follow-up up to March 2018 (3 months after the last patient was discharged). Of the patients evaluated, 66 (31.4%) were admitted directly by SAMU and 143 (68.6%) had a first visit to a UPA or other health unit before being admitted to hospital.

Mean age, gender, hypertension, diabetes mellitus, dyslipidemia, smoking, Chagas disease and previous stroke were similar between the groups (there was no significant difference).

There was a higher prevalence of comorbidities such as atrial fibrillation and heart disease in the group of patients admitted by the SAMU. Atrial fibrillation (SAMU 37.9% and UPA 15.3% with $p < 0.001$) and heart disease (SAMU 39.4% and UPA 21.5% with $p = 0.007$).

Patients admitted directly by the SAMU were significantly more severe; NIH 16 [5-22] against NIH 5 [3-13], with $p < 0.001$. At hospital discharge, we also found a higher NIH in the SAMU patients, NIH 3 [1-11] versus 2 [0-6], with $p = 0.028$. There was no significant difference in blood pressure between the two groups,

The ASPECTS tomographic scale was similar between the groups (no significant difference).

With regard to hospitalization, patients brought in by the SAMU had a longer hospital stay; 9 (± 10) days compared to 7 (± 8) days, $p = 0.048$; and higher rates of hospital infection 31.8% compared to 17.5%, $p = 0.020$, but with no significant difference in relation to hospital death.

DISCUSSION

In the comparative analysis of the results collected, it is possible to see a statistically significant difference between the NIHSS on admission of patients who called SAMU and went directly to the Emergency Unit when compared to patients who first went to a UPA and were then regulated ($p = < 0.001$). As the patients admitted by the SAMU had a higher NIHSS (mean 16 [5-22]) and therefore a greater severity of the symptoms presented, it is inferred that the patients and family members had a greater sensory perception of the emergency presented to them. However, patients with milder symptoms, who had a lower mean

Features	Group studied		P Value
	SAMU	UPA	
	N = 66 (31,4%)	N = 143 (68,6%)	
Age (years)	73 (\pm 11)	69 (\pm 12)	0,63
Female	35 (53,0%)	65 (45,1%)	0,288
HAS	53 (80,3%)	109 (75,7%)	0,46
DM	21 (31,8%)	53 (36,8%)	0,482
FA	25 (37,9%)	22 (15,3%)	<0,001
Dyslipidemia	28 (42,4%)	50 (34,7%)	0,284
Smoking	12 (18,2%)	44 (30,6%)	0,06
Chagas	4 (6,1%)	12 (8,3%)	0,564
Heart disease	26 (39,4%)	31 (21,5%)	0,007
Previous stroke	22 (33,3%)	32 (22,2%)	0,087
Systolic Pressure (mmHg)	158 (\pm 29)	156 (\pm 30)	0,707
NIH admission	16 [5-22]	5 [3-13]	<0,001
NIH high*	3 [1-11]	2 [0-6]	0,028
ASPECTS	-	-	
03-07	12 (19,0%)	17 (12,1%)	0,186
08-10	51 (81,0%)	124 (87,9%)	
Thrombolysis	40 (60,6%)	56 (38,9%)	0,003
Thrombectomy	23 (34,8%)	21 (14,6%)	0,001
Length of stay (days)	9 (\pm 10)	7 (\pm 8)	0,048
Infection	21 (31,8%)	25 (17,5%)	0,02
Rankin 3 months	2 [1-4]	1 [0-3]	0,028
Death	9 (13,6%)	12 (8,3%)	0,234

Table 1. Characteristics of ischemic stroke patients admitted according to how they were referred in the pre-hospital setting.

NIHSS (mean 5 [3-13]), were more likely to go to a PACU first, mainly because they were unfamiliar with the symptoms of a stroke and also because their symptoms were less severe. In addition to this variable, there was also a significant difference between patients with comorbidities such as atrial fibrillation (37.9% vs. 15.3%; $p = <0.001$), with these patients more actively seeking to call the SAMU, as well as patients with heart disease (39.4% vs. 21.5%; $p = 0.007$), showing a possible greater severity of symptoms in patients with heart disease and atrial fibrillation.

In the analysis of dependent variables such as thrombolysis, there was a significant difference between patients coming from direct SAMU or UPAs (60.6% vs. 38.9%; $p = 0.003$) and, along the same lines, mechanical thrombectomy had a significant difference (34.8%

vs. 14.6%; $p = 0.001$). Therefore, there is a greater tendency to carry out treatment (thrombolysis and mechanical thrombectomy) in patients admitted via the SAMU, possibly due to the greater severity of symptoms.

In the analysis of patients' length of stay, there was a significant difference between patients' length of stay ($p = 0.048$) and hospital infection rates were also higher in the direct SAMU group ($p = 0.02$). These higher rates can be explained by the greater severity of the clinical condition presented by the patients who called SAMU.

CONCLUSIONS

The results show that patients admitted via the SAMU are significantly more serious and are associated with higher treatment rates.

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