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# Delay on arrival of the person with cerebral vascular accident to a hospital reference service

**ABSTRACT** | Objectives: To analyze factors that delay the care of patients in the acute phase of stroke in a public referral hospital. Methods: Cross-sectional study, conducted in the city of Salvador / Bahia with 50 patients using data from medical records and semi-structured interviews. The data were analyzed using the SPSS version 21 program, using the Chi-square for the time variables, with a significance level of 5%. Results: There was a mean age of  $61.2 \pm 13$  years, with a predominance of males. Most patients did not undergo thrombolysis due to delay factors such as: using their own car, not having a family member present at the time of the event, arriving at the hospital outside the therapeutic window and looking for other services previously. Conclusion: Several factors delay the care of patients with stroke. Thus, there is a need for improvements in care associated with the dissemination of information to the population.

**Keywords:** Stroke, Emergency Medical Services, Thrombolytic Therapy, Access to Health Services.

**RESUMEN** | Objetivos: Analizar los factores que retrasan la atención de pacientes en fase aguda de ictus en un hospital público de referencia. Métodos: Estudio transversal, realizado en la ciudad de Salvador / Bahía con 50 pacientes utilizando datos de historias clínicas y entrevistas semiestructuradas. Los datos se analizaron mediante el programa SPSS versión 21, utilizando el Chi-cuadrado para las variables de tiempo, con un nivel de significancia del 5%. Resultados: la edad media fue de  $61,2 \pm 13$  años, con predominio del sexo masculino. La mayoría de los pacientes no se sometieron a trombólisis por factores de demora como: utilizar su propio coche, no tener un familiar presente en el momento del evento, llegar al hospital fuera de la ventana terapéutica y buscar otros servicios previamente. Conclusión: varios factores retrasan la atención de los pacientes con ictus. Por tanto, existe la necesidad de mejoras en la atención asociadas a la difusión de información a la población.

**Palabras claves:** Accidente cerebrovascular, servicios médicos de emergencia, terapia trombolítica, acceso a servicios de salud.

**RESUMO** | Objetivos: Analisar fatores que retardam o atendimento dos pacientes na fase aguda do Acidente Vascular Cerebral em um hospital público de referência. Métodos: Estudo de corte transversal, realizado na cidade de Salvador/Bahia com 50 pacientes através de dados em prontuários e por entrevista semiestructurada. Os dados foram analisados através do programa SPSS versão 21, utilizado o Qui-quadrado para as variáveis do tempo, com nível de significância de 5%. Resultados: Evidenciou-se média de idade de  $61,2 \pm 13$  anos, predominando o sexo masculino. A maioria dos pacientes não realizou trombólise devido a fatores de atraso como: utilização de carro próprio, não ter um familiar presente na hora do evento, chegada ao hospital fora da janela terapêutica e procura por outros serviços anteriormente. Conclusão: Diversos fatores retardam o atendimento ao paciente com Acidente Vascular Cerebral. Desta maneira, observa-se a necessidade de melhorias no atendimento associada à difusão de informações à população.

**Palavras-chaves:** Acidente Vascular Cerebral; Serviços Médicos de Emergência; Terapia Trombolítica; Acesso aos Serviços de Saúde.

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## INTRODUCTION

Highlighted as one of the main causes of mortality in the Brazilian population <sup>(1)</sup>, Stroke is the target of one of the priority lines of care of the Urgency and Emergency Care Network (RUE). The concern with the disease is reflected both by its incidence and by its potential to cause neurological damage, influencing the quality

of life of the affected person, his family and caregivers.

According to the Management Report of the Health Care Secretariat of the Ministry of Health, in 2012, 126.805 thousand deaths from stroke were found, which triggered measures to expand the beds of the Unified Health System for these patients. There are currently 57 hospitals qualified for specialized stroke care. <sup>(2)</sup>

In a nationwide study, the Northeast was referred to as the Brazilian region with the most cases of the disease in people aged 30 to 59 years <sup>(3)</sup>, which demonstrates the precocity of the disease and confirms the need to establish processes of evaluation and adherence to health actions, such as measures to

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prevent complications and reduce morbidity and mortality.

The Stroke Care Line, through actions proposed to the components of the RUE, aims to reduce morbidity and mortality, based on strategies for the dissemination of knowledge about the disease; improving the resolution of the basic care network in terms of adequate control of risk factors for vascular diseases; qualification of the Mobile Emergency Care Service (SAMU) for proper care and referral of the patient; accreditation of emergency care services capable of providing general care and thrombolytic therapy; expansion of hospital beds for complex chronic care and rehabilitation; and outpatient rear institution for sequential care after hospital discharge. <sup>(4)</sup>

The consequences for people who develop a stroke are related to access to health services, whose improvement tends to reduce disabilities and death. Current treatments with thrombolytics (medicated) or thrombectomy (surgical) reflect in better results in the patient's functional recovery, but access to the units that perform them must occur in a timely manner. <sup>(5)</sup> However, there are factors that contribute to the delay in accessing the appropriate specialized service, reflecting in worse results in health and quality of life.

Thus, the objective of this study is to analyze the factors that delay the care of patients in the acute phase of stroke in a public reference hospital. The results can contribute to support care protocols, assess the need to train professionals and implement strategies to clarify aspects of the disease to the population that strengthen its identification and allow assistance to be carried out in a timely manner.

## METHODS

This is a cross-sectional study carried out in a stroke reference unit of a public hospital in Bahia, aiming to meet the Clinical Protocol and Therapeutic Guidelines for Thrombolysis in the Ischemic Stroke by SUS, instituted by the Ministry of Health. <sup>(6)</sup>

The sample consisted of 56 patients diagnosed with stroke who were admitted to the Reference Unit (UR). Inclusion criteria were patients with ischemic stroke admitted to the UR with onset of the event less than five days, so that the answers were as reliable as possible. Patients with hemorrhagic stroke were excluded, unable to answer questions and without responsible family members. After applying the inclusion and exclusion criteria, the interviews were applied to 50 patients and/or family members.

Data were collected from April to July 2014. Information was collected from the medical records of the patients' clinic, times of arrival and care at the hospital and the performance of thrombolysis. The questionnaire applied contained: age, sex, date of the event and time when the symptoms were perceived, if the patient was alone at the time of the event, if there was a family member or someone else in the hospital, if the patient lived alone, what was the means of transport used to the hospital, time from the onset of symptoms to the arrival at the specialized service, tomography, if there were difficulties in reaching the hospital and if another service was sought before being referred to the reference hospital.

In order to guarantee the answer to the questionnaire, data collection was carried out through sporadic visits during the afternoon, a period in which the family members would be present, according to the time of visit established by the Unit.

The data were tabulated using the Statistical Package for the Social Sciences (SPSS) version 21 program. In descriptive statistics, the analysis and interpretation

of the data was carried out through the distribution of absolute and relative frequencies. Chi-square test was used for the time elapsed from the event to the specialized unit and sex and time elapsed from the event to the hospital and thrombolysis. The level of significance was 5%.

The research project was submitted to the Ethics Committee of the School of Nursing at the Federal University of Bahia and was approved under opinion number 528.578 and CAAE 25203113.1.0000.5531, meeting the ethical requirements of the research according to Resolution No. 466/2012. <sup>(7)</sup> All subjects confirmed their acceptance of their participation by signing the Free and Informed Consent Form (ICF) before data collection.

## RESULTS

Fifty people diagnosed with stroke admitted to the Reference Unit were interviewed. The mean age was 61.2 ( $\pm$  13 years), with a minimum age of 28 years and a maximum age of 83 years. The characteristics of stroke patients and access to the hospital reference unit are shown in Table 1.

Among other means of transport, patients were transferred by inter-hospital ambulance (2%), by intermunicipal hospital ambulance (4%), by private service ambulance (2%), ambulance linked to the Emergency Care Unit (UPA) (2%). There was also a patient who was already admitted to the hospital to undergo a surgical procedure and on the first postoperative day he had a stroke, being only transferred from the ward to the stroke unit (1%).

**Table 1 - Characteristics of stroke patients and access to the hospital reference unit, Bahia, Brazil, 2014.**

<b>Características dos pacientes com AVC e acesso à unidade de referência hospitalar</b>	<b>n</b>	<b>%</b>
<b>Sexo</b>		
Masculino	29	58
Feminino	21	42

### **Familiar presente no momento do AVC**

Sim	37	74
Não	13	26
<b>Paciente vive sozinho</b>		
Sim	06	12
Não	44	88
<b>Quem acompanhou o paciente</b>		
Familiar	43	86
Sem acompanhante	04	8
Vizinho	03	6
<b>Turnos</b>		
Manhã (01-12:55h)	32	64
Tarde (13-17:55h)	12	24
Noite (18-24:55h)	06	12
<b>Meio de Transporte</b>		
Carro próprio	25	50
SAMU	10	20
Outros	07	14
Táxi	05	10
Ônibus	02	04
Andando	01	02

Fonte: dados da pesquisa.

Tempo	Sexo		P
	Masculino	Feminino	
< 1 hora	0	1	P= 0,076
1-2 horas	0	2	
2-3 horas	5	3	
3-4 horas	2	6	
4-5 horas	3	1	
>5 horas	19	8	
<b>Total</b>	<b>29</b>	<b>21</b>	

Source: research data.

The average time between the onset of symptoms and the arrival at the hospital emergency was 12 hours and 27 minutes, with 22% of patients arriving within the first 3 hours and 16% of patients arriving between 3 and 4 hours after symptom onset, 8% arrived between 4 and 5 am and 54% arrived after 5 am of the ictus.

Regarding the time elapsed from the event to the Specialized Unit and sex,

women arrived at the hospital faster when compared to men, but this difference was not statistically significant ( $p = 0,076$ ) (Table 2), however, the association of patients who used venous thrombolytic agents and sex, demonstrated that women (20%) were the ones who performed this procedure more than men (12%) and this difference was statistically significant ( $p = 0,044$ ).

Of the patients, 40% sought other services before, following five different paths. Six people sought out hospitals that did not have the proper structure for stroke patients; two people sought out Basic Health Units; three people sought hospitals in the metropolitan region (cities close to Salvador); six people sought hospitals in cities in the interior of the State of Bahia, who did not have the resources to serve them; and nine people went to the Emergency Care Units. The patients who sought the Reference Hospital as the first choice were those who arrived at the hospital faster and underwent thrombolytic therapy.

All patients who participated in the research underwent a computed tomography scan of the skull to elucidate the diagnosis, and 32%<sup>(16)</sup> underwent the thrombolysis procedure.

Regarding transportation to the hospital, patients, regardless of gender, behaved similarly, preferably using their own car, followed by SAMU. The association between transport and sex was not statistically significant ( $p= 0,450$ ).

The association between the time elapsed from the stroke to the hospital and the performance of thrombolysis, demonstrated that patients who arrived at the reference hospital up to 4 hours used thrombolysis and this difference was statistically significant ( $p= 0.000$ ) (Table 3).

Only 9 (18%) patients reported difficulties in reaching the hospital. Such obstacles were grouped in difficulties with transportation, including bottled traffic (3), bus delay (1), making intercity transport by own car (1); difficulties with the companion: the fact of being just to get driving (1) or delay in getting in touch with the family (1); geographical barriers such as living in the metropolitan region and "being late" (in relation to the time) to go to the hospital (1); the fact of living in the interior or in the metropolitan region of Salvador (4); bureaucratic and service barriers (1); and having to wait for the availability of the inter-hospital ambulance to perform the transport (1). In

addition to these, obstacles related to the lack of knowledge about the disease were mentioned (1) or the lack of knowledge about the existence of a specialized unit for stroke care (1).

As for the service, the delay was attributed to the delay of the SAMU in regularizing the patient to the hospital, despite the SAMU team arriving quickly (2); delay in making a form at the Reference Hospital (2); one of them reported that the delay was even greater because the reception printer was broken; and that there was a delay in seeing the doctor in the hospital emergency (1).

## DISCUSSION

In the study, there was a predominance of male patients and a mean age of 61,3 years. These data corroborate with other studies carried out in Brazil, such as in Minas Gerais, which indicated that 55% were men and an average age of 64,3 years (8), in Santa Catarina with 51% of men and average age of 66,2 years. (9) In the Netherlands, about half (50,2%) of the patients were men, with a mean age of 69,4 years.<sup>(10)</sup>

The identification of young stroke patients is becoming increasingly common due to the diverse cultural characteristics and lifestyles of the population that reflect an increase in risk factors for the disease, with emphasis on arterial hypertension, smoking, physical inactivity, overweight

and obesity, nutritional imbalance and dyslipidemia.<sup>(11)</sup>

It was evidenced in this study that women with stroke arrived faster than men and were thrombolized in greater numbers. Gender-related issues can be obstacles to the search for health services by men, due to feelings such as fear and shame, but also due to careless behavior and the assignment of other priorities that minimize health concerns.<sup>(12)</sup>

The predominance of the morning period in the identification of stroke cases may be related to the so-called 'Wake-up', which refers to the fact that the patient wakes up with symptoms. A study shows that 25% of stroke patients perceive changes in this period. This characteristic may be related to the severity of the disease and may be directly related to diabetes and the sedentary lifestyle. The 'Wake-up' is still intrinsically related to the loss of therapeutic window due to the difficulty in defining the onset of symptoms.<sup>(13)</sup>

In this study, the average time greater than 12 hours to reach the hospital is much longer than the maximum expected time of 210 minutes to be spent in the pre-hospital, including decision time and travel. This differs from studies in European countries such as Spain in which patients arrive at the emergency room with a median time of 138 minutes<sup>(14)</sup> or in the Netherlands, where the average time between the onset of symptoms and the time of arrival at the emergency room was 240 min.<sup>(10)</sup>

Socioeconomic conditions and access to health services are identified as factors that influence pre-hospital delays. (15,16) Failure to recognize signs and symptoms is another reason for delayed treatment and recognizing them may be a reason for not triggering the pre-hospital service.<sup>(17)</sup>

It was observed that a portion of the patients who sought care at another health service previously, failed to reach the therapeutic window. The complexity of the health system and its bureaucratic routines can limit the dynamics of health care<sup>(18)</sup> and collaborate for barriers to specialized services.

In this study, five types of health units that were involved in the patient's itinerary before arriving at the referral hospital were highlighted. The pre-hospital routes to the hospital are numerous, complex and reflect delays, depending on the entrance door used. According to a study in the Netherlands, patients followed 10 different paths to reach the stroke unit, with only 5% having contact with only one health service before arriving at the hospital.<sup>(10)</sup>

Patients who sought the Reference Hospital as the first choice were those who had arrival times in a more opportune time for thrombolytic therapy. On the other hand, being in cities in the countryside constitutes a delay in arriving at the hospital and ineligibility for thrombolysis.

The lack of knowledge about the symptoms and the need for early stroke care and other difficulties such as transportation and the search for previous medical services delay adequate patient care.<sup>(19)</sup>

Current recommendations point to the organization of integrated stroke care systems, including the activation of pre-hospital health services. This involves the need for other tertiary services against referring patients in a therapeutic window to specialized stroke centers in a timely manner.<sup>(20)</sup>

Regarding the means of transport, the car itself was the most used, followed by SAMU. However, using some transport is a factor in delaying patient care. The

**Table 3: Time elapsed from stroke to hospital and thrombolysis. Salvador. 2014**

Tempo	Realização de Trombólise		p
	Sim (n)	Não(n)	
< 1 hora	0	1	P= 0,000
1-2 horas	2	0	
2-3 horas	5	3	
3-4 horas	8	0	
4-5 horas	1	3	
>5 horas	0	27	
Total	16	34	

Source: research data.

private car was associated with a greater number of patients with delay in attendance and the service and transport by SAMU associated with the arrival at the specialized unit with a time interval of less than 5 hours.

Only one patient who used an ambulance other than SAMU, underwent thrombolysis, after the stroke was identified in another hospital and referred to the specialized unit. The patient's access to Stroke Reference Units, when early, is related to better recovery and reduction of serious sequelae. <sup>(21)</sup>

As in the present study, in a survey conducted in Argentina, it was pointed out that seven out of ten people attended did not use the pre-hospital service, going to the emergency room in their own transport or in rented vehicles. It was noticed that physical difficulties to use their own transport made patients activate the pre-hospital service, but there was no benefit of time for those who used this service. <sup>(17)</sup>

In Spain, on the other hand, the use of the pre-hospital service improved the service time with an average view of only 15 minutes in patient care, before moving to the hospital. <sup>(14)</sup> In Rhône, France, that time interval was 14 minutes. <sup>(22)</sup> In the present study, factors such as long waiting for medical regulations to allow travel to the Reference Hospital may mean delay in pre-hospital care.

Notification of the hospital by the prehospital service before the patient's arrival was associated with a better average time of image and needle holder. Not notifying, however, does not shorten hospital times against a stroke code. <sup>(23)</sup>

For patients living alone, no delay was observed in the time of arrival at the specialized service. Even living alone, the vast majority of people who accompanied stroke victims were family members, which demonstrates the importance of the family's support network and its influence on family cohesion and adaptability. <sup>(24)</sup>

It is important to note that although the percentage of thrombolized patients

in this study is 32%, this percentage does not mean the relationship between patients who sought health care and were thrombolized. The patients included in the study were already admitted to the stroke unit. In the Netherlands, in the entire stroke population, thrombolytic treatment can be administered only to a minority between 1 and 8% (10) and in Argentina the city's average thrombolysis is 1%. <sup>(17)</sup>

The performance of the computed tomography exam for all patients in the study may be associated with the fact that



In the hospital environment, in turn, some patients and family members reported delay in making the attendance form in the hospital emergency and delay in going through the emergency neurologist.



this exam is a requirement for neurological evaluation and admission to the specialized unit.

Only 9 patients reported difficulties in reaching the referral hospital, even though only a few had been thrombolized. This involves not identifying the risks, the severity of the disease and not knowing about the time required for timely treatment. There is a need to strengthen community education about the disease, especially for patients with risk factors, with the dissemination of emergency service activation systems; organization of health services; and information on performing thrombolytic therapy up to 4,5h. <sup>(20)</sup>

There are contextual, cognitive and behavioral factors that reduce the pre-hospital delay time and the time until treatment such as asking for help immediately after the onset of symptoms, presenting symptoms during the day or at the weekend, presenting symptoms outside the home, realizing that you cannot control your symptoms without assistance, recognizing and interpreting stroke as a medical emergency, calling pre-hospital care as the first medical care, having difficulty speaking because it is a more alarming symptom. <sup>(14)</sup>

In the hospital environment, in turn, some patients and family members reported delay in making the attendance form in the hospital emergency and delay in going through the emergency neurologist. Patients evaluated by a multidisciplinary team on the immediate arrival of the ambulance to the Emergency and a quick referral to a CT scan increase the percentage of patients undergoing thrombolysis. <sup>(25)</sup> Thus, future studies that investigate hospital effectiveness are important.

#### CONCLUSION

Several factors delay the care of patients in the acute phase of stroke in a public referral hospital, although patients and family members have limited identification of these factors. This fact can be attributed to the lack of awareness about

the consequences of the disease and to highlight the importance of health education directed to the population in order for them to identify, activate the Mobile Emergency Service or refer this patient quickly, and secure to the Reference Unit.

The delay factors, linked to the institutions, and not only to the patient's deci-

sion, must be observed and minimized so that corrections are made and more patients are submitted to the recommended treatment. Assistance protocols, awareness raising and continuing education of professionals and development of strategies in the service should allow assistance to be carried out in a timely manner.

Thus, the RUE must be structured according to the Stroke Care Line to allow regulation in emergency situations to occur more effectively, which includes the ability to respond to the needs of less complex institutions, in addition to training professionals in recognizing the manifestations of the disease. 🐼

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