

# Characterization of stroke with a focus on oral communication disorders in inpatients of a regional hospital

## Caracterização de acidente vascular cerebral com enfoque em distúrbios da comunicação oral em pacientes de um hospital regional

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### ABSTRACT

**Purpose:** To characterize patients with stroke and to establish the prevalence of oral communication disorders (CD) related by cerebrovascular accident (CVA) and the frequency of indication or request of speech therapy. **Methods:** A retrospective cross-sectional study from the medical report forms of 95 patients hospitalized for stroke between June 2007 and June 2008 in a regional public hospital. **Results:** Out of the 95 patients, 51 (53.7%) were male (mean age was 59.8 years old), 48 (59.3%) had a history of hypertension, 82 (86.3%) had ischaemic stroke and CD were present in 53 (55.8%) of patients. The mean hospital stay was 5 days. There was no significant relationship between the type of stroke and CD, or between the site of neurological damage due to stroke and the occurrence of CD. None of the subjects received an evaluation or speech-language therapy during hospitalization, and there were no referrals to healthcare after discharge. **Conclusion:** More than 50% of individuals affected by stroke had oral communication disorders during the hospitalization. There was no any indication or request for speech therapy in this period, even after discharge. These findings indicate a probable failure to integrate with the speech therapy staff for the treatment of patients with neurological diseases. It is necessary to further evaluate whether this is due absence of speech therapists in the team or just healthcare professionals lacking knowledge about the possibilities of speech therapy along with disturbances in oral communication due to stroke.

**Keywords:** Stroke; Communication disorders; Language disorders; Speech, Language and Hearing Sciences; Epidemiology

### RESUMO

**Objetivo:** Caracterizar pacientes com acidente vascular cerebral (AVC), verificar a prevalência de distúrbios de comunicação oral relacionados e a frequência de encaminhamento para reabilitação fonoaudiológica. **Métodos:** Estudo retrospectivo dos prontuários de 95 pacientes internados por AVC, entre junho de 2007 e junho de 2008, em hospital público da região metropolitana de Porto Alegre. **Resultados:** Dos 95 pacientes, 51 (53,7%) eram do sexo masculino, com média de idade de 59,8 anos; 48 (59,3%) apresentavam histórico de hipertensão arterial; 82 (86,3%) apresentaram AVC tipo isquêmico e 53 (55,8%), distúrbios de comunicação oral. O tempo médio de internação foi de cinco dias. Não houve relação significativa entre o tipo de AVC e distúrbio de comunicação oral, tampouco entre o local da lesão neurológica decorrente do AVC e a ocorrência de distúrbio de comunicação oral. Nenhum dos sujeitos recebeu indicação de avaliação ou tratamento fonoaudiológico durante a internação ou na alta. **Conclusão:** Mais de 50% dos indivíduos acometidos por AVC apresentam distúrbios de comunicação oral durante o período de internação hospitalar. Não houve nenhuma indicação ou solicitação de atendimento fonoaudiológico neste período, tampouco em encaminhamento para atendimento após a alta hospitalar. Estes achados indicam provável falha da inserção fonoaudiológica em equipes que atendem pacientes acometidos por doenças neurológicas, sendo necessário avaliar mais profundamente se isto ocorre devido à ausência do fonoaudiólogo na equipe, ou ao pouco conhecimento dos profissionais sobre a atuação fonoaudiológica junto aos distúrbios de comunicação oral decorrentes de AVC.

**Descritores:** Acidente vascular cerebral; Transtornos da comunicação; Transtornos da linguagem; Fonoaudiologia; Epidemiologia

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## INTRODUCTION

Stroke is one of the main public health issues nowadays. It is one of the most prevalent neurological disorders and also one of the main causes of temporary or definite disability. In Brazil, 68,000 stroke-related deaths<sup>(1)</sup> are reported every year.

Up to 70% of the stroke patients who are discharged from hospital struggle with issues related to oral communication and residual functional disability, which impacts their independence regarding activities of daily living<sup>(2,3)</sup>. The loss of oral communication in stroke results from aphasia and dysarthria<sup>(4)</sup>, loss of communication capabilities that may create social isolation and subsequent depressive conditions<sup>(5)</sup>.

Some studies indicate the relevance of early intervention in order to prevent and/or rehabilitate communication after the stroke. The prognosis seems to be better the earlier those strategies are initiated<sup>(6,7,8,9,10,11,12,13,14)</sup>, even though controlled studies are rare.

In Brazil, the presence of speech therapists in the stroke units was only recommended for management support after the creation of an stroke hotline (Linha do Cuidado do AVC)<sup>(1)</sup>. Nevertheless, it is still difficult to estimate the number of referrals to speech therapy treatment follow-up after hospital discharge.

This study aimed at characterizing the stroke patients, as well as to assess the prevalence of oral communication and how often stroke patients are referred to speech therapy rehabilitation among those who were seen at a medium-sized reference regional hospital part of SUS (Brazilian Health System) in the southern region of Brazil, until their hospital discharge.

## METHODS

Observational descriptive study, conducted by gathering data from the medical report forms from all stroke patients between June 2007 and June 2008 admitted to a reference municipal public hospital located in the Vale dos Sinos (RS) region – comprised of 20 cities of greater Porto Alegre (RS) – and that serves a population of approximately two million people.

The eligibility criteria were adult patients, both male and female, with 25 years old or older and whose hospital stay is due to acute stroke, with no history of other neurological diseases. The search was carried out by going through the hospital admission authorization lists and identifying the medical report form of stroke patients by codes I.60 through I.69<sup>(15)</sup> of International Classification of Diseases, 10 Revision (ICD-10) during the study period. Out of the 134 eligible cases, 95 cases whose medical report forms were located and provided by the hospital staff were assessed. The exclusion criteria were patients admitted for other non-stroke conditions; patients admitted for stroke, but whose medical report forms were not found, preventing collection of data; and patients who died during their hospital stay.

The assessed variables were:

- Age as in-patient, sex, education, professional occupation and previous chronic disease.
- Type of Stroke (ischaemic and hemorrhagic).
- Location of stroke – (I) left hemisphere, (II) right hemisphere, (III) right and left hemispheres and (IV) indefinite.
- Presence of oral communication disorder; considered as present when the medical report form lists aspects related to difficulties in speech and understanding or verbal/oral communication after the first medical assessment.
- Referral for assessment and/or rehabilitation, confirmed by the medical report form, between patient admission to the hospital due to stroke until their discharge.

The data was added to an Excel database and run through software SPSS version 21.0. The variable frequencies and their 95% confidence intervals were tabulated. The statistical significance was  $p \leq 0.05$ . For a 50% estimate prevalence in oral communication disorders, the study power was 70%.

The study was approved by *Universidade Feevale's* Research Ethics Committee, registered under protocol number 4.07.03.08.996. The research was authorized by the technical director of the abovementioned hospital and the authors signed an Agreement for the Use of Secondary Data, as established in Resolution 466/12 by CNS (*Conselho Nacional de Saúde*).

## RESULTS

Out of the 134 patients diagnosed with stroke admitted at the hospital between June 2007 and June 2008, 39 (29.1%) died during hospital stay or did not have their medical report forms located, making the data collection for this study impossible. Out of the 95 studied patients, 51 (53.7%) were male, with average age of 59.8 years old (SD=13.9) and living in the micro-region where the study hospital is located; most of the patients (91.5%) live in the city of Novo Hamburgo (RS), where the hospital is located. It is worth mentioning the low level of education, with an average of 4.7 (SD=3.16; median=5) years of education (Table 1).

**Table 1.** Distribution of social and demographic characteristics in the studied population

Variáveis		n (%)
Sex	Female	44 (46.3)
	Male	51 (53.7)
City of residence	Novo Hamburgo	86 (91.5)
	Other	9 (8.5)
		<b>Average (SD)</b>
Age		59.8 (13.9)
Education (in years)		4.7 (3.1)

The occupational areas the studied patients were inserted in were widely diversified, including services and industry areas.

When it comes to the presence of chronic diseases, 65

(68.4%) of the patients were diagnosed with one of them, being systemic hypertension the most prevalent (Table 2).

**Table 2.** Distribution of chronic diseases in the studied population

Chronic diseases diagnosed	Absolute frequency (n)	Relative frequency (%)
Hypertension	48	73.8
Diabetes	1	1.5
Hypertension and heart conditions	1	1.5
Hypertension and diabetes	9	13.8
Hypertension and dyslipidemia	2	3.1
Hypertension, diabetes and heart conditions	1	1.5
Hypertension, dyslipidemia and others	1	1.5
Other	2	3.1

In total, 53 (55.7%) cases presented some kind of oral communication disorder. Among those patients, 86.7% had suffered ischaemic stroke and 69.8% of them were previously diagnosed with at least one chronic condition. The site of lesion was identified through an imaging scan in approximately 70% of the cases (Table 3).

The hospital stay was short; 75% of the patients were admitted as in-patients for an average of 5 days (SD=4).

Data did not indicate speech therapy service during hospital stay or prescription of this kind of treatment upon hospital discharge. Regarding the tested associations (diagnosis of chronic diseases, type of stroke, lesion site and length of inpatient stay vs. oral communication disorder), none was significant.

## DISCUSSION

The objective of this study was to characterize stroke patients by observing the prevalence of communication disorders and subsequent speech therapy rehabilitation follow-up, which failed to reveal significant differences of stroke between sexes; it also confirms the findings in recent studies<sup>(16,17)</sup>, especially those with detailed description of the studied population and that originated from services with similar characteristics<sup>(16,17)</sup>, even though other studies have shown a predominance of male<sup>(18)</sup> or female<sup>(19)</sup> patients. The stroke most commonly affects adult population, especially from their sixth decade of life onwards, which was proven by some studies<sup>(17)</sup> and contradicted by others<sup>(20,21)</sup>. This research stands out due to the percentage of patients under their 50's who had stroke (Table 3). The ratio of strokes in young adults varies from one country to the other, between 5% to 20% of incidence, according to geographical location<sup>(22)</sup>. While diabetes mellitus and coronary diseases are modifiable risk factors for stroke in the elderly, smoking<sup>(11)</sup> and dyslipidemia stand out as the main causes for young patients. Hypertension, on the other hand, is representatively correlated to stroke in different age groups<sup>(22)</sup>.

High blood pressure was the most commonly found chronic disease occurring alone in the research patients (Table 2), which proves the importance of actions aimed at preventing that specific risk factor, since it is associated to several comorbidities<sup>(17)</sup>. However, in studies with multivariate analysis models, diabetes mellitus was mostly associated to aphasia in the surviving patients<sup>(23)</sup>, possibly because the disease course is longer than those in cardiovascular diseases.

One of the limitations in this study was the absence of data on smoking, use of oral contraceptives or performance

**Table 3.** Characteristics of the communication disorders in the studied population

Communication disorder	Yes n (%)	No n (%)	PR (95% CI)
Presence of chronic diseases			
No	16 (16.8)	14 (14.7)	1
Yes	37 (38.9)	28 (29.5)	0.94 (0.63 - 1.392)
Type of stroke			
Hemorrhagic	7 (7.4)	6 (6.3)	1
Ischaemic	46 (48.4)	36 (37.9)	0.95 (0.50 - 1.80)
Location of lesion			
No identification	16 (16.8)	12 (12.6)	1
Right hemisphere	15 (15.8)	12 (12.6)	1.02 (0.64 - 1.63)
Left hemisphere	19 (20)	13 (13.7)	0.97 (0.62 - 1.48)
Right and left hemispheres	3 (3.2)	5 (5.3)	1.52 (0.59 - 3.94)
Age group			
39 years old or younger	6 (6.3)	1 (1.1)	1
40-49 years old	9 (9.5)	8 (8.4)	1.62 (0.94 - 2.80)
50-59 years old	9 (9.5)	11 (11.6)	1.11 (0.63 - 1.94)
60-69 years old	10 (10.5)	16 (16.8)	1.51 (0.95 - 2.40)
>69 years old	19 (20)	6 (6.3)	1.12 (0.77 - 1.64)

**Subtitle:** PR = prevalence ratio; CI = confidence interval

of physical activities, which are synergic and common risk factors for stroke in young adults<sup>(22)</sup>. However, it is a fact that the habit of smoking is prevalent in the population of Rio Grande do Sul, as shown by the incidence of lung cancer in that State<sup>(24)</sup>. Therefore, a deeper investigation of those factors and other etiologies that form the differential diagnosis might have collaborated to better explain the ratio of young adults with stroke found in this sample.

Among the patients participating in this study, most had suffered the ischemic type of stroke, and a smaller number suffered the hemorrhagic type (Table 3); that demonstrates a significant difference regarding prevalence of stroke types and confirms other studies' results<sup>(18,20,21,25)</sup>.

The average length of hospital stay among the studied patients was five days, less than the average found in other studies<sup>(25)</sup>. It is possible that keeping patients with complex clinical characteristics – commonly associated to life support healthcare – in the hospital for so such a short period of time may prevent a detailed assessment of aspects such as communication, which is so relevant to maintain and/or recover autonomy and to maintain relationship of patients to their pairs, in addition to being strongly demanded for laboral activities nowadays<sup>(26)</sup>. That high patient turnover, due to the small length of hospital stay, probably pushes aspects such as communication to background, making identification and treatment less common. On the other hand, the short hospital stay collaborates to decrease the amount of potential complications due to extended inpatient stay, and also decreases financial impact on the health system<sup>(19)</sup>. The occurrence of communication disorders related to the hospital stay is proven by other studies<sup>(25)</sup>.

The oral communication disorders were found in over half of the research patients. Additionally, there is a considerable number of people who had suffered stroke and was facing communication challenges during the hospital stay (Table 3). Such data complies with what is described in the area's literature<sup>(27)</sup>, even though the incidence of oral communication disorders among the surviving patients is between 17% and 36% in the first 30 days after the stroke<sup>(8,23)</sup>, and up being 41% after one year<sup>(9)</sup>. These aspects are possibly related to populational characteristics and the health services they are linked to; those services would derive benefits from regional studies to establish the most appropriate planning that would meet the demand<sup>(23)</sup>.

It was not possible to establish a relationship between the type of stroke and the presence of communication disorders in this research, even though other studies have established association between ischaemic stroke and communication disorders<sup>(25)</sup>.

No significant association was found between the lesion site and the presence of communication disorders. However, studies on this subject have demonstrated that the communication changes in the dominant hemisphere are comprised of difficulties in articulation, oral praxis and language<sup>(17,25)</sup>. In the non-dominant hemisphere lesions, the articulation and

discursive, pragmatic-inferential and lexicosemantics and prosodic abilities are mostly affected<sup>(28)</sup>.

The oral communication disorders are associated to residual difficulties in communication and require rehabilitation service<sup>(8,11,17,20)</sup>. When you consider that the patients who had mild or moderate stroke may not have been admitted to a hospital, but still present some sort of oral communication disorder, the incidence of those sequelae may be higher and, therefore, the demand for rehabilitation would also be higher<sup>(25)</sup>.

Since that there is evidence that the early rehabilitation is the most effective treatment and is related to a shorter length of hospital stay – even though other facts, such as previous stroke comorbidities, previous stroke history and type, location and severity of the lesion should be taken into consideration<sup>(8)</sup> –, the implementation and continuity of speech therapy care would be expected. However, none of the researched individuals was given speech therapy during their hospital stay, and no records of referral to speech therapy after hospital discharge were found, which is completely the opposite to the intervention guidelines for the stroke sequelae, both during the hospital stay and during follow-up of patients with sequelae<sup>(6)</sup>. These findings demonstrate that the stroke patient, at its best, will only receive full rehabilitation service if referred to follow-up after hospital discharge by a basic healthcare team, since no records were found of complementary treatments for rehabilitation of sequelae during the hospital stay, or even in the reports right before the hospital discharge, as widely recommended by the area's literature<sup>(26,28)</sup>. The contribution of speech therapy to stroke patients aims at widening their prognosis, such as shorter length of in-patient stay and decrease in re-admission rate due to nutritional complications, as well as the recovery of social interaction activities by means of communication, collaborating significantly to the improvement of patients' quality of life<sup>(14,17,28,29)</sup>.

The findings referring to the absence of speech therapist in that specific hospital refer to the fact that, in some Brazilian regions, there are no multidisciplinary teams to care for stroke patients, whether during hospital stay or after hospital discharge, especially at the prevention of comorbidities, as indicated by several studies on the subject<sup>(9,25)</sup>. Additionally, it is worth mentioning that, even though part of the patients recovers their communication skills spontaneously, an expressive part requires specialized assessment and treatment, which are proven effective for communication rehabilitation<sup>(17,28)</sup>.

Speech therapy in early stages at hospital setting provides significant gains to stroke patient, because it collaborates to the recovery of linguistic and nutritional abilities and to decreased hospital stay, reducing costs, promoting the retake of functional, motor and communication independence and improving the quality of life of the patient and their family.

Even though the guideline is to record all facts and behaviors proposed to the patient, it is possible that some referrals for rehabilitation services are prescribed in prescription books

only and are not added to medical report forms or to hospital discharge reports. The lack of a communication disorders characterization scale may have also be a cause of underdiagnosis, especially in milder cases of oral communication disorders. Both these facts may characterize as potential measurement bias and, therefore, limitation on findings.

The bibliographic references related to oral communication disorders in stroke patients are restricted and epidemiological data is limited. The epidemiologic and descriptive studies in the neuropsychology area developed in Brazil are rare, which leads specialists in that area to look for references and studies carried out abroad<sup>(19)</sup>. The amount of published articles on motor rehabilitation in the main databases exceeds in almost ten times those on speech therapy rehabilitation. The contrast may be explained by how new some healthcare professions are and – especially in underdeveloped nations – reflects the demographic transition and foresees major incidences of stroke for the next years<sup>(30)</sup>, small investments in functional rehabilitation services and the low number of speech therapists in hospitals and in all healthcare facilities, as demonstrated in this research.

Finally, our characterization findings about stroke patients, as well as prevalence of oral communication disorders in those patients, are in agreement with the relevant literature. However, we would like to have found increased referral percentages for speech therapy rehabilitation, taking into account that the oral communication disorders were found in over 50% of the sample. The absence of those professionals in the hospital team is an indicative to understand the results. However, the data was collected before implementing the stroke healthcare hotline and the guidelines on the presence of speech therapists as part of the healthcare multidisciplinary teams. Therefore, it is probable that the frequency of referrals in the real world needs reformulation.

## CONCLUSION

Over 50% of stroke patients had oral communication disorders during their hospital stay. There was no indication or request for speech therapy support during that time, neither referral to treatment after hospital discharge. Those findings indicate a probable failure to add speech therapy in staff dealing with patients with neurological diseases, but it is necessary to make a deeper investigation whether it occurs due to absence of a speech therapist in the team or due to lack of knowledge by the healthcare professionals about the need to refer the patient to speech therapy when it comes to oral communication disorders due to stroke.

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