

ASSESSMENT OF LANGUAGE AFTER STROKE IN ADULTS IN THE STATE OF SERGIPE

Avaliação da linguagem após acidente vascular cerebral em adultos no estado de sergipe

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ABSTRACT

Purpose: to study the occurrence of language disorders in subjects who had suffered stroke from February to August 2012, under treatment at the center for education and health of Sergipe State, in the section of physiotherapy referral. The language evaluation was based on the Test of Rio de Janeiro (2005). **Methods:** data analysis was performed using descriptive statistics and probability through frequency distribution, calculation of mean, standard deviation and percentiles, Mann-Whitney U Test and Chi-Square. **Results:** the sample was composed of 31 subjects, of both genders, aged in between 30 and 94 years. The data also showed that gender, education and age, influence test performance, verifying that the male subjects below 65 years and those with schooling above incomplete primary school level have higher scores. **Conclusion:** the data show that a higher percentage of the sample has comprehension disorders, when compared to language expression disorders.

KEYWORDS: Stroke; Aphasia; Language Disorders; Language Tests

■ INTRODUCTION

Communication is possibly the most important among the processes that develop in between people, since its development regards cognitive functions. This process represents interpersonal relationships, in which the participants will interpret their own communicative actions, as well as others' and this will provide direction for social relationships¹. However, in order for communication to happen functionally, the brain mechanisms responsible for language must be intact.

The advancement in health sciences influences a higher life expectancy and, for this reason, contributes to the increase in the number of elderly people², a fact that is observed nearly everywhere around the world³. According to demographic data,

the prediction is that, in 2020 the number of elderly citizens in Brazil will have reached 34 million, and, thus, the country will have the sixth oldest population in the world⁴. The older segment of the population presents a higher predisposition towards the occurrence of circulatory and degenerative problems that frequently cause brain damage³. Brain damage means any neurological lesion such as, for example, Cerebral Vascular Accident (CVA) or stroke, Cranioencephalic Traumatism, Tumors and progressive encephalopathies such as Parkinson's and Alzheimer's disease⁵.

Strokes are the greatest cause of incapacity among adults⁶. According to data from the Brazilian Cardiology Society, the stroke is one of the most common neurological disorders during aging, and may be understood as a transitory or permanent neurological deficiency that is secondary to a vascular lesion in any area of the brain⁷. The following are mentioned as post-stroke manifestations: motor deficits, functional incapacity, language disorders, dysphagia (swallowing difficulties), depression, difficulties in social adjustment and worsening in quality of life. Researchers report that language disorders are the main sequelae that generate functional incapacities⁸. Studies show that strokes are the main

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cause of aphasia in current times⁵, which may be identified in over 20% of patients, reaching up to 40% during the acute phase⁹.

Researchers state that aphasia leads to linguistic disorders that harm the understanding and expression of verbal and/or written symbols, which limits both oral and written communication^{4,7,9,10}.

Among the many existing classifications for aphasia, the one from Boston is the most widely known¹¹ where Broca's and Wernick's aphasias are the best known, and may be understood as: Broca's aphasia, an expression aphasia characterized by a lesion in the frontal left cortex, where comprehension is more preserved and where there are difficulties in expressing thoughts using verbal or written language; Wernick's or reception aphasia, resulting from a lesion in the posterior temporal cortex, characterized by harm in language comprehension that may vary from slightly impaired to absent. In this type of aphasia, speech is fluent, however with no meaning in several occasions¹².

In this study, the terms comprehension and expression aphasia will be adopted and described as "reception or comprehension aphasia, Wernick's, sensorial or fluent aphasia, as the one that presents a difficulty in "understanding the symbol of words" and "expression or motor aphasia, Broca's or disfluent aphasia" which results in the "difficulty in organizing the conventional rules of the language"¹³.

There are several foreign tests for aphasia assessment¹⁴. For example, there are: the *Mississippi Aphasia Screening Test (MAST)*¹⁵, *The Minnesota Test for Differential Diagnostic of Aphasia*, *Neurosensory Center Comprehensive Examination Profile*, *Functional Communication Profile* and the *Boston Diagnostic Aphasia Examination*¹⁶, in addition to the *Protocol Montreal-Toulouse*¹⁷. Among all of these, the *Boston Diagnostic Aphasia Examination (BDAE)*, introduced by Goodglass and Kaplan in 1973^{14,18,19} stands out.

Studies show that using tests from other countries may interfere in data interpretation, which would make data analysis more difficult due to linguistic, demographic and cultural differences^{16,20}. It has been stated that the BDAE would be sensitive to demographic variables, particularly to information regarding years of schooling¹⁷. Data show that 27% of Brazilians in between 15 and 64 years of age were classified as illiterate in 2009, while another 14% are functionally illiterate, which says that 41% of the population cannot read or understand what is being read^{21,22}.

The Rio de Janeiro Test or the Aphasia Rehabilitation Test, used in the present study was developed focusing on the Portuguese Language spoken in Brazil¹². The aim of this instrument is to

analyze the language of aphasic subjects in order to guide the professionals who work in the field of aphasia in their task of restructuring language.

The interest in conducting the present research was based on the exposed above and the aim of this study is to discover the occurrence of language disorders in individuals who have suffered a stroke and are under care at the Ninota Garcia Health and Education Center.

METHODS

The research Project was sent to the Research Ethics Committee at the Tiradentes University and was approved October 31st 2011, under number 061011.

This is a quantitative, descriptive study, conducted through field study using a validated questionnaire that was adapted to the regional specificities of the studied population that comprises all patients who have suffered a stroke, undergoing assistance at the Ninota Garcia Health and Education Center in between the months of February and August 2012. Subjects with any form of dementia and/or neurodegenerative disorder, or those who had a history of language disorder prior to the stroke were not included in the study.

The subjects were selected after an analysis of medical records, in order to identify those who had suffered a stroke, since the Ninota Garcia Health and Education Center provides care for all neurological conditions.

The Rio de Janeiro Rehabilitation Test¹³, developed considering Brazilian specificities was chosen for language assessment, and is composed of the following tests: Comprehension/Expression of Oral Language (colloquial language, automatic language and associative language), Oral Language Comprehension (word comprehension, comprehension of simple sentences, comprehension of complex sentences, interpretation of spatial concepts), Comprehension/Retention/Memory (choice preposition/oral, comprehension options category/spatial, story comprehension), Reasoning (comprehension of absurd situations, comprehension of orders), Oral Language Expression (antonyms, image denomination, action denomination, naming body parts, naming numbers), Summoning (classes/categories), Linguistic Transpositions (repetition of simple and complex words, repetitions of simple and complex sentences), Reading (letters, syllables, labels, words, sentences, numbers), Spelling (audiovisual, audiographic, audio-visual-motor capacity of metaphoric organization), Dictation (letters, words, sentences), Comprehension of Written Language (identification of letters, words,

understanding: phrases/concept/spatial, numbers, written questionnaire, of a text that was read, of a written order), Expression of Written Language (signature, numbering, alphabet, completing sentences, naming of writing, summoning of writing) and Written Language Organization (organization of written syntax, creation of written sentences).

The test score considers correct answers, incorrect answers, self-correction, absence of answer and test conductor's help. The marking of the results is based on proportions and, in data analysis this test sets out to, among other issues, determine which linguistic residues are functional, or, which area of language should be prioritized at the beginning of the rehabilitation process. In the present study, scoring was conducted following the pattern proposed by the Rio de Janeiro test, where three points are awarded to each correct answer, two points for self-correction, one and a half point for an answer with the help of the test conductor, half a point for incorrect answers and zero for absence of answer.

The test mentioned above could not be used in its entirety as, due to the study being conducted in a non-profit school clinic, aimed towards providing care for the underprivileged population from the Northeast of Brazil, a high proportion of functional illiterate subjects was expected, which would introduce a bias to the study. Thus, an option was made to not consider the following items that require reading and/or writing: Oral Language Organization, Reading, Copy, Spelling, Dictation, Written Language Expression, Comprehension/Reasoning/Written Language and Written Language Organization.

The changes to the instrument were followed by proportional changes to the respective scores, and the excluded items were not counted in the total sum of the test.

The total sum of the scores obtained in the tests of Oral Language Comprehension/Expression, Oral Language Comprehension, Comprehension/Retention Memory, Reasoning, Oral Language Expression, Summoning and Linguistic Transpositions were considered in data analysis, and the results from the different items of each test were not taken into account.

In order to obtain a better distribution of the results, the aforementioned tests were divided into two categories: comprehension (Oral Language Comprehension/Expression, Oral Language Comprehension, Comprehension/Retention Memory and Reasoning) and Expression (Reasoning, Oral

Language Expression, Summoning and Linguistic Transpositions).

Data analysis was conducted using descriptive and probability statistics. The descriptive analysis was made using frequency distribution, calculation of the mean, standard deviation and percentiles. Probability statistics aided the analysis using Mann-Whitney's u test, considering 0.10% as the level of significance.

Percentile calculations were made considering the sum of all comprehension tests (SCOMPT) and the sum of all expression tests (SET). Three cut-off points corresponding to the percentile values were considered in order to classify the predominance of comprehension or expression aphasia. For the sum of the comprehension tests, the cut-offs were set at 10%, 40% and 90% of the sample.

In the present study, it was considered that whoever reached 98% or more of the score does not have comprehension aphasia, whoever obtained in between 80% and 97% of the score has a mild comprehension aphasia, the ones who achieved in between 74% and 79% have a moderate comprehension aphasia and the subjects scoring 73% or under have a severe comprehension aphasia.

The same procedure was adopted for the sum of the expression tests, where the following cut-offs were considered: 10%, 30% and 60%. When comparing the participants with these cut-offs, it was determined that the ones who reached a score equal to or above 98% do not have an expression aphasia, whoever scored in between 97% and 88% have a mild expression aphasia, the ones who obtained points in between 87 and 46% have a moderate expression aphasia, and the ones who scored 45% or below have a severe expression aphasia.

■ RESULTS

The analysis of the medical records began with 11 subjects who had suffered a stroke. At the end there were 31 subjects submitted to evaluation. Of the 31 assessed individuals, 22 participants or 71% reported having at least one risk factor associated to stroke in comparison to the other, or, 29% who did not report this occurrence (Table 1).

Among the researched subjects, 17 were men (53.8%) and 14 were women (42.5%) with ages varying in between 30 and 94. There were 16 subjects (51.6%) who were 65 years old or younger, while 15 (48.4%) were over 65 years of age (Table 2).

Table 1 - Distribution of the frequency of risk factors by gender(ARACJU-SE, 2012)

| RISK FACTOR | MEN | | WOMEN | | TOTAL | |
|-------------|-----|------|--------|------|-------|------|
| | N | % | Número | % | N | % |
| YES | 13 | 59.1 | 09 | 40.9 | 22 | 71.0 |
| NO | 04 | 44.4 | 05 | 55.7 | 09 | 29.0 |

N= Number of assessed patients

% = Frequency of assessed patients

Table 2 - Distribution of the frequency of the sociodemographic profile of the individuals who had suffered a stroke (ARACJU-SE, 2012)

| ANALYZED VARIABLE | N | % | |
|-------------------|----------------|----|------|
| GENDER | Male | 17 | 58.4 |
| | Female | 14 | 45.2 |
| AGE GROUP | Up to 65 years | 16 | 51.6 |
| | Over 65 years | 15 | 48.4 |

N= Number of assessed patients

% = Frequency of assessed patients

In regards to years of schooling, 18 subjects (58.1%) had a schooling equivalent to not having completed their primary education or less, and 13 (41.9%) had more than incomplete primary education (Table 3). When comparing age and

schooling, it was seen that younger people have more years of schooling (Table 3). The individuals with schooling above incomplete primary education had a better performance in most of the evaluated tests (Table 4).

Table 3 – Distribution of the frequency of gender and age group according to level of schooling (ARACJU-SE, 2012)

| SCHOOLING | GENDER | | | | | | AGE GROUP | | | | | |
|------------------------------------|--------|------|-------|------|-------|------|------------------|------|---------------|------|-------|------|
| | Men | | Women | | TOTAL | | 65 years or less | | Over 65 years | | TOTAL | |
| | N | % | N | % | N | % | N | % | N | % | N | % |
| UP TO INCOMPLETE PRIMARY EDUCATION | 10 | 55.6 | 08 | 44.4 | 18 | 58.1 | 07 | 38.9 | 11 | 65.1 | 18 | 58.1 |
| OVER INCOMPLETE PRIMARY EDUCATION | 07 | 53.8 | 06 | 46.2 | 13 | 41.9 | 09 | 69.2 | 04 | 30.8 | 13 | 41.9 |

N= Number of assessed patients

% = Frequency of assessed patients

Table 4 – Distribution of the test means according to level of schooling (ARACJU-SE, 2012)

| TEST | SCHOOLING | N | MEAN | SD | MANN- WHITNEY | |
|--|---------------------------------------|----|-------|------|---------------|-------|
| | | | | | U | P |
| COMPREHENSION/ ORAL LANGUAGE EXPRESSION | Above incomplete Primary Education | 18 | 39.4 | 7.9 | 55.5 | 0.011 |
| | Up to incomplete Primary Education | 13 | 42.5 | 6.9 | | |
| COMPREHENSION/ RETENTION MEMORY | Above incomplete Primary Education | 18 | 47.9 | 5.7 | 59.0 | 0.020 |
| | Up to incomplete Primary Education | 13 | 53.5 | 5.5 | | |
| REASONING | Above incomplete Primary Education | 18 | 19.2 | 6.5 | 52.0 | 0.009 |
| | Up to incomplete Primary Education | 13 | 25.0 | 5.4 | | |
| SUMMONING | Above incomplete Primary Education | 18 | 20.2 | 8.6 | 60.5 | 0.011 |
| | Up to incomplete Primary Education | 13 | 26.7 | 2.6 | | |
| LINGUISTIC TRANSPOSITIONS | Above incomplete Primary Education | 18 | 40.3 | 13.7 | 65.0 | 0.027 |
| | Up to incomplete Primary Education | 13 | 44.3 | 11.1 | | |
| SUM OF COMPREHENSION TESTS | Above incomplete Primary Education | 18 | 229.1 | 46.5 | 72.5 | 0.075 |
| | Up to incomplete Primary Education | 13 | 257.9 | 29.1 | | |
| SUM OF EXPRESSION TEST | Above incomplete Primary Education | 18 | 60.5 | 21.4 | 55.5 | 0.012 |
| | Above incomplete Primary Education | 13 | 70.4 | 11.1 | | |

N= Number of assessed patients

M= Mean

SD= Standard Deviation

U= Mann-Whitney Test Value

As far as the distribution of schooling according to gender, it was shown that most subjects have not completed primary education, or, ten men (55.6%) and eight women (44.4%). Among those who had gone beyond the level of incomplete primary education, there were a greater percentage of men, seven or 53.8%, when compared to six women or 46.2%. (Table 3).

Still regarding gender, it was seen that men had a greater score in Comprehension Retention/ Memory of Linguistic Transpositions (Table 5). When comparing the variable age to Oral Language Comprehension and Summoning (Table 6), the highest scores were obtained by participants who were 65 years old or younger.

Table 5 – Distribution of the test means according to gender (ARACJU-SE, 2012)

| TESTS | GENDER | N | M | SD | MANN- WHITNEY | |
|--|--------|----|------|------|---------------|-------|
| | | | | | U | P |
| COMPREHENSION/ RETENTION MEMORY | Male | 17 | 52.6 | 6.4 | 77 | 0.095 |
| | Female | 14 | 48.7 | 5.9 | | |
| LINGUISTIC TRANSPOSITIONS | Male | 17 | 45.1 | 8.2 | 75 | 0.063 |
| | Female | 14 | 38.3 | 16.1 | | |
| SUM OF EXPRESSION TESTS | Male | 17 | 69.0 | 13.8 | 63 | 0.025 |
| | Female | 14 | 59.4 | 21.9 | | |

N= Número de pacientes avaliados

M= Média

DP= Desvio padrão

U= Valor do teste de Mann-Whitney

Table 6 – Distribution of the test means according to age group (ARACJU-SE, 2012)

| TESTS | AGE GROUP | N | M | SD | MANN- WHITNEY | |
|--|----------------|----|-------|------|---------------|-------|
| | | | | | U | P |
| ORAL LANGUAGE COMPREHENSION | Up to 65 years | 16 | 64.00 | 10.4 | 76.5 | 0.084 |
| | Over 65 years | 15 | 59.2 | 8.3 | | |
| SUMMONING | Up to 65 years | 16 | 23.7 | 7.6 | 72.5 | 0.036 |
| | Over 65 years | 15 | 21.5 | 7.0 | | |

N= Number of assessed patients

M= Mean

SD= Standard Deviation

U= Mann-Whitney Test value

Of the 31 study subjects, 26 (83.9%) reported limitation in their daily life activities and five (16.1%) did not report any limitations in this regard. The comparison in between daily life activity and assessment of Summoning (Table 7) revealed that people with this limitation had lower scores when compared to those who did not report limitations.

Based on the percentile cut-off points, 10% of the sample had normal comprehension, while 90% had comprehension aphasia, of which 50% were mild, 30 were moderate and 10% severe. Expression was normal in 40% of the subjects while 60% had an expression aphasia, where 10% was mild, 30% moderate and 30% were severe.

Table 7 - Distribution of the test means according to limitations in daily life activities (DLA)(ARACJU-SE, 2012)

| TEST | LIMITATION IN DLA | N | M | SD | Mann- Whitney | |
|------------------|----------------------|----|------|-----|---------------|-------|
| | | | | | U | P |
| SUMMONING | Yes | 26 | 21.8 | 7.7 | 32.5 | 0.051 |
| | No | 5 | 27.0 | 0.0 | | |

N= Number of assessed patients

M= Mean

SD= Standard Deviation

U= Mann-Whitney Test value

Table 8 - Distribution of the severity of aphasia (ARACJU-SE, 2012)

| ASSESSED SKILLS | NORMAL | | APHASIA | | | | | | TOTAL | | | |
|----------------------|--------|----|---------|----|----------|-----|--------|-----|-------|----|----|-----|
| | | | Mild | | Moderate | | Severe | | Total | | | |
| | N | % | N | % | N | % | N | % | N | % | N | % |
| COMPREHENSION | 03 | 10 | 17 | 55 | 05 | 16 | 06 | 19 | 28 | 90 | 31 | 100 |
| EXPRESSION | 13 | 42 | 12 | 39 | 03 | 9.5 | 03 | 9.5 | 18 | 58 | 31 | 100 |

N= Number of assessed patients

%= Frequency of assessed patients

■ DISCUSSION

A bibliography review research shows that while strokes are predominant in men 85 years old or younger, the prevalence is inverted from this age on, and the female population suffers more from this disease. However, the authors did not reach a conclusion as to which gender is the most widely affected, since there is much divergence in the studies that were conducted⁷.

In the present study, however, there was a predominance of men, fact that corresponded to the findings described by other studies in this field, for example the validation of the Riode Janeiro Test, where 27 men (58.7%) and 19 women (41.3%) were assessed¹², the study conducted at the Neurology Speech-Language Pathology out-patient service at Hospital das Clínicas of the Medical School of the University of São Paulo – FMUSP – that studied 192 aphasic subjects in the period in between 1995 and 2000, where 100 or 52% were men and 92 or 48% were women²³, as well as a study with 111 patients with a stroke diagnosis admitted to a Physical Medicine and Rehabilitation hospital unit in Lisbon, Portugal, where 56.8% of the subjects were men and 43.2% were women²⁴.

According to the data and to the proposition of the Rio de Janeiro Test, the subjects with incomplete primary education had lower scores in the questions pertaining to colloquial, automatic and associative language; choice of oral prepositions, syntax and story comprehension with visual support; absurd story comprehension and comprehension of orders; summoning classes and categories; and repetition of oral prepositions.

A wide age interval is found in researches in this field, as, for example, ages varying in between 11 and 83²³, 19 and 80¹³ and 15 to 84¹⁸. The occurrence of a larger age interval in these studies may be justified by the fact that the inclusion criteria accepted other cerebral lesions as well as stroke.

This study's affirmative about the significance of stroke occurrence in the Brazilian Population is supported by a similar study in which, of the 92

participating subjects, 111 or 58% of the sample had a stroke as the etiological factor of their cerebral lesions²³.

Researchers^{5,8,25} have associated the occurrence of stroke to the presence of risk factors which was also shown in the present study. There is a suggestion that strokes and other cerebrovascular disorders occur less frequently in young patients, younger than 20 years of age, possibly for their being less vulnerable to the risk factors⁶.

It has been reported⁶ that the majority of the population suffering from strokes is in between 41 and 64 years of age. In agreement with this statement, it is mentioned that strokes many times occur at the peak of the subject's creative and professional capacities²⁴. The percentage of patients who had an aphasic condition after a stroke ranges from 20 to 38%¹⁵. In the Western hemisphere, strokes are considered the most relevant cause of functional incapacity²⁴ occurring mainly in adults and in the elderly³.

The findings in the present study are similar to the ones mentioned above, and show that aphasia occurred mainly in those who were in a productive phase concerning their work and intellectual capacities. This occurrence brings severe social and cultural damages to the lives of the individuals²⁶, such as limitations in their daily life activities²⁷ leading to deficits in both linguistic and non-linguistic skills²⁸, as well as generating emotional stress²⁹.

As they were younger and had more years of schooling, the subjects of this study who were younger than 65 scored higher when compared to the remaining individuals, in the assessment of word comprehension by fields of association, of simple and complex sentences, and performed better in the interpretation of syntactic and spatial concepts.

Similar to these findings are the data from a study conducted at the Neurology Speech-Language Pathology out-patient service at the Hospital das Clínicas of the Medical School of the University of São Paulo – FMUSP. In this study, the BDAE was used and, when comparing two groups, one composed of normal and the other of aphasic

subjects, the authors verified that the variables age and schooling influenced the performance in both groups¹⁸.

The influence of schooling is also evidenced by the better performance of men in the present study. Because they have more years of schooling, they made better choices of oral prepositions, had better comprehension of syntactic options and of a story with visual aids, according to the Rio de Janeiro Test. In agreement, authors report that low schooling levels in the studied sample, aside from the location of the lesion, was an aspect influencing in poor performance in writing tests²². Other studies also report that the level of schooling may justify the communication difficulties faced by aphasic subjects²⁶.

In a study conducted in two University Hospitals with 741 stroke patients, 30% of them had aphasia⁶. However, the present study reveals that the most subjects in the sample had aphasia, of which 90% had comprehension aphasia and 60% expression aphasia. This result is similar to those of a study that used the Boston Diagnostic Aphasia Examination (BDAE), the Boston Naming Test (BNT) and the Token Test, where the authors found that of the 192 evaluated subjects, 70% were aphasic, 17% had functional communication disorders and 7% were normal²².

■ CONCLUSION

The variables: gender, schooling and age have been shown to influence test performance, and it was verified that subjects of the male gender, with less than 65 years of age and who have complete primary education score higher than the rest. The data also show that a greater percentage of the sample has more disorders in comprehension than in expression.

Since men have more stroke risk factors, and since those with more risk factors have more strokes, it may be said that men suffer more strokes and, therefore, suffer more from aphasia than women.

This study has also shown that people who are younger than 65 years of age have more strokes and therefore more aphasia, which shows that aphasia manifests in human beings mainly in a productive age group. Even so, males and subjects younger than 65 had better performances as they have either completed or studied beyond primary education level.

In regards to schooling, the hypothesis that the sample would be composed by more patients with low schooling levels, or, up to incomplete primary education was confirmed, a fact that justifies the choice for eliminating reading and writing tests in this study. The results show that people who finished their primary education or went beyond that had better performance in most of the tests.

It is believed that the study of linguistic disorders of aphasics may aid professional in several fields of knowledge to shed a broader gaze at the subject and not only on the disease, which will favor a better understanding of the patient and, consequently on the care provided to them, which will favor a better prognosis.

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RESUMO

Objetivo: analisar a ocorrência de distúrbios de linguagem nos indivíduos que sofreram Acidente Vascular Cerebral. **Métodos:** foi avaliada a linguagem de todos os pacientes acometidos por Acidente Vascular Cerebral, atendidos de fevereiro a agosto de 2012, no setor de fisioterapia de centro de referência em educação e saúde do Estado de Sergipe. A avaliação foi baseada no Teste do Rio de Janeiro (2005). A análise dos dados foi realizada por meio de estatística descritiva e probabilística através da distribuição de frequência, cálculos da média, desvio padrão e percentis, do Teste U de Mann-Whitney e Qui-Quadrado. **Resultado:** foram encontrados 31 indivíduos, de ambos os gêneros, com idade variando de 30 a 94 anos. Foi evidenciado que as variáveis: gênero, escolaridade e idade, influenciam no desempenho do teste, verificando-se que o gênero masculino, sujeitos abaixo de 65 anos e os com escolaridade acima de fundamental incompleto pontuam mais. **Conclusão:** maior percentual da amostra apresenta mais alteração na compreensão do que na expressão.

DESCRITORES: Acidente Vascular Cerebral; Afasia; Transtornos da Linguagem; Testes de Linguagem

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