Original Article

Artículo Original

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Relationship between the caregiver's report on the patient's spontaneous-speech and the Brief Aphasia Evaluation

Relación entre el informe del cuidador sobre el habla espontánea del paciente y la Evaluación Breve de la Afasia

Keywords

Aphasia
Caregiver
Neuropsychological Tests
Speech-Language Pathology
Cognition

ABSTRACT

Purpose: To study the relationship between the caregiver's perception about the patient's impairment in spontaneous speech, according to an item of four questions administered by semi-structured interview, and the patient's performance in the Brief Aphasia Evaluation (BAE). **Methods**: 102 right-handed patients with focal brain lesions of different types and location were examined. BAE is a valid and reliable instrument to assess aphasia. The caregiver's perception was correlated with the item of spontaneous speech, the total score and the three main factors of the BAE: Expression, Comprehension and Complementary factors. The precision (sensitivity/ specificity) about the caregiver's perception of the patient's spontaneous speech was analyzed with reference to the presence or absence of disorder, according to the professional, on the BAE item of spontaneous speech. **Results**: The studied correlation was satisfactory, being greater (higher than 80%) for the following indicators: the item of spontaneous speech, the Expression factor and the total score of the scale; the correlation was a little smaller (higher than 70%) for the Comprehension and Complementary factors. Comparing two cut-off points that evaluated the precision of the caregiver's perception, satisfactory results were observed in terms of sensitivity and specificity (>70%) with likelihood ratios higher than three. By using the median as the cut-off point, more satisfactory diagnostic discriminations were obtained. **Conclusion**: Interviewing the caregiver specifically on the patient's spontaneous speech, in an abbreviated form, provides relevant information for the aphasia diagnosis.

Descriptores

Afasia
Cuidador
Pruebas Neuropsicológicas
Patología del Habla y Lenguaje
Cognición

RESUMEN

Objetivo: Estudiar la relación entre la percepción del cuidador sobre el deterioro en el habla espontánea del paciente, según un ítem de cuatro preguntas administradas mediante entrevista semiestructurada, y el desempeño del paciente en la Evaluación Breve de la Afasia (EBA). **Método**: Se examinaron 102 pacientes diestros, con lesiones cerebrales focales de diferente tipo y localización. EBA es un instrumento válido y confiable para la medida de la afasia. Se correlacionó la percepción del cuidador con el ítem de habla espontánea, la puntuación total y los tres principales factores de EBA: el factor de Expresión, el de Comprensión y el Complementario. Se analizó la precisión (sensibilidad-especificidad) de la percepción del cuidador sobre el habla espontánea del paciente, respecto de la presencia o ausencia de trastorno, según el profesional, en el ítem de habla espontánea de EBA. **Resultados**: La correlación estudiada fue satisfactoria, siendo mayor (superior al 80%) para los siguientes indicadores: el ítem de habla espontánea, el factor de Expresión y la puntuación total de la escala; la correlación fue un poco menor (superior al 70%) para el factor de Comprensión y el Complementario. Comparando dos puntos de corte que evaluaron la precisión en la percepción del cuidador, se observaron resultados satisfactorios en términos de sensibilidad y especificidad (>70%), con cocientes de probabilidad superiores a 3. Usando la mediana como punto de corte, se obtuvieron discriminaciones diagnósticas más satisfactorias. **Conclusión**: Entrevistar al cuidador específicamente sobre el habla espontánea del paciente, en forma abreviada, proporciona información relevante para el diagnóstico de la afasia.

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INTRODUCTION

Regarding aphasia, a lack of reliability can be observed between what the patients report about their disorders and what their relatives report[1]. Simultaneously, the difficulty of patients with aphasia to transmit reliable information regarding their symptoms makes caregiver observations essential for detecting, diagnosing and evaluating the loss or recovery of function in these patients (see, e.g.,[2]).

Because of this reliance on the ratings of relatives or close friends to assess the status of the patient with aphasia, there is a great need to validate such rating measures[3]. However, there are few studies aiming to validate these qualifications, particularly those aimed to detect which are the most relevant. An exception to this lack of background is a previous study which indicates that family members or partners typically rate the effectiveness of the aphasia patients' communication skills, largely based on expressive language[3]. This study[3] is interesting because, within expressive language, the notion of loss of speech, whether total or partial, is essential to the definition of aphasia, in particular, to the etymological definition of the term[4]. The loss of spontaneous speech, or the impairment in the ability to hold a conversation in a natural situation, is supposedly perceived on the first instance by those close to the patient. However, there are few studies on the validity of this perception as an individual attribute for the detection of aphasia. Commonly, this measure is included within a larger set of measures or items[1].

The use of a large number of items to evaluate a single function is psychometrically convenient if we want to achieve internal consistency within that function. However, if the same procedure is used to achieve internal consistency in multiple functions, which will be evaluated on the patient, the duration of the evaluation may be over extended. This would risk the number of functions to be assessed and/or force to reduce those multiple functions to the most relevant. Shortening evaluation procedures is crucial in areas where it is necessary to collect in a single session all the required information for a certain objective. These may include experimental neurofunctional studies or clinical studies in hospital settings where quick decisions must be made, in particular, low-resource Hospitals such as public Hospitals.

The study of the validity of an item, supposedly representative of a function, should be verified by external consistency with other valid indicators of the same function (see, e.g.,[5]) thus measuring, for example, the predictive or concurrent validity of that function.

Studying multiple functions with very few items per function, or studying very few functions with multiple items per function, should be complementary approaches. Although it is necessary (and methodologically correct) to verify the properties of both approaches, only the second approach has been more widely spread. Nevertheless, there are some studies which verify the relevance of the first approach, with good results[6-10]. The premise guiding the first approach would be: if simple measures with very few items per function can prove validity as representatives of more extensive functions, it increases the probability of constructing multivariate or multifunctional instruments (also characterized for their efficiency) composed of a variety of these simpler measures.

Neuropsychiatric diagnoses, including those of aphasia and particularly those referred to spontaneous speech, often involve a multiplicity of items or indicators. If they are not embodied in exhaustive operational definitions, they can make interpretation so difficult that, finally, the diagnosis ends up being intuitive, according to ordinal scales. This difficulty is seen even in well-known batteries, used as criterion for validation of other scales[7,11].

Spontaneous speech is a comprehensive attribute that, similar to the neuropsychiatric diagnoses, can be very useful for formulating clinical hypotheses of different nature during the first contact between doctor and patient.

Taking into account that spontaneous speech is usually classified globally or intuitively due to the large number of indicators that are frequently involved[7,11], in this study it was decided to evaluate specifically the overall perception of the caregiver on the patient's spontaneous speech. This was done considering that the use of a single item may allow more possibilities than the evaluation of multiple items, in terms of measurement control. In addition, this perspective may reduce the interpretative difficulty and/or length of the evaluation in the interviewee.

At present, there is a tendency to use a single item or psychological test, as a key measure to make inferences about the meaning of some other attribute. In the field of neuroscience, for example, specific psychological tests tend to be used to evaluate specific areas of the brain. Therefore, identifying and validating these key psychological measures is an indispensable task.

Within this framework, many psychological attributes are evaluated or validated on the basis of spontaneous speech[11-19], considered as a key attribute. However, there are few studies on the validity of spontaneous speech itself, in particular, on how it is perceived by caregivers in adults with acute aphasia. There are not any studies either where a single interview item, simple but well designed, has been validated in its ability to detect a complex linguistic function. Specifically, it is necessary to know if using a simple and global measure of spontaneous speech, under the format of an interview without additional material resources, results similar to that obtained with a more extensive, valid and objective language scale.

The evaluation of spontaneous speech by close friends or relatives, in a habitual environment, has the peculiarity of being more casual and less intricate than the evaluation in more formal research contexts, with more sophisticated techniques. As both approaches (casual and formal) are necessary in the field of measurement[18], it is interesting to see to what extent there is a coincidence in the evaluation of spontaneous speech interpreted by two different interlocutors, such as the professional and the caregiver, who observe the patient in two different contexts.

The idea that underlies this research is to try to discover simple and valid measures that can then be incorporated into efficient comprehensive instruments.

Within the non-verbal function, for example, it has previously been proved[9] that a short scale, consisting of only four categories of evaluation (from 0 to 3), was sufficient to classify interest

groups, thus demonstrating the validity of the scale, among other psychometric properties. Following such model, this study intends to analyze the relevance or concurrent validity of a single item of the caregiver's interview, consisting of four questions and four final categories of evaluation referred to the verbal function of the patient, through its relationship with multiple reliable and valid measurements of aphasia. These measurements were represented by the Brief Aphasia Evaluation (BAE)[6,7,10].

Explicitly, the main objective of the present study was: to study the relationship between the caregiver's perception of the patient's spontaneous speech impairment, as expressed in an interview item consisting of four questions, and the patient's performance in the BAE both in its spontaneous speech item and in the main factors of the scale[6,10]. The complementary objective of the present study was to analyze the accuracy (sensitivity-specificity) of the caregiver's perception of the patient's spontaneous speech, regarding the presence or absence of disorder according to the professional in the BAE spontaneous speech item.

METHODS

One hundred and two right-handed, native Spanish speakers with unilateral focal brain lesions of different type and location were studied. Patients were recruited from the Department of Neurology and Neurosurgery at Cordoba Hospital, a public hospital for adults. Lesions were confirmed by computed tomography and/or magnetic resonance imaging. None of the patients had any associated neurological disease (prior or simultaneous). The patients who were excluded were those who suffered from visual agnosia, who were unable to identify objects or cards, or who did not have a minimal and clear comprehension and expression of affirmative and negative responses, whether verbal or nonverbal[7,10].

The initial sample consisted of 105 patients, of whom one patient was excluded for probable visual agnosia, and two patients were excluded because they did not have a clear and minimal comprehension and expression of affirmative and negative responses. The final sample consisted of patients of 47.88 ± 14.24 (mean ± SD) years of age, 8.18 ± 3.94 years of study and 10.95 ± 25.86 months of disease duration; with a percentage of 47% (48) women; 66% (67) lesions of the left hemisphere, 26.47% (27) anterior hemispheric lesions (frontal), 30.39% (31) posterior hemispheric lesions (temporal, parietal or occipital), 35.29% (36) anteroposterior lesions (located in the frontal lobe and some of the posterior lobes, or in regions located between the frontal lobe and the posterior lobes), and 7.8% (8) subcortical lesions located in inferior structures as the thalamus, the basal ganglia, the internal capsule, etc. Focal brain lesions classified according to their site and etiology are shown in Table 1.

The types of lesions were: arteriovenous malformation 7.84% (8), subdural hemorrhage 1.96% (2), benign tumor 9.80% (10), malignant tumor 48.04% (49), aneurysm 3.92% (4), mesial temporal sclerosis 2.94% (3), ischemic stroke 6.86% (7), hemorrhagic stroke 7.84% (8), cyst 4.90% (5), traumatic brain injury 2.94% (3) and temporal lobectomy 2.94% (3). Since malignant tumors represented the most frequent type of lesion, the cells with fewer cases, that is, the cells that represented the rest of the lesions were grouped. Table 1 shows that information (benign vs. malignant lesion) in interaction with the lesion site. As can be seen in cross tabulation, all partial comparisons were non-significant according to chi square (χ^2). Additionally, it is reported that the comparison between subcortical and cortical lesions, according to the side of the lesion, was also non-significant ($\chi^2 = 0.23$, df = 1, p = 0.89).

For the characterization of the sample for the type of aphasia (expressive-comprehensive), an operational definition based on three levels of impairment was used: 0% to 33%: severely affected, 34% to 66%: moderately affected, 67% to 100%: slightly affected to normal performance[20]. For that characterization it was also taken into account that, according to a previous BAE study[10], there were no significant differences between patients with right hemisphere injury and healthy participants in any of the BAE factors.

In this sample, there were 28% (19/67) of patients with lesions in the left hemisphere, which had a severely affected performance in the Expression factor; of them, only 11% had predominantly or purely expressive aphasia, with Comprehension slightly affected to normal. In contrast, there were 13% (9/67) of patients in which Comprehension was severely affected; of these, also Expression was severely affected in 89%. None of

Table 1. Classification of focal brain lesions according to their site and etiology

Site		Etiology		
A-P, SC	Side	Malignant tumors	Other Injuries	Total Rows
A	L	76.92% (10)	57.14% (8)	18
A	R	23.08% (3)	42.86% (6)	9
Total		13	14	27
		$\chi^2 = 1.19$; df =1; p < 0.28		
AP	L	70.00% (14)	62.50% (10)	24
AP	R	30.00% (6)	37.50% (6)	12
Total		20	16	36
		$\chi^2 = 0.23$; df=1; p < 0.64		
P	L	56.25% (9)	73.33% (11)	20
P	R	43.75% (7)	26.67% (4)	11
Total		16	15	31
		$\chi^2 = 0.99$; df=1; p < 0.32		
SC	L	0.00% (0)	62.50% (5)	5
SC	R	0.00% (0)	37.50% (3)	3
Total		0	8	8
		$\chi^2 = 0.00$; df=1; p =1		
Total Colum		49	53	102

The value in parentheses after the percentage, indicates the absolute number of cases; in the marginal cells only the absolute number of cases is shown
Captions: A = anterior (frontal); P = posterior (temporal, parietal or occipital); AP = antero-posterior; SC = subcortical; L = left; R: right

the patients with moderately or severely affected comprehension (33% overall (22/67)) had slightly affected to normal expression. Considering the whole sample, the patients with moderately or severely affected comprehension (22% (22/102)) had lesions in the left hemisphere and the same occurred with 29% (30/102) of patients with moderately or severely affected expression. There were 26% (27/102) of patients with moderately or severely affected performance in the total BAE score, of which 100% also had lesion in the left hemisphere.

For the accomplishment of this work, all the participants (or their caretakers) signed the informed consent form. Participants received no payment for their participation. This research was approved by the Córdoba Hospital Research and Ethics Committee (Act No. 64 of 2011, as a continuation of previous approvals).

The BAE did not represent any risk for the participants who, in all cases, were alert and willing to complete the whole test, independently of their relative capacity to perform some of the sub-tests or items in particular.

The BAE is a brief, valid and reliable scale of aphasia[6,7,10]; is distributed free of charge in Spanish and English[21,22] and has been shown to be useful to detect the presence and magnitude of aphasia, as well as its components or symptoms, from the acute stage of the disease[10]. It was designed to be administered by the bed of the patient. According to confirmatory factor analysis[10], there is a hierarchical organization in the functions that BAE evaluates: first, there is a more general or comprehensive factor (represented by the total score), homogeneously verbal, which organizes the main factors and/or of the more specific functions listed below: a factor of Comprehension (which includes auditory comprehension and reading), another factor of Expression (which includes repetition, naming, speech, and writing), as well as the Complementary factor that includes the sub-functions of praxia, attention and memory; finally, these three factors are followed by the most specific, individual and correlated functions[10].

The BAE spontaneous speech item belongs to the speech function, in the Expression factor[10] and corresponds to the second item of BAE, after the greeting. This item explores the patients' ability to describe their own condition. The interviewer's question is: "Tell me what happened to you; why are you here?" The quantity and quality of the expression is evaluated from 0 to 3, according to the following guidelines[21,22]:

The quantity of language the patient has produced (how much he/she speaks) represents fluency and has to do mainly with the articulation or linking mechanisms, that is to say, with the use of an appropriate sequence in the units of language, (examples of alterations: the patient does not speak, uses just syllables or isolated words, telegraphic language, agrammatic speech, brief phrases, dysarthria, paraphasias (mainly phonemic), verbosity, etc.). The quality of what is expressed (what the patient speaks) has to do with the information content and the ability to retrieve words (examples of alterations: circumlocution, paraphasias (mainly semantic), ´word salad, ´ jargon, etc.). Only for screening purposes, just four categories will be considered. (Note: cases of disinhibition in fluency or pure verbosity are discarded; stuttering is also discarded).

Evaluation:

3 - correct or normal (in quantity and quality).

2 - slight reduction in the quantity or distortion in the quality.

1 - severe inhibition in the quantity or distortion in the quality.

0 - absence of speech (in quantity or quality).

It will also have to be specified whether the problem is related to production or fluency (F), to content or retrieval (C) or both (F and C). In order to get a better diagnostic interpretation, record and describe separately the alterations that justified that classification (complementary qualitative description, not computed in the database)[21,22].

The questions to the caregiver (administered through a semi-structured interview) aimed to measure the level of impairment in the patients' spontaneous speech (in their daily environment). Questions were as follows:

Does the patient: 1) have trouble speaking?, i.e,, does he/she speak less than before or not as clearly as before?; 2) have difficulty to find words to name well-recognized subject/objects?; 3) change one word for another?; 4) have difficulty forming words and sentences?" Each question was accompanied by examples or clarifications (in case the interviewee had doubts or required clarification) and, in the end, the interviewee was asked to evaluate the level of disorder from 0 to 3.

The correlation between the caregiver's report and the BAE performance was analyzed, not only in the spontaneous speech item, but also in the total score and in the main factors of the scale: Expression, Comprehension, and Complementary. In this study, the BAE spontaneous speech item was only analyzed in its quantitative or ordinal component, i.e., it was not considered the qualitative component that evaluates the type of disorder (F, C, F and C). The BAE was double-blind scored with respect to the questions to the caregiver, which were administered by another member of the professional team.

The inferential statistics carried out to analyze the objectives of the present study was the following: The correlation between the caregiver's report and the performance in BAE, in all its indicators, was analyzed using Spearman's correlation coefficient. The accuracy of the caregiver's perception, in terms of sensitivity and specificity, was analyzed by cross-tabulation and χ^2. (Note: The two assessments referring to the patient's spontaneous speech are categorical and involve ordinal scales). To perform the second analysis, the professional's original score in the BAE item measuring spontaneous speech (see above) was divided into two parts, thus using 3 as absence of disorder and <3 as presence of disorder. Two cut-off points were analyzed in the assessment of the caregiver's perception, one considering absence of disorder (0) versus presence of disorder (> 0), and another one considering the sample median as a reference (< = 1 versus >1). A precision > = 70% in

sensitivity and specificity was considered satisfactory, also recognizing as more satisfactory the result that produced a more uniform frequency distribution between sensitivity and specificity and between the positive predictive value (PPV) and the negative predictive value (NPV). This procedure aimed to obtain type I and type II errors uniformly low, as much as possible, thus increasing the magnitude of the likelihood ratio (LR).

RESULTS

Table 2 shows that the studied correlation was satisfactory. In the BAE, considering the spontaneous speech item as well as the expression factor and the total score, the correlation with the caregiver's perception (in absolute values) was higher than 0.80. Considering the Comprehension and Complementary factors of the BAE, the correlation was higher than 0.70. (The correlation resulted negative because BAE measures the level of performance, whereas the caregiver's perception measures the level of disorder).

Table 3 shows the results of the patient's spontaneous speech, describing the accuracy in the caregiver's perception (sensitivity and specificity) as regards the presence or absence of disorder according to the clinical impression of the professional.

The first cut-off point, which measures absence of disorder (0) versus presence of disorder (> 0) in the caregiver's perception, shows that the sensitivity and specificity were greater than 70% (see Table 3 (a)). Specifically, the sensitivity was 1 (49/49) and the specificity was 0.72 (38/53). On the other hand, the PPV was 0.77 (49/64) and the NPV was 1 (38/38), while the LR was 3.53 (1/(1-0.72)). The second cut-off, which measures the absence of disorder for values that are less or equal to the median (< = 1) and the presence of disorder for values that are greater than the median, shows that the sensitivity and specificity were higher than 80% (see Table 3 (b)). Specifically, the sensitivity was 0.82 (40/49) and the specificity was 0.96 (51/53). On the other hand, the PPV was 0.95 (40/42) and the NPV was 0.85 (51/60), while the LR was 20.50 (0.82/(1-0.96)).

(Note: Forty-eight out of the 49 patients who were classified with disorder by the professional in Table 3 (a) had lesions in the left hemisphere and they were also classified with disorder by the caregiver. Of those 48 patients, 83% (40/48) was also classified with disorder by the caregiver in Table 3 (b)).

Table 2. Relationship between the caregiver's perception of the patient's spontaneous-speech and the patient's performance in the Brief Aphasia Evaluation (BAE), with descriptive data for each measure

BAE PERFORMANCE	Correlation with the Caregiver's Perception[1]	Average Descriptive Data for each BAE Indicator			
		Mean	Minimum	Maximum	Standard Deviation
Spontaneous Speech	-0.85	2.11	0.00	3.00	1.08
Comprehension Factor	-0.71	2.43	0.02	3.00	0.78
Expression Factor	-0.86	2.15	0.00	3.00	0.98
Complementary Factor	-0.74	1.80	0.00	3.00	0.99
Total score	-0.81	2.26	0.01	3.00	0.84

The median for the caregiver's perception (which measures level of disorder) was 1, and for the BAE spontaneous speech item (which measures level of performance) was 3
Captions: [1]Descriptive data for the caregiver's perception of the patient's spontaneous speech: Mean: 1.33; Minimum: 0.00; Maximum: 3.00; Standard deviation: 1.25

Table 3. Accuracy in the perception of the caregiver regarding the presence or absence of disorder according to the clinical impression of the professional

a)	CAREGIVER (disorder: 0-3)		Total
PROFESSIONAL (performance: 0-3)	Absence of disorder (0)	Presence of disorder (>0)	
Absence of disorder (3)	38	15	53
Presence of disorder (<3)	0	49	49
Total	38	64	102
	$\chi2 = 55.99$; df: 1; $p<0.0001$.		
b)	CAREGIVER (Median of the disorder = 1)		Total
PROFESSIONAL (performance: 0-3)	Absence of disorder (<=Median)	Presence of disorder (> Median)	
Absence of disorder (3)	51	2	53
Presence of disorder (<3)	9	40	49
Total	60	42	102
	$\chi2 = 63.72$; df: 1; $p<0.0001$.		

Captions: a) = Cut-off point considering absence of disorder versus presence of disorder; b) = Cut-off point considering the median as reference

DISCUSSION

In this study it was observed that briefly interviewing the caregiver specifically about the patient's spontaneous speech provided valid information for the diagnosis of aphasia. Because it is a single item, referring to a key attribute, the caregiver interview could be significantly shortened, without affecting the information provided regarding its relevance.

The present findings support the hypothesis that the use of efficient categorical scales may be a good option when the benefits outweigh the costs; when it can be proved that few categories transmit relevant information, in view of the number of psychological and sample attributes that those categories encompass[9].

Expressive language is considered essential for caregivers when they need to report on the communication ability in patients with aphasia[3]. A previous study in which family ratings were largely predicted by the expressive (not the receptive) language of the patient[3] coincided in part with this study, in which the correlation of the caregiver's perception with the expressive factor of the BAE was higher than the obtained with the comprehensive one.

This study also showed that the correlation of the expressive factor with the perception of the caregiver in spontaneous speech was similar to that observed for the total BAE score. This fact would indicate that the caregiver's perception of spontaneous speech was also a valid indicator of the severity of aphasia as a whole. Likewise, the high correlation of the BAE expressive factor with the caregiver's perception was almost equal to that observed for the BAE item regarding spontaneous speech in particular. These facts would show that the caregiver's perception of spontaneous speech was not only a valid indicator of the severity of the expressive impairment in general, but also a valid indicator of the severity of the expressive impairment for spontaneous speech in particular.

This latter finding, limited to spontaneous speech, was complementary confirmed in terms of a satisfactory sensitivity and specificity of the caregiver's perception, regarding the clinical impression of the professional. When this last impression was used as a reference measure on the presence or absence of disorder in the patient, the indicators of diagnostic accuracy in the caregiver's perception evidenced satisfactory results for the two selected cut-off points. However, a more satisfactory result was observed in the caregiver's perception, for the cut-off point based on the median, than for the cut-off point based on the presence/absence of disorder.

The present study agrees with previous information[23,24], in which other assessments of the caregiver correlated significantly with valid and reliable measures of aphasia. However, such evaluations are not based solely on the spontaneous speech of the patient, but involve a multiplicity of indicators and sub-functions, being more intricate and extensive than the present evaluation.

In spite of this, and regardless of whether other measures can be explored by interviewing the caregiver, the present study emphasizes the importance of studying one of those measures in particular, in addition to any other (equally important) study carried out on the patient.

On the other hand, it is always preferable for practitioners to provide valid diagnostic demonstrations on measures related to a function, through the study of the consistency between multiple and independent sources of information. When patients have impaired cognitive function, or a suspiciously perfect self-report, the validity of their reports may be affected[25]. Consequently, such reports will need to be confirmed by other measures. The same can happen with suspiciously imperfect reports from both the patient and caregivers. In the present study, with this particular sample of patients and caregivers, the reports of the two parties were highly consistent.

The caregiver's perception of the patient's spontaneous speech has been more widely studied in children to assess disorders in language development, not necessarily aphasic[26-29]. In addition, as children have the same difficulty as patients with aphasia to report their disorders, validation of caregivers' reports are also essential in this area. However, and similarly to what is observed in adults, a multiplicity of indicators are generally used in studies with children, which can extend evaluation, affect interpretation and/or inhibit parents or caregivers who are less prone to conduct the interview.

Within this scope, inventories are usually validated, i.e., interpretations on multiple aspects of the child's language (including interpretations on spontaneous speech) are validated with some indicators based on real samples of spontaneous speech. Conversely, there are few studies which validate the interpretation of spontaneous speech itself, with multiple aspects of language. (It is worth to clarify that, excluding the spontaneous speech item of the BAE, the rest of the items of the scale resemble those used in the experimental research, where the score is related to the number of responses and implies a more direct relationship between the conceptual and operational definition).

Considering specifically the participants of this study, there is a characteristic that may have influenced results by facilitating the interpretation: the perception of an acute deficit or of functions that, relatively suddenly, are impaired in these patients, makes a difference with others patients, where the caregiver's interpretation may be a little more difficult; for example, patients with progressive aphasia, or with a disorder in the development of non-aphasic language.

However, the detection of changes in the spontaneous speech of the patient, based on a reference criterion specific to the caregiver's environment, is pertinent to what was found in this study and can be applied to other pathologies as well. Moreover, once the validity of a single interview item to detect impairment in the patient's spontaneous speech has been verified, the addition of similar items to achieve internal consistency, or to construct more extensive tests on the same attribute, becomes a simpler task. Likewise, the exploratory results obtained here were significant and give rise to a later psychometric study, without the need to extend the time of administration of the involved tests. Explicitly, since the interviewer's item consisted of several questions, they can be computed separately, thus studying the internal consistency of the items. When the sample of participants presents a good level of variance (as is the case of these patients) and the underlying attribute is univocal, a

high internal consistency can be achieved, even combining very few items[7].

Spontaneous speech is often used to validate different neuropsychiatric attributes[11-16]. But if multiple items representative of spontaneous speech are used, and it is also observed that the patient presents, for example, aphasia, subjecting him/her to the same failure over and over again can be harmful. That is why it is necessary to complement different valid diagnostic indicators, including subjective and objective interpretation measures.

Related to this, the following can be observed: the discovery of key individual items, representatives of comprehensive functions, which have been legitimized with other valid, reliable and extensive measures related to the same functions, allow these items to be incorporated at different scales, with the objective of reducing an evaluation on the same function, or with the objective of constructing other scales in which those functions are relevant. For example, if the key item has been validated to measure aphasia, such item can then be selected to abbreviate an aphasia scale, or it can be incorporated into a dementia scale, in which impairment in language represents an essential component to be studied.

Finally, and considering that both the spontaneous speech evaluation model designed for the caregiver and the one designed for the professional, represent valid and simple measures, it could be proposed that they are distributed to any observer of the patient, replacing the technical words with their meaning. Informing the eventual observer of the patient about the difference between confusing objects and confusing names, for example, is essential for the identification of aphasia and could help early detection. (To give an idea of how to guide the caregiver in this aspect, it is suggested to see the "orientation test for aphasic patients" in the BAE instructions, or the evaluation of visual *gnosis* by viso-visual recognition on the BAE optional card[21,22]).

CONCLUSION

The present results demonstrate that interviewing the caregiver, specifically about the spontaneous speech of the patient, provides relevant information to the diagnosis of aphasia. Accordingly, and because it is a single item, the interview with the caregiver could be significantly shortened, without being affected the validity of the information provided. The correlation of the caregiver's perception with the BAE, a valid and reliable aphasia scale, proved to be more satisfactory for the BAE expressive factor than for the BAE comprehensive or complementary factors. The correlation of the caregiver's perception with the BAE spontaneous speech item, the total score and the expressive factor was highly significant, with a consistency higher than 80% for the three evaluations.

The present results also show that interviewing the caregiver specifically about the patient´s spontaneous speech adds significant information to confirm the presence of aphasia: By using two cut-off points to measure the diagnostic accuracy in the caregiver's perception (relative to the professional), satisfactory results were observed in terms of sensitivity and specificity, with likelihood ratios higher than 3. The sensitivity and specificity were higher than 70% when the presence of the disorder was considered as reference, and were higher than 80%, when the median was considered as reference.

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