CoDAS
ISSN 2317-1782 (Online version)

Case Report
Relato de Caso

The effectiveness of speech-language therapy at the discursive level: a case study of cognitive-linguistic deficit in dementia

A efetividade da terapia fonoaudiológica no nível discursivo: estudo de caso de distúrbio linguístico-cognitivo na demência

Viviane Faria Marquete[1]
Tania Afonso Chaves[2]
Simone dos Santos Barreto[2]

Keywords

Cognition
Speech, Language and Hearing Sciences
Dementia
Language Disorders
Rehabilitation of Speech and Language Disorders

ABSTRACT

People with dementia present cognitive, language and behavioral impairments. The language deficits can be identified in the speech of these patients in the early stages. However, there are still few studies about the effectiveness of speech-language therapy in these cases. This study aimed to describe the language manifestations observed in the speech of a patient with a linguistic-cognitive disorder and to analyze the effectiveness of speech-language therapy. A longitudinal single-case study with a patient with mild to moderate mixed dementia was carried out. The patient underwent pre- and post-speech-language therapy evaluation with the Oral comprehension and the Narrative discourse subtests of the MTL-Brazil Battery and The Dog Story test. We observed severe impairments of the oral comprehension and deficits involving the micro and macrolinguistic dimensions of the discourse, with a score of 2/10 in the oral discourse evaluation index. After the speech-language therapy, the patient achieved adequate performance in the Oral Comprehension subtests (words, sentences and text) and the Oral Narrative discourse (number of words and information units) of the MTL-Brazil Battery. In The Dog Story test, the participant obtained better performance in the discourse production regarding the items lexical change and syntactic complexity (microlinguistic dimension) and macroproposition (macrolinguistic dimension), achieving a score of 5/10 on the index. It is possible to state that the speech-language therapy was effective in the short term for this patient with linguistic-cognitive disorder and impairments in the discursive level of the language.

Descritores

Cognição
Fonoaudiologia
Demência
Transtornos da Linguagem
Reabilitação dos Transtornos de Fala e da Linguagem

RESUMO

Pessoas com demência apresentam alterações cognitivas, de linguagem e de comportamento. As alterações da linguagem podem ser identificadas no discurso desses pacientes já nas fases iniciais. Contudo, ainda há poucas pesquisas sobre a efetividade da terapia fonoaudiológica nesses casos. Os objetivos deste estudo foram descrever as manifestações linguísticas presentes no discurso de um paciente com distúrbio linguístico-cognitivo e analisar a efetividade da terapia fonoaudiólogica. Foi realizado um estudo de caso único longitudinal, com participante com demência mista em fase leve à moderada, submetida à avaliação pré e pós-terapia fonoaudiológica. Foram utilizados os subtestes de Compreensão oral e de Discurso narrativo oral da Bateria MTL-Brasil e o teste *The Dog Story*. Na avaliação, a paciente apresentou alteração grave da compreensão oral e alteração nas dimensões micro e macrolinguística do discurso, obtendo pontuação 2/10 no índice de avaliação do discurso oral. Após a terapia, a paciente obteve resultados dentro do esperado nos subtestes de Compreensão oral (palavras, frases e texto) e de Discurso narrativo oral (número de palavras e unidades de informação) da Bateria MTL-Brasil. No teste *The Dog Story*, a participante obteve melhor desempenho na produção do discurso em relação aos itens alteração lexical e complexidade sintática (dimensão microlinguística) e macroproposição (dimensão macrolinguística), alcançando escore de 5/10 no índice. É possível afirmar que a terapia fonoaudiológica foi efetiva a curto prazo para esta paciente com distúrbio linguístico-cognitivo e alterações no nível discursivo da linguagem.

Correspondence address:
Simone dos Santos Barreto
Departamento de Formação Específica em Fonoaudiologia, Instituto de Saúde de Nova Friburgo, Universidade Federal Fluminense – UFF
Rua Dr. Silvio Henrique Braune, 22, Centro, Nova Friburgo (RJ), Brasil, CEP: 28625-650.
E-mail: simonebarreto@id.uff.br

Recebido em: January 31, 2020

Aceito em: April 16, 2020

Study conducted at Universidade Federal Fluminense – UFF, Nova Friburgo (RJ), Brasil.

[1] Curso de Graduação em Fonoaudiologia, Instituto de Saúde de Nova Friburgo, Universidade Federal Fluminense – UFF – Nova Friburgo (RJ), Brasil.

[2] Departamento de Formação Específica em Fonoaudiologia, Instituto de Saúde de Nova Friburgo, Universidade Federal Fluminense – UFF – Nova Friburgo (RJ), Brasil.

Financial support: nothing to declare.

Conflict of Interest: nothing to declare.

INTRODUCTION

Illness and death are characteristics of human beings, present at any age, and not necessarily related to isolated age advancement. However, the organism becomes more susceptible to illness due to aging. Currently, more than 35 million people worldwide have some kind of dementia and that number could double by 2030, according to data from the World Health Organization in a report from 2012 (WHO)[1].

Dementia is diagnosed when both cognitive and behavioral symptoms are observed and as the disease progresses, it will interfere with the individual's abilities, work, or basic activities of daily living, and will necessarily represent a decrease in the individual's functioning and performance[2]. The skills of thinking, perceiving, feeling, reasoning, and responding to various stimuli are connected to cognition and mental functioning. A cognitive decline is a common characteristic of individuals who have clinical manifestations of dementia[3].

As one of the cognitive functions that may be altered in dementia, we believe that language evaluation must be performed early, so that it can contribute to the understanding of altered linguistic-cognitive skills in the patient[4].

Before the beginning of any rehabilitation program, we need to define the cognitive profile of each patient, outlining their deficits and preserved aspects of cognition. Such data are relevant for the proposed intervention to be appropriate for the patient's intellectual and cultural level[5].

There is no established treatment that can heal or reverse the deterioration caused by dementia. In this context, speech-language therapy intervention should enable the patient to develop strategies that help to improve both family and social interactions, compensating for linguistic deterioration. The objective should be to develop and maintain identity, transmit and receive information about self-care and create communicative strategies that seek to alleviate difficulties in understanding and producing language, through oral and visual strategies that enable the elderly to adjust and adapt to changes, avoiding social isolation, anguish, and depression[6].

According to the increase in the world's elderly population and the growing change in the population pyramid, there is a need to prevent, diagnose and treat causes of cognitive impairment that are present in this age group[7]. Regarding communication, the discursive process in the language of the elderly must be carefully analyzed, to ensure that they can communicate in the most effective way possible, considering the moment of life in which they are and the need to establish a dialogue with their interlocutor[2].

Since there are still few published studies on speech-language therapy in cases of language disorders resulting from dementia, this study seeks to investigate the process of rehabilitation of the language production of a patient with linguistic-cognitive disorders. The specific objectives of this study are to describe the linguistic manifestations present in the discourse of this patient and to analyze the effectiveness of speech-language therapy for improving the communicative process at the discursive level in the case studied.

CASE PRESENTATION

This is a single longitudinal case study, approved by the Research Ethics Committee of the proposing institution (opinion 2,044,348). The individual's participation was conditioned to the acceptance of the invitation as well as the signing of the informed assent term by the participant and the free and informed consent term by her legal guardian.

The participant in this research is an elderly woman, 78 years old, with low education, institutionalized for just over four years in a long-term care facility for the elderly population (LTCF). She presented a speech-language diagnosis of the linguistic-cognitive disorder, characterized by moderate impairment of oral comprehension, emissive impairments (anomies, failures of coherence and cohesion, alternation of discursive turns, and the predominant use of syntactically simple sentences), besides deficits in memory of short term, attention, and temporal and spatial disorientation. She had a multidisciplinary diagnosis of probably mixed dementia, from mild to moderate, with a Clinical Dementia Rating of one and Mini-Mental State Examination (MMSE) [8] and Geriatric Depression Scale (GDS) of 14 points each.

She also had behavioral changes (aggressiveness and a sudden change in mood) and had been using Citalopram for approximately 12 months. The patient had a history of ischemic stroke for more than seven years, evolving with motor sequelae in her left leg, and alcohol abuse, a habit that had been interrupted for eight years.

Since her admission to the LTCF, she has not shown good adaptation and expressed a desire to return to the former home, despite not having contact with her family. The patient did not participate in activities in the institution's routine and, therefore, her social life was restricted. She had a high level of dependence, needing help to perform activities of daily living.

We assessed the participant before the start of speech-language therapy and three months after to investigate linguistic-discursive skills (comprehension and emission). The following instruments were used for the evaluation: Montreal Toulouse Language Assessment Battery - MTL Brazil[9] and The Dog Story test[10].

In the MTL-Brazil Battery, we used the following subtests: oral comprehension of words, sentences, and text, and oral narrative discourse. The listening comprehension subtests were used to assess oral comprehension of different stimuli with increasing syntactic complexity. In the MTL-Brazil Battery oral narrative discourse subtest, the objective is to evaluate the ability to produce a narrative, based on the presentation of a figure (action scene).

In the Dog Story test, the objective is to evaluate the ability to produce a narrative, based on a sequence of figures that form "The story of the dog". The narrative consists of a sequence of seven figures in black and white. The participant was instructed to order them and tell a story based on these figures. As she had difficulty organizing them, the examiner presented the correct sequence.

Since there are no criteria for the classification of normality for the elements of discourse analysis, with consensus in the literature, we used the Oral Discourse Evaluation Index in Patients with

Alzheimer's Disease (AD) proposed by Lira[11,12]. The index was developed to more effectively assess language through discourse in AD, using the least possible variables, which can better identify the change in performance. It considers the aspects of the macrolinguistic dimension (complete propositions related to the content, macropropositions, and cohesive links) and microlinguistics (lexical changes and syntactic complexity). The sum of the scores of all five aspects makes up the final score of the index, whose maximum value is 10 and whose cut-off score is 5.5.

We defined the proposed therapy program based on the results of the complete speech-language therapy assessment. We performed 13 individual therapeutic sessions with weekly frequency and duration of 45 minutes in each session. The general therapeutic objectives were to adjust the emissive and receptive aspects of oral language. Chart 1 shows specific data on the therapeutic program.

Table 1 shows the findings of the two assessments, before and after the speech-language therapy, with the subtests of the MTL-Brazil Battery.

The participant presented a descriptive discourse in the pre- and post-therapy moments, but with more details and information in the reassessment. We identified flaws in the two assessments regarding coherence and cohesion, with improved performance after the therapy.

Table 2 shows the data from the discourse analysis carried out using The Dog Story test, according to the Oral Discourse Assessment Index in Patients with AD, in the pre- and post-speech-language therapy moments.

DISCUSSION

Performance on the formal tests

In the pre-therapy assessment, with the MTL-Brazil Battery, the patient obtained lower scores than we expected, considering her age and education, in the subtests of Oral comprehension of words, sentences, and text, as shown in table 1. Taking into consideration the patient's clinical picture and the diagnosis of mild to moderate dementia, severe impaired oral comprehension would not be expected in this phase of dementia. According to the literature, flaws in complex sentences and texts would be expected, as described by Ortiz et al.[4] The patient had a low level of literacy, attentional deficit, depression, behavioral changes, and institutionalization, which could justify the poor performance in this initial assessment, even at the level of word comprehension.

After the therapeutic intervention of 13 sessions, the reassessment showed a significant improvement in the scores of the oral comprehension subtests. The significant improvement in these tests can be attributed to the effectiveness of the speech-language therapy, since these MTL-Brazil Battery subtests have a high degree of test-retest reliability[13], and cannot be attributed to the learning effect of the test itself. In the course of the strategies related to comprehension, during the execution of the proposed therapeutic program, the patient obtained an increasing positive result throughout the sessions. This finding

Chart 1. Synthesis of the proposed therapeutic program.

Specific objectives	Number of Sessions	Therapeutic Strategies
To understand complex sentences orally	8 sessions	1. Identification of figures related to the sentences presented (matching oral sentence - figure):
		-. Coordinated sentences (sessions 1, 2, 3 and 4): 10 sentences with 2 figures per session (exception, session 4, with 5 sentences);
		- Subordinate substantive sentences (session 5): 10 sentences with 2 figures;
		- Subordinate adjective sentences (session 6): 10 sentences with 2 figures;
		- Adverbial subordinate sentences (sessions 7 and 8): 10 sentences with 2 figures per session.
		2. After hearing 5 subordinate sentences, the patient was asked to answer 5 closed questions about the sentences (session 4).
To understand simple and complex discourse orally	4 sessions	After the therapist read a text, the patient should answer closed questions about the text heard:
		- 1 simple text (5 simple sentences - session 9): 3 closed questions;
		- 1 complex text (6 subordinate sentences - session 11): 4 closed questions;
		- 2 complex texts (5 subordinate sentences - sessions 12 and 13): 4 closed; questions for each text in session 12 and 5 closed questions for each text in session 13.
To produce coherent and cohesive oral narratives	8 sessions	1. From the reading of a text (a report on the plantation theme) by the therapist, the patient should retell it (session 1).
		2. From a logical sequence game (with images), the patient should organize and produce a narrative. (session 2)
		3. From a figure (wedding), the patient should produce a conversation (session 3).
		4. From topics of the participant's knowledge (childhood, pets, rural work routine, professions, living in the institution, preferred foods), she should produce a conversation (sessions 7, 9, 10, 11, 12).
To perform alternating dialogical shifts	3 sessions	1. From a figure (work meeting), produce a conversation with a focus on alternating dialogical shifts (session 4)
		2. Conversation based on two concrete objects and familiar to the participant (picture frame and umbrella, hairbrush and cell phone - sessions 5 and 6).
To produce oral narratives without anomies	2 sessions	Production of oral discourse based on a topic of interest to the participant (food preparation and dairy advertising). In case of difficulties in naming, we provided semantic and phonological cues (sessions 12 and 13)

Table 1. Findings of the assessments carried out from the subtests of oral comprehension and oral narrative discourse, in the pre- and post-speech-language therapy moments.

Subtests	Cut-off score	Pre-therapy scores	Post-therapy scores	Difference before and after therapy
Oral comprehension of words	4,4	4,0	5,0*	1,0
Oral comprehension of sentences	10,1	5,0	12,0*	10,0
Oral comprehension of texts	3,4	2,0	4,0*	2
Oral narrative discourse - words	15,9	15,0	68,0*	53
Oral narrative discourse - scenes	0,2	0,0	0,0	0
Oral narrative discourse - information units	2,5	0,0	4,0*	4

Caption: *Performance above the cut-off score.

Table 2. Findings of the assessments carried out using the Dog Story test, in the pre- and post-speech-language therapy moments.

Components of the Oral Discourse Assessment Index in Patients with AD	Pre-therapy Score	Post-therapy Score	Difference before and after therapy
Lexical alteration	1	2	1
Syntactic complexity	0	1	1
Macroproposition	0	1	1
Cohesive links	1	1	0
Complete propositions related to meaning	0	0	0
Total	2	5	3

reinforces the results obtained in the post-therapy assessment, indicating its effectiveness.

Regarding the oral narrative discourse subtest of the MTL-Brazil Battery, when analyzing the patient's performance, the pre-therapy score was below the cut-off score in all items of the subtest. We can expect a loss of the macro-linguistic dimension of the Discourse in cases of dementia, affecting both aspects of the macrostructure and the microstructure discoursive.[11,12] In the reassessment, we observed a considerable improvement in the patient's performance regarding the number of words and units of information (table 1). The improvement of the microstructure of the speech (number of words) was accompanied by the improvement of one aspect of the macrostructure, the production of a greater number of main information units. Therefore, according to the proposed program, the therapy produced positive changes in the informativeness of the discourse (semantic content). The same was not observed with the processing of the more global content (scenes), since, in this test, we did not observe changes. This fact may be associated with the type of stimulus used to evoke the speech (isolated scene) once we observed an increase in the production of macro-propositions in The Dog Story test (scenes in sequence).

Qualitatively, in the subtest of the MTL-Brazil Battery, the patient also obtained better performance in cohesion in the second assessment when compared to the first one. Although there is no specific measure of this aspect in the subtest used, her discursive production presented more cohesive links.

The results with The Dog Story test corroborated these findings, since the patient obtained a greater number of words produced, more speech time, and a more coherent and cohesive Discourse production, in the post-therapy assessment. This performance was confirmed by the Oral Discourse Assessment Index in AD patients after therapy, with increased scores for the lexical alteration, syntactic complexity, and macro-proposition components (Table 2). It can be observed that there has been improvement in aspects of the macro- and especially the micro-linguistic dimensions of discourse.

When comparing these data with the literature, we observed that semantic, syntactic, and discourse deficits are expected in patients with dementia, since the use of language depends on multiple knowledge which is expressed through semantic, syntactic, and discourse information, compromising all the oral communication, both in emissive and comprehensive aspects[4].

Regarding the production of oral discourse in the therapeutic program, the patient had difficulty in the first session to assimilate the tasks of shift changes, one of the impairments detected during the initial assessment. However, she benefited from the speech-language therapy since she was able to carry out the proposed strategies and achieved progress in this ability. According to Brandão et al.[14], this manifestation would appear only from the moderate to severe level of dementia, reinforcing that the patient benefited from the intervention, considering the mild to moderate phase of dementia.

Considerations about the therapeutic process

The proposed therapeutic program (Chart 1) prioritized the stimulation of discursive skills in all therapy sessions since the literature points out that people with dementia present discourse production as one of the main difficulties in the language[15], as found in the pre-therapy assessment in this study.

Regarding the patient's performance in the proposed therapeutic program, we observed progress with the strategies carried out, despite the patient's complaints regarding complications of her general clinical condition and two hospitalizations during the intervention period, as well as her refusal to undergo therapy, resulting from her behavioral condition.

There were sessions in which the patient remained inflexible about her mistakes, not accepting the therapist's interventions, with changes in mood and behavior, which is expected in patients with dementia[14].

FINAL COMMENTS

As for the discourse level, the patient presented impairments in oral comprehension, as well as oral production, characterized by a reduction in the number of words, information units, and scenes besides deficits in other aspects of the macrostructure and microstructure of the discourse, with loss of coherence and cohesion.

Based on the results obtained through the assessments and the course of the therapeutic process, we can state that the speech-language therapy was effective in the short term for this patient with the linguistic-cognitive disorder and impairments in the discoursive level of language since the data showed positive differences in the pre- and post-speech-language therapy moments, with higher scores after the intervention.

Considering that this is a single case study, it is not possible to generalize such results, and further research is necessary. However, given the scarcity of studies on the effectiveness of speech-language therapy for language stimulation in elderly people with dementia, this study is relevant for contributing to the production of evidence on the effectiveness of speech-language therapy with these patients.

ACKNOWLEDGEMENTS

We thank the participating institution and the participant of this study.

REFERENCES

1. WHO: World Health Organization [Internet]. Dementia: a public health priority. Genebra: World Health Organization; 2012 [cited 2018 nov 30]. Available from: http://apps.who.int/iris/bitstream/10665/75263/1/9789241564458_eng.pdf?ua=1
2. Burlá C, Pessini L, Siqueira JE, Nunes R. Envelhecimento e doença de Alzheimer: reflexões sobre autonomia e o desafio do cuidado. Rev Bioet. 2014;22(1):85-3. http://dx.doi.org/10.1590/S1983-80422014000100010.
3. Rabelo DF. Comprometimento Cognitivo Leve em Idosos: avaliação, fatores associados e possibilidades de intervenção. Kairós. 2009;12(2):65-9.
4. Ortiz KZ, Bertolucci PHF. Alterações de linguagem nas fases iniciais da doença de Alzheimer. Arq Neuropsiquiatr. 2005;63(2):311-7. http://dx.doi.org/10.1590/S0004-282X2005000200020. PMid:16100980.
5. Ávila R, Miotto E. Reabilitação neuropsicológica de déficits de memória em pacientes com demência de Alzheimer. Rev Psiq Clín. 2002;29(4):190-6.
6. Bilton TL, Soares LT, Venites JP, Suzuki HS. Fonoaudiologia em gerontologia. In: Freitas EV, Py L. organization. Tratado de geriatria e gerontologia. 3a ed. Rio de Janeiro: Guanabara Koogan; 2011. p. 1372-81.
7. Mansur LL, Carthery MT, Caramelli P, Nitrini R. Linguagem e cognição na demência de Alzheimer. Psicol Reflex Crit. 2005;8(3):300-7. http://dx.doi.org/10.1590/S0102-79722005000300002.
8. Brucki SMD, Nitrini R, Caramelli P, Bertolucci PHF, Okamoto IH. Sugestões para o uso do mini-exame do estado mental no Brasil. Arq Neuropsiq. 2003;61(3B):777-811. http://dx.doi.org/10.1590/S0004-282X2003000500014. PMid:14595482.
9. Parente MAMP, Fonseca RP, Pagliarin KC, Barreto SS, Soares-Ishigaki ECS, Hubner LC, et al. Coleção MTL-Brasil: Bateria Montreal-Toulouse de avaliação da linguagem. São Paulo: Vetor; 2016.
10. Le Boeuf CR. 55 historiettes en images. Paris: L'Ecole; 1976.
11. Lira JO, Minett TSC, Bertolucci PHF, Ortiz KZ. Evaluation of macrolinguistic aspects of the oral discourse in patients with Alzheimer's disease. Int Psychogeriatr. 2018;31(9):1343-53. http://dx.doi.org/10.1017/S1041610218001758. PMid:30520395.
12. Lira JO, Ortiz KZ, Campanha AC, Bertolucci PHF, Minett TSC. Microlinguitsic aspects of the oral narrative in patients with Alzheimer's disease. Int Psychogeriatr. 2011;23(3):404-12. http://dx.doi.org/10.1017/S1041610210001092. PMid:20699046.
13. Pagliarin KC, Ortiz KZ, Parente MA, Arteche A, Joanette Y, Nespoulous JL, et al. Montreal-Toulouse Language Assessment Battery for aphasia: validity and reliability evidence. NeuroRehabilitation. 2014;34(3):463-71. http://dx.doi.org/10.3233/NRE-141057. PMid:24473247.
14. Brandão L, Parente M, Peña-Casanova J. Estratégias comunicativas de pessoas com Doença de Alzheimer. Psicol Reflex Crit. 2010;23(2):308-16. http://dx.doi.org/10.1590/S0102-79722010000200013.
15. Schlindwein-Zanini R. Demência no idoso: aspectos neuropsicológicos. Rev Neurociênc. 2010;18(2):220-6.

Author contributions

VFM participated in the research planning, performed the data collection, analysis, and interpretation, and wrote the manuscript. TAC supervised the data collection, contributed to the data interpretation, and carried out a critical review of the manuscript. SSB participated in the planning of the research, supervised the data collection, analysis and interpretation and carried out a critical review of the manuscript.