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Ischemic stroke and melodic intonation therapy: a case report

Accidente cerebrovascular isquémico y terapia de entonación melódica: a propósito de un caso

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Abstract

Introduction: Brain alterations in adults bring with them clinical manifestations that compromise the functionality of human beings in different spheres, one of them is language, which can affect understanding and / or expression; this pathology is known as aphasia.

Objective: To determine the effectiveness of TEM in the symptom of agrammatism

Clinical case: A 55-year-old male, with right-handed laterality, with a history of brain damage and presented aphasic symptoms, without prior treatment for their symptoms. oral language difficulties, who undergoes 12 intervention sessions with a frequency of three times a week.

Conclusion: The results reveal an increase in oral production in conversational and descriptive speech in information content, fluency, and sentence length.

Resumen

Introducción: Las alteraciones cerebrales en adultos, traen consigo manifestaciones clínicas que comprometen la funcionalidad en diferentes esferas, una de ellas es el lenguaje, que puede afectar la comprensión y/o expresión; esta patología es conocida como afasia.

Objetivo: Determinar la efectividad de la terapia de entonación melódica en el síntoma del agramatismo

Caso clínico: Sujeto de 55 años de sexo masculino, con lateralidad diestra, con antecedentes de daño cerebral y síntomas afásicos presentados, sin tratamiento previo para sus dificultades del lenguaje oral; a quien se le realizaron 12 sesiones de intervención con una frecuencia de tres veces por semana.

Conclusión: Los resultados revelan un aumento en la producción oral, en el discurso conversacional y descriptivo en el contenido de la información, fluidez y longitud de la frase.

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Introduction

Aphasia is a language impairment that affects the production or comprehension of speech and the ability to read or write. Among its main characteristics, it is found that the etiology is always due to a brain injury; typically, these lesions occur in the dominant hemisphere of language, bringing specific symptoms such as anomia or inability to name any object and poor fluency of oral expression; in turn, all these directly affect the communicative abilities in aphasic patients presenting alterations in mood, behavior, and interpersonal relationships (1). In this sense, there are different diagnoses and stages of aphasia; Broca's aphasia is a language diagnosis resulting from a neurological disorder characterized by a lack of oral fluency, phonemic paraphasias, verbal and written agrammatism, and repetition difficulties. Likewise, the symptom of agrammatism in this type of aphasia is characterized by the production of content words, which have a descriptive meaning (nouns, adjectives, verbs) or short sentences in which functional words are omitted, which have a syntactic function within the word or sentence: articles, prepositions, personal pronouns, and verbal inflections, thus configuring a simplified language, where certain conventional elements of grammar disappear (2). However, comprehension skills are preserved and configured as a nonfluent aphasia.

One of the tools used by speech therapists to rehabilitate nonfluent aphasias is Melodic Intonation Therapy (TEM) since it has positive results in rehabilitating patients with verbal fluency difficulties. TEM has different phases in its application and consists of maintaining the rhythm of oral statements, where the patient tries to reproduce such statements while keeping the intonation and rhythm. As the therapy progresses, the therapist decreases the stimulation, and the patient must reproduce the item independently and with his usual prosody (3). The clinical case aims to test the effectiveness of melodic intonation therapy in the symptom of agrammatism (nominal syntagm), which is composed of an element (noun), which can be accompanied by different determiners (articles), which agree in gender and number. Thus, in his immediate context, the patient increases his oral production and decreases his agrammatical speech, mainly using functional words.

Clinical case

The subject is 55 years old, has previously acquired language, is male, married, a watchman, has a high school education, is right-handed, and has no relevant family history. As the first symptoms presented, the patient reported headaches and loss of consciousness at home. He was seen in the emergency department for presenting inability to move, dyspnea, and fatigue. The symptoms had started five days earlier with the sudden onset of severe headache, confusional state, and slurred speech in the early hours of the morning.

The neurological examination on admission showed temporospatial disorientation, Glasgow scale 11, and motor aphasia. CT of the brain without contrast showed no evidence of old lesions. An acute ischemic cerebrovascular accident (CVA) in evolution was diagnosed.

Currently, she presented Broca's aphasia, not associated with the discrimination of points of articulation, nor with the identification of the meaning of words, as well as severe deficits in alternating and divided attention and difficulty in encoding and storing information. At the sensorimotor level, she presented right hemiparesis with motor impairment of the hand but with independent walking ability.

Finally, this dependent person needed constant support and supervision to perform basic and instrumental activities of daily living. He used a wheelchair to move around. The family reported that the patient presented emotional instability and discouragement that made it impossible for him to participate in family activities. For the participation in this case analysis, the history of brain damage suffered by the patient, the aphasic symptoms presented, and the fact that at the time of the intervention, he did not report a history of previous treatment for his oral language difficulties were considered.

Materials and methods

Evaluation

The language evaluation protocol of the speech therapist Gonzalez (4) was applied considering the following aspects: expressive language, comprehension language, writing, reading, written calculation, visual, copy of a figure, pantomime, and communicative profile. Specifically in expressive language, diminished prosody, long pauses, slow fluency, and articulatory difficulties with word length were evidenced, although he achieves intelligible productions with high-frequency words. In speech, he presented phonemic and semantic paraphasias and agrammatical speech characterized by the omission of articles, connectors, prepositions, and conjunctions.

Two evaluations were carried out, an initial and a final one, which yielded an overall score that allowed the measurement and selection of items related to the symptoms of agrammatism to determine the changes after the melodic intonation therapy (Table 1).

In expressive language, in conversational oral discourse, there was evidence of diminished prosody, long pauses, slow fluency, and articulatory difficulties with word length; in descriptive language, there was evidence of an excessive reduction in oral production, being non-informative, as well as phonemic and semantic paraphasia, ungrammatical speech, omitting articles, connectors, prepositions, and conjunctions. In descriptive writing, there is a total absence of unsupported written words. Finally, the patient presented a communicative profile type II, passive conversationalist, because he does not always respond to conversational topics accurately and does not initiate a conversation.

Melodic intonation therapy sessions

Melodic intonation therapy was applied in I and II levels, except for level III, because it was designed to make the patient's speech return to normal prosody using more complex sentences. Therefore, we did not consider this level; the research was directed

Tabla 1. Resultados de la evaluación inicial

Ítem	Score obtained	Expected score
Expressive language	30	60
Comprehensive language	42	44
Writing	14	99
Reading	18	30
Written calculation	6	12
Visual	15	15
Copy of a figure	4	5
Pantomime	24	24
Communication profile	5	6
TOTAL	174	231

Tabla 2. Resultados de la evaluación final

Ítem	Score obtained	Expected score
Expressive language	44	60
Comprehensive language	44	44
Writing	21	99
Reading	21	30
Written calculation	6	12
Visual	15	15
Copy of a figure	2	5
Pantomime	24	24
Communication profile	5	6
TOTAL	182	231

to the implementation of the therapy with short-long metrical words, high and low frequency, with the use of the nominal syntagm. The time established for the therapy was 12 sessions, three times a week for one month.

Initially, during the application and introduction to the TEM, we worked with 30 stimuli (words) distributed as follows: in the first session (5 stimuli), second session (10 stimuli), and third session (15 stimuli), which included: bed, telephone, television, bathroom, dining room, shower, shoe, cap, pants, kitchen, among others. During the intonation of the words, phonemic paraphasia and semantic perseverations were evidenced in the word telephone/television.

In the fourth, fifth, sixth, and eighth sessions, we worked with ten stimuli in each one, including the nominal syntagm (determiner + noun). Some of the words in-toned were the house, the bed, the shower, the cap, the bath. It is essential to mention that the difficulty is presented for the phonological route entry but not the semantic route.

In the last four sessions, 44 stimuli were presented, distributed as follows: 12 stimuli in the ninth and tenth sessions; 10 stimuli in the eleventh and twelfth sessions, which the patient managed to intonate without difficulty or phonological, semantic or perseveration variations.

Results

During the application of TEM, it was possible to identify that in most of the short metrical and high-frequency syntagms, he did not present difficulties in any of the stages of the therapy levels, and even spontaneously and independently without requiring support. It is important to point out that, during the therapeutic process, the patient showed interest and motivation, and his receptivity provided him with new communicative skills even though the therapy was based on the constant repetition of stimuli, facilitating the achievement of the proposed objectives. In the last four sessions, the patient presented a significant and permanent increase in the score, configuring an important improvement in the symptom of agrammatism.

The patient was re-evaluated when were completed the twelve intervention sessions, finding improvement in fluency, reduction of pauses during the speech, increase in the length of words composed of determiner + noun (nominal syntagm), achieving an improvement in length from one to two words. In turn, she presented a grammatical form with two-word utterances, limited to enunciative and stereotyped, using definite determiners + common and concrete nouns, with an increase in the use of grammatical categories (nominal syntagm) (Table 2).

As the sessions went on and after the introduction of the determiner + noun, the patient was able to progressively comply with the stages and levels of therapy with less difficulty.

In response to the objective of the research, items related to the symptoms of agrammatism contemplated in the initial and final evaluation are retaken. Therefore, conversational speech, descriptive speech, oral fluency, content, and grammatical form are considered expressive language. The score obtained in sentence length is maintained as established in the evaluation protocol; however, it is important to point out that the patient manages to increase the number of words from one to two. Regarding the score obtained for conversational and descriptive speech, there is evidence of an increase in the number of words according to the test scale.

Discussion

Melodic intonation therapy is a tool that allows speech-language pathologists to address language impairment in nonfluent aphasic patients because of brain injury.

According to Haro-Martínez et al. (3), melodic intonation therapy has proven to be feasible and beneficial in earlier stages, within the first months after brain injury; they also report that it has a positive effect on communication skills in patients with nonfluent aphasia. In this case, where there is evidence of communication disorders, specifically in oral production (fluency, sentence length, anomias, agrammatism) and characteristics of expressive language disorders, by sharing the communicative characteristics and the time elapsed after the lesion, we can be said that greater

benefits can be evidenced in terms of oral production in the use of grammatical categories, sentence structuring according to the conversational topic, expanding the possibilities of the effectiveness of the therapy.

Because the therapy focuses on expressive language skills, results have been particularly positive when applied to selected groups of patients (5), specifically those with production limitations, including decreased verbal agility, relatively preserved comprehension, and poor repetition. These characteristics partially coincide because the patient presented decreased oral fluency, sentence length and information content, and auditory comprehension; they increase the factors that predict positive language outcomes.

On the other hand, the study of Melodic Intonation therapy by Van Der Meulen et al. (6), mentions that intensive training in a short period produces an improvement. Thus, the therapy application period in this case was developed in 12 sessions for one month, in agreement with the authors above, who state that the greater the intensity and periodicity, the greater the probability of desertion.

Mattioli (7) indicated that intensive training in the acute stage, in a short period, has significant results in the rehabilitation processes, so the intervention in the patient of study is performed in the initial phase of his brain injury, showing substantial progress in expressive language, mainly in the symptom of agrammatism.

Comments

The evidence of TEM shows feasible results in the acute phase of brain injury; it also registers a positive effect on communication skills in a patient with nonfluent aphasia, specifically in his oral production in using grammatical categories and sentence structuring according to the conversational topic. It is a valuable tool applicable to the most immediate context of the patient. With it, he/she can later access the structuring of a simple sentence, which progressively allows the production of a compound sentence. This, in turn, should be used with a select group of patients who present auditory comprehension skills and difficulties at the level of repetition and verbal fluency, as in the case of Broca's aphasia (8).

In the case of patients diagnosed with Broca's aphasia, the application of TEM is suggested in I and II levels, except for level III (9), due to the difficulty in structuring complex sentences characterized by agrammatism, telegraphic speech, reduced sentence length, and isolated functional categories that do not fulfill a cohesive function, limiting the amount of information.

References

1. Argüello P, Palacios J. Competencia comunicativa y lingüística en la afasia transcortical motora y afasia de Broca. Ciencia Salud. 2015; 3(12): 11-21.

2. Cantillo MG, Rozo AAL, Suárez-Escudero JC. Afasia post acv de acm unilateral por embolia infecciosa en endocarditis bacteriana. Acta Neurol Colomb. 2014; 30(2): 118-123.

3. Haro-Martínez AM, Lubrini G, Madero-Jarabo R, Díez-Tejedor E, Fuentes B. Melodic intonation therapy in post-stroke nonfluent aphasia: a randomized pilot trial. Clinical Rehabilit. 2019; 33(1): 44-53. Doi: 10.1177/0269215518791004.

4. González VRA. Administración y valoración del protocolo de lenguaje para pacientes afásicos. Departamento de Neurología-Neurocirugía, Hospital Clínico de la Universidad de Chile; 2003.

5. Sparks RW, Holland AL.Method: Melodic intonation therapy for aphasia. J Speech Hearing Disorders. 1976; 41(3): 287-297. Doi: 10.1044/jshd.4103.287.

6. Van Der Meulen I, Van De Sandt-Koenderman MWME, Heijenbrok MH, Visch-Brink E, Ribbers GM. Melodic intonation therapy in chronic aphasia: evidence from a pilot randomized controlled trial. Frontiers Human Neuroscience. 2016; 10: 533. Doi: 10.3389/fnhum.2016.00533.

7. Mattioli F. The clinical management and rehabilitation of post stroke aphasia in Italy: evidences from the literature and clinical experience. Neurol Sci. 2019; 40(7): 1329-1334. doi: 10.1007/s10072-019-03844-0.

8. Diouny S. Some aspects of moroccan arabic agrammatism. (1ra. ed.) England: Cambridge scholars; 2010.

9. Helm-Estabrooks N. Manual de la afasia y de la terapia de la afasia. 2. Ed. Buenos Aires; Madrid: Médica Panamericana; 2005.