CASE REPORT

THE JOURNAL OF NEUROBEHAVIORAL SCIENCES
NÖRODAVRANIŞ BİLİMLERİ DERGİSİ

Year : 2015
Volume : 2
Issue Number : 1
Doi Number : 10.5455/JNBS.1422264169

Article history:
Received 26 January 2015
Received in revised form 12 March 2015
Accepted 08 April 2015

MELODIC INTONATION THERAPY IN AN APHASIC PATIENT

AFAZİK BİR OLGUDA MELODİK ENTONASYON TERAPİSİ

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Abstract

Communication deficits resulting from aphasia can negatively impact stroke survivors' social life. It has been reported that patients with severe non-fluent aphasia are better at singing lyrics than speaking the same words. Based on lesion studies, it is generally proposed that the right hemisphere is dominant especially for melody production.

We present a 28-year-old woman with non-fluent aphasia as the result of a left hemisphere ischemic stroke involving mainly the superior division of the middle cerebral artery, and classified as having Broca's aphasia. She was taken into melodic intonation therapy with speech therapy. Singing is accessible and enjoyable for many people with aphasia and melodic intonation therapies may facilitate recovery in such non-fluent aphasic patients.

Keywords: Aphasia, Melodic Intonation Therapy, Speech

Özet

Afaziye bağlı iletişim sorunları strok hastalarının sosyal yaşamlarını olumsuz yönde etkileyebilir. Akıcı olmayan afazi hastalarının söyleyemedikleri kelimeleri şarkı içinde daha rahat söyleyebildikleri bildirilmiştir. Lezyon çalışmalarına göre melodi üretiminde ağırlıklı olarak sağ hemisfer görev alır.

Bu yazıda orta serebral arterin superior bölümüyle ilişkili strok nedeni ile Broca afazisi olarak sınıflanmış akıcı olmayan afazi gelişmiş 28 yaşında kadın hasta sunulacaktır. Olguya konuşma terapisi ile birlikte melodik entonasyon terapisi uygulanmıştır. Şarkı söyleme birçok kişi için kolay yapılabilir ve eğlenceli bir etkinliktir. Akıcı olmayan afazi hastalarında melodik entonasyon terapisi iyileşme sürecini hızlandırabilir.

Anahtar Kelimeler: *Afazi, Melodik Entonasyon Terapisi, Konuşma*

1. Introduction

Aphasia is a disorder that occurs as a result of damage to the dominant an usually left hemisphere caused by reasons such as cerebrovascular disease, brain trauma or degenerative disorders like left variant of frontotemporal dementia. Accordingly, the patient's speech, spoken word comprehension, naming, repetition, reading and writing skills are also commonly damaged. Aphasia adversely affects the social lives of stroke patients due to the communication difficulties. Chronic aphasia studies revealed the important role of Broca's area in various speech and language function. Moreover, functional neuroimaging studies have identified activation of Broca's area with various speech tasks. However, the results of damage to Broca's area can be surprising. For example, if the damage was caused by slow growing brain tumors, speech ability could be maintained, relatively. This case suggests the shift of the functions of the damaged neurons. (Geranmayeh et al., 2014)

Another surprising clinical condition associated with aphasia can be the preserved ability of singing, despite the loss of speech (Albert et al., 1973). Some non-fluent aphasia patients were reported to use some words fluently in a song although they cannot say them during a speech task (Parker et ., 2013). Processing of music in the brain is rather complex issue. Based on the lesion studies in such aphasic patients who can sing fluently, it has been suggested that the right hemisphere is more dominant on the melody production and singing should promote a transfer of language function from left frontotemporal neural networks to their preserved right-hemisphere homologues (Benjamin et al., 2014).

Melodic intonation therapies (MIT) is a therapeutic process with specific protocoles and different styles of singing that supposed to stimulate activation of homologues part right-hemisphere (Benjamin et al., 2014), or reactivation of left-hemisphere due to neuroplasticity (Roy et al,. 2011). Also MIT can be combined with noninvasive brain stimulation to increase effectiveness of treatment (Roy et al,. 2011).

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2. Case

Twenty-eight-year-old, right-handed female patient had a motor vehicle accident that resulted in a widespread neuronal damage due to ischemia. She was treated for 2 months at neurological intensive care unit and was admitted to the outpatient clinics with sequel hemiparesis and severe non-fluent aphasia with restricted expression of words, disturbed naming and repetition, relatively preserved comprehension. She had non-fluent aphasia and right hemiparesis. On the right, Babinski was determined as positive. Mental status examination was normal. She scored 28 on Mini Mental Status Examination. Her complete blood count, biochemistry, and thyroid function tests were found to be normal. The electrocardiogram was normal. Cranial magnetic resonance imaging showed chronic infarct in the left frontal and temporal areas that are supplied by superior division of middle cerebral artery.

Melodic intonation therapy was added to the speech therapy that was begun for motor aphasia. The speech and language therapist observed that, when the melody of a song known by the patient was played, the patient could continue the melody and the lyrics to incorporate fully and without hesitation, except for mild dysarthria. But she could not repeat the words of the song without melody. It was observed that the patient generally failed to initiate the song spontaneous, with the start of the therapist or upon the piano gives the melody, she could attend to the song. Aphasia rehabilitation, as well as melodic intonation therapy was applied to the patient who did not receive any musical education in the past. At the end of seven months follow-up, non-fluent motor aphasia was improved greatly.

3. Discussion

In this case report, a 28-year-old female patient with non-fluent aphasia related to left hemispheric infarct was described. In aphasia patients, the neuropsychologist gets detailed information about the patient at the beginning of speech therapy. The cause of the aphasia and the detailed examination of language would shape the treatment plan. General mental status of the patient, the type of speech disorder, the localization and the pathophysiology of cerebral lesion are important. Based on these data, the neuropsychologist constitutes a rehabilitative training program together with the speech therapist. A similar treatment planning made also for the presented case.

Motor aphasia was observed in this case which has left frontotemporal cerebral damage. Left inferior frontal gyrus plays a major role in the production of speech by various aspects such as phonology, semantics and syntax (Schön et al., 2010). Damage to the left inferior frontal gyrus causes fluent aphasia, without any difficulty in nomenclature, comprehension and repetition. In this case, it is notable that, despite the fluent aphasia, singing skill was preserved.

Music function is a complex event. Although, it is usually considered that left frontotemporal region is the specialized area for speech and right frontotemporal region is important for musical abilities (Callen et al., 2006; Brown et al., 2006), the neuroimaging data indicates that both functions need wide and similar neural plexus (Schön et al., 2010). In the literature, similar to our case, there are cases in which singing skills are protected despite an infarct in left Broca's area (Polat et al., 2013). In the reported cases, left temporal and frontal regions were found to be activated on speech process and right temporal and frontal regions were found to be activated on music process.

The use of different brain regions during language processing and music processing uncovered the melodic intonation therapy that would increase the treatment success of non-fluent aphasia patients. Language and speech therapy plays major role in aphasia rehabilitation. Starting speech rehabilitation immediately after diagnosing aphasia, would increase the success and accelerate the patient's recovery. Singing is an entertaining and easy access event for many aphasic patients and melodic intonation therapy can accelerate recovery in such cases non-fluent aphasic patients.

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