

The women who sang and danced her answers. A patient with advanced Alzheimer's disease: Case report

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Abstract

Introduction: Alzheimer's disease is a disabling disease with very minimal treatment options. Use of neuroleptics reduce their motor abilities and causes early morbidity. There is a serious need for pharmacosparing methods in managing these patients.

Patient and methods: 57 year old lady with advanced Alzheimer's disease was evaluated with HMSE, EASY, and geriatric depression scale in addition to all mandatory work up. She was then rehabilitated with her old familiar music which she sang and danced for nearly 30 years.

Observation: Patient was apathetic, not communicating, sleepy, had a HMSE score of one and CT scan showed left Temporo parietal region more atrophic than right. During evaluation her premorbid interest in music and dance was understood. And we attempted to play her favorite songs and there was a dramatic change noticed, which steadily improved and she even started verbally communicating, dancing and humming the tunes in as short a period as one week. EASY score improved by 3, which means it dropped from 12 to 9 and HMSE improved to 4.

Conclusion: Music can be a very important rehabilitative tool in even advanced dementia patients. It improves mood, behavioral, ADL and apathy. By singing an answer communication improves.

Key message

Our patient had advanced Alzheimer's Disease and dependent for more than one and half years, yet communicating with her through the portal of music produced cheers gross improvement in ADL as well as verbal communication. Therefore, music through alternate pathways might retrieve buried cognitive functions still retained in the patient and can serve as a pharmacosparing rehabilitative tool.

Introduction

Alzheimer's disease is the most common degenerative dementia and disease modifying treatments slow down the neuropsychiatric symptoms if started very early in the course of the disease [1]. It affects 35 million people all over the world [2]. Increasing age and genetic risk factors are important cause for AD [3]. Many disease modifying treatments have been tried with very dissatisfactory results. This is a cause for concern for family as their loved one does not seem to exist anymore. Several rehabilitative tools have been tried with exploitation of preserved skills, neuroprotective agents etc. [4] Music is known to improve neurological functions by inducing plasticity. Music involves listening, learning, singing and thus several functions of nervous system. Listening involves working memory system, auditory cortex and frontal lobe for selective attention, dominant hemisphere for word learning, cerebellum for timing, amygdala and hippocampus are involved in music triggered emotions. According to the French group Stephen Guetin et. al, music acts through several emotional and psychophysiological pathways probably through unique targeted techniques and reduces anxiety depression, and agitation resulting

in significant changes in autonomy, communication and mood [4-8]. Singing or performing music improves social cognition, empathy and communication. Music has been found to improve patients with cognitive impairment by giving them a feel of familiarity with something they understand as it is found that musical ability and aptitude is retained till late in patients, singing is engaging and brings patients out from apathy, it gives emotional and physical sharing feelings at a time due to cognitive deficiencies they are almost locked within themselves and thus improves mood. Anxiolytics and neuroleptics which are commonly used reduce motor functioning and increases morbidity [9]. Study by Gmez showed improvement in as short a period as 4 days. Cognitive functions, neuropsychological functions, mood, aggression, irritability, delusions, memory are all observed to improve [10-13]. FMRI studies have shown that plasticity related changes are seen in brain after music learning in premotor, somatosensory, cerebellar areas as well as inferior temporal regions. This indicates that plastic changes are seen not only in the areas directly involved but also those remotely connected indicating their regenerative potential [14]. In patients with

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Key words: End stage Alzheimer's disease, music for rehabilitation, quick functional recovery

Received: August 22, 2017; **Accepted:** September 20, 2017; **Published:** September 23, 2017

dementia it can be a pharmaco sparing tool for rehabilitation if they have already have the skill in music, in behaviour management and also it may have regenerative potentials as distant regeneration is also seen in FMRI [15].

In ancient Egypt in 6th century BC music was used in the treatment of several neuropsychiatric disorders [16]. David cured King Saul of his depression by playing his lyre. Pain during surgical procedures reduced with the use of music and its effect was analysed in detail by Standley in 1986 [17]. In ancient India, each type of music is designed to create a particular type of vibration which is used for treatment of diseases, to light pyre, bring rain, regulate animals like snake charming, attracting cows with flute and innumerable such purposes carried out without any toxicity to the Universe [18-22].

Music therapy has been tried as active music therapy using sound producing objects and instruments as well as receptive music therapy in the form of listening to music by some researchers [23].

Patient and methods

Patient is a 57 year old female educated up to class ten from Sikkim was admitted with memory problems of 5 years duration. She was a government employee living away from her home as a paying guest with another family. One day she suddenly resigned her job and informed that she was unable to meet the stress at work place. At home her family was surprised that she was no more the same person. She was trying to wash her face with tooth paste, she was moving about like squeezing herself when a lot of space was there and tried to walk out of house through window. She lost interest in cooking and did not know how to cut vegetables, held utensils as if she had never seen them before, did not know how to light the gas and claimed that she forgot as she was a paying guest and she did not have to cook. When she cooked the ingredients were not proper and not cooked properly too. She forgot to serve the food at home to family members, she did not know many of the friends and relatives either by face or by name. She kept asking the same question again and again and forgot important appointments. She was taken to a psychiatrist with the idea it is all related to stress. Later it was found that she was not entering the required data of people in the job she was doing and this was consistently pointed out to her and that made her upset and resign and not increased work stress as she claimed was put on her. Slowly she deteriorated and did not know which place is the kitchen and where is the toilet. She was talking to her own image in the mirror as if it was her friend. She could no more hold a pen; she passed urine and motion in wrong places and forgot to dress herself. Her sleep was increased. She spoke rarely and only few words. She became completely dependent on her husband for all activities of living. She was evaluated with all mandatory work up for dementia including HMSE a 31 point cognitive evaluation tool for Asians, EASY for every day skills and geriatric depression scale. Examination showed a well-nourished person with HMSE score of 1. EASY score was 12 and not amenable for geriatric depression scale and any other neuropsychological tests and MRI. She was not amenable for any neuropsychological evaluation. She was apathetic and was not communicating but did not have any other systemic or neurological illness. Family history revealed that her father died young due to alcoholism and her brother 65 years old is affected by similar illness.

Her husband revealed that she was very good in singing and dancing in family get together before but after her problem became evident to family she had remained isolated and slept most of the time. With this information we requested the husband to sing her most favorite songs which she has sang and danced for more than 30 years.

To our surprise she became very bright and started dancing and sang few words in a discontinuous manner but she could hum the tune very beautifully and correctly but without proper words. she was excited about her discovery of some communication and so were we. (video) We then encouraged her husband to put her favorite songs through ear phone for atleast two hours after break fast and two hours after tea and she was totally cheerful and dancing and to our surprise her verbal communication also improved during the one week stay she had with us. Her HMSE improved to 4 she identified the pen and watch and registered two words. Her EASY score dropped 9. she was cooperative for eating and dressing. We encouraged the husband to make her sing answers. She could greet us, Hum some tune for us, and at the time of discharge could tell us in her mother tongue she will come after 6 months. Detailed neuropsychological evaluations could not be done as her scores in HMSE was only 1 on admission.

Investigations

Her investigations including thyroid function, HIV, VDRL and renal, hepatic functions were all normal. Her B12 was 208 lower limit of normal. She had mirror image agnosia. She could not read or write or draw and not amenable for any tests of neuropsychological function. But could point to 4 body parts. Her old MRI done one year ago showed bilateral temporoparietal atrophy left more than right. She could undergo only CT scan at our center which also showed asymmetrical dilatation of ventricle, left more than right with significant atrophy on the left temporo parietal region. (Figure1)

Discussion

Our patient had asymmetrical brain atrophy left more than right which probably affected her verbal communication resulting in severe apathy. Music as a instrument of communication was not attempted by family in view of her very poor social cognition. But music is the last to be lost in patients with dementia and therefore can be used to evoke emotions that bring back memories. It improves patients socializing ability and thus motor, cognitive and affective functions favorably. Music has affective, social, cognitive effects and improves autobiographical memory, smile, limb beating to rhythm initiated serves as a communication mode, improves selfworth by enhancing nonverbal communication and above all by using a wide area of networking including mirror neurons improves bi hemispheric functions [24-26]. Music therapy can significantly contribute to functional and cognitive rehabilitation and maintenance of pre existing functions control behavioural problems and improve positively social



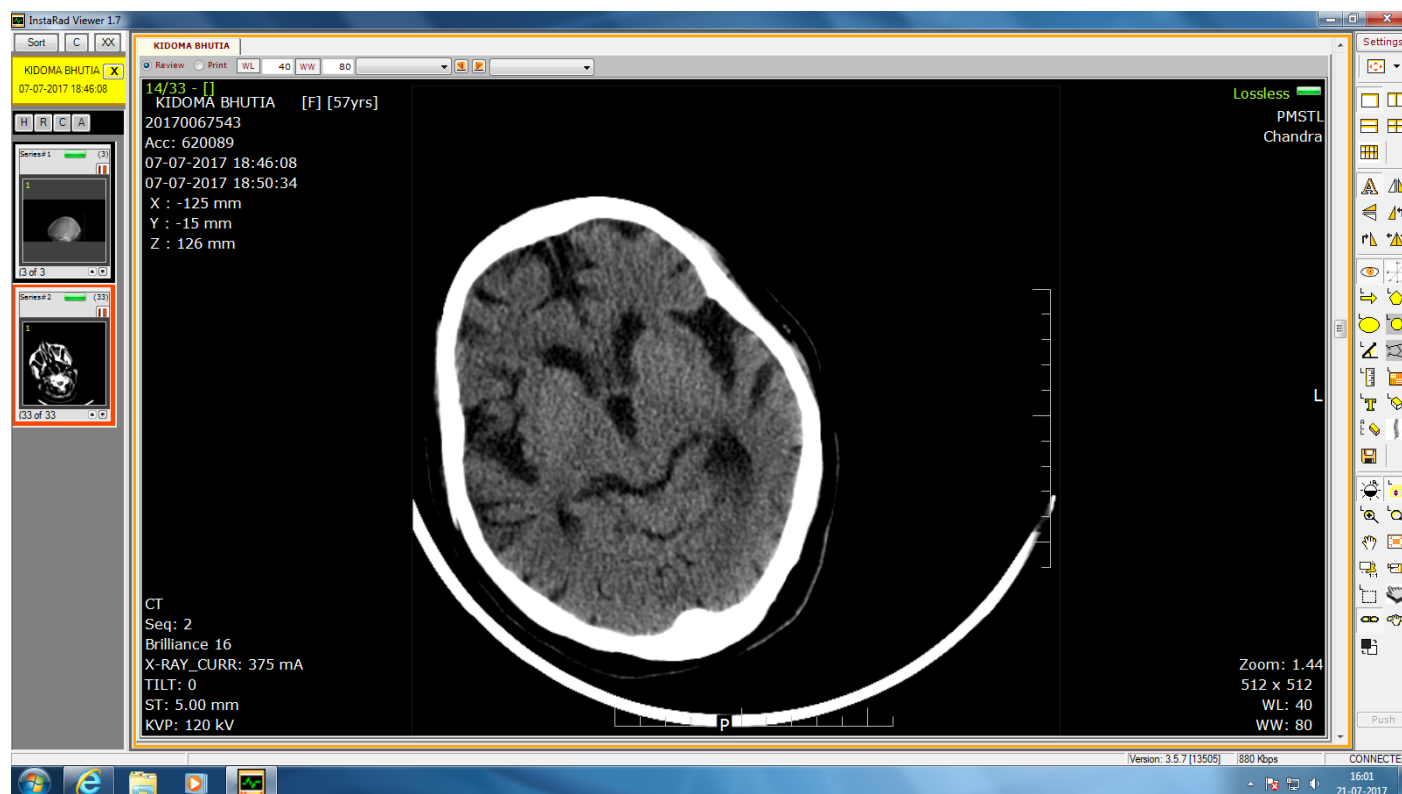


Figure 1. CT scan at our center which also showed asymmetrical dilatation of ventricle, left more than right with significant atrophy on the left temporo parietal region

skills. Music serves as individual patient centered therapeutic tool capable of producing meaningful effects in patients who have personal knowledge of music.

Conclusions

This patient is a case of advanced Alzheimer's disease with total dependence for all ADL. But on knowing that she had previously had musical and dancing skills, we tried to stimulate her with her favorite songs and it was surprising that not only she became a totally different cheerful person singing tunes mostly and words in between but with in a short span of one week she also started talking few words though in musical prosody. Therefore it appears that learning music in childhood apart from the benefits in social cognition also can be used as an effective rehabilitative tool training them to sing their answers and though our patient is a single case it appears as a remarkable tool. This again highlights the need for revoking the traditional methods such as teaching music to every child.

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