

Raga Therapy in Neurocognitive Disorders

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Abstract

The world is heading towards non pharmacological aspects for healing various ailments and the recent upcoming topic is on "Heal through Ragas". Many literatures both ancient and modern, though speak extravagantly of its benefits, its utility for practical purpose is lacking. Such music is composed of ragas and each raga ought to be played in a particular time of the day. There is substantial amount of research been conducted on the effectiveness of music for alleviating neurocognitive disorders. Hence, in dearth of promising pharmacological treatment for various neuro degenerative cognitive disorders, raga therapy as non-pharmacological therapy in practical world can lead to promising outcome.

Keywords: Raga; Music; Dementia; Neurocognitive Disorders; Therapy

Introduction

Music has been an ancient part of Ayurveda. Music in India dates back thousands of years to the Gandharva Veda [1]. Great composers of Indian classical music have attempted music therapy for many years. Indian classical music Thyagaraja, a Carnatic music maestro, composer, and vocalist, brought a dead person back to life with his composition [2]. Pythagoras, Aristotle, and Plato were among the first philosophers to consider the healing and transformative power of music [3]. In 1877 through phonograph, doctors were able to use music as sedative or distraction in the operating room [4]. Our ancient healing method like Ayurveda suggests music therapy as one of the healing methods. Music therapy advocates that different sound (naad) creates some vibrations in space which lead to many different healing effects in the human body. The sharirik doshas i.e. vata, pitta & kapha and mansik doshas i.e. raja & tama are balanced by raga chikitsa by primarily acting on mansik doshas [1].

A piece of music is constituted of intonation and the correct application of fundamental elements such as nada (sound), shruti (musical interval), swara (note), raga (melody), tala (beat), and laya (rhythm) [5]. The seven notes or swaras of the saptak or scale are Sa, Re, Ga, Ma, Pa, Dha, and Ni. The very first note, "Sa" (Shadja), is derived from a peacock's voice; "Re" (Rishabh) is derived from the sounds produced by a cow when separated from her calf; "Ga" (Gandhar) is derived from a flock of goats bleating; and "Ma" (Madhyam) is derived from a heron's call. The note "Pa" (Pancham) was inspired by the spring call of the cuckoo bird, and "Dha" (Dhaivat) by the neighing of a horse. Each note or swara that is lowered or raised in pitch is known as komal (flat note) or teevra (sharp note). Shadja (Sa) and Panchama (Pa) are two steady or natural notes, having no distortion or displacement. Rishabha (Re), Gandhara (Ga), Madhyama (Ma), Dhaivata (Dha), and Nishada (Ni) are accepted as having two forms, as stated above, namely, one high and one low. We have a total of 12 notes [6].

In Ayurveda, the timing of the day is divided in relation to each of the doshas (the governing principles of the mind and body). The 'dosha clock' is divided into six four-hour periods: Vata periods are 2 a.m. - 6 a.m. and 2 p.m. - 6 p.m.; Pitta periods are 10 a.m. - 2 p.m. and 10 p.m. - 2 a.m.; Kapha periods are 6 a.m. - 10 a.m. and 6 p.m. - 10 p.m. [7]. Raga music, the melodic structure of traditional Indian classical music, has been used for centuries to heal both physical and mental illnesses. Recent studies have suggested that this form of music can be particularly effective in treating cognitive disorders such as Alzheimer's disease, dementia, and autism. A raga is a three-hour musical piece that is said to express a specific vibration of nature [8]. Listening to the right raga at the right time is said to smooth natural transitions and acclimating the body and mind to the 24-hour cycle. Additionally, specific ragas are prescribed to balance specific doshas. Although the literature on ragas and their effects on various neuropsychological disorders is limited, we attempt to provide a brief overview of it here.

Neurocognitive Disorder/Dementia

The term comes from the Latin noun "Cognito" ('examination,' 'learning,' or 'knowledge'), derived from the verb "cognosco", a compound of con ('with') and gnosco ('know') [9]. The DSM-5 defines six key domains of cognitive function: complex attention, executive function, learning and memory, language, perceptual-motor control, and social cognition [10]. The DSM-5 diagnosis of Major Neurocognitive Disorder, which corresponds to dementia, requires substantial impairment to be present in one or (usually) more cognitive domains. The impairment must be sufficient to interfere with independence in everyday activities. The diagnosis of Mild Neurocognitive Disorder, corresponding to MCI, is made when there is modest impairment in one or more cognitive domains [11].

Pharmacological interventions so far have had limited effect on alleviating various symptoms of dementia. Hence, the world and multiple researchers are also assessing different non-pharmacological aspects for alleviating symptoms of dementia. One of such therapies is use of music for healing. Dementia is a neurodegenerative disorder where neurons responsible for cognition either die off or decrease in their functional activity. Studies have revealed that music can decrease neuronal degeneration by enhancing cerebral plasticity and even induce the creation of new connections in the brain [12]. The three possible mechanisms explained for cognitive enhancement through music are: increasing global efficiency through the purging of irrelevant neural networks, especially between long-distance inter-electrode connections; increasing local neural efficiency at the prefrontal lobe; and enhancing sustained attention [13]. Imaging studies showed music therapy increased functional

activity in the frontal, hippocampal, and cerebellar regions of the brain by up to 34% compared to control [14]. All the above-mentioned regions play a very vital role in cognition. The frontal lobe is involved in executive function, attention, decision-making, problem solving, thought, attention, and social cognition [15]. The hippocampal region is the site for episodic memory and new learning [16] and the cerebellum in executive function as well as in visuospatial, memory, and language due to its rich connections through the thalamus with the dorsolateral prefrontal cortex, the medial frontal cortex, the parietal and superior temporal areas, the anterior cingulate, and the posterior hypothalamus [17]. Music can also activate subcortical circuits, the limbic system, and the emotional reward system, provoking sensations of welfare and pleasure [18].

Ragas are believed to be effective in treating a wide range of neurocognitive disorders and symptoms since ages. Individual Ragas with their influence on various cognitive aspects studied so far are as follows-

- Raga Darbari Kanhada- when played for 10 minutes before sleep, has been shown to help people suffering from depression, anxiety, stress, and sleeping disorders in the elderly [19,20].
- Raga Bhupali- played during late evening between 7pm to 9 pm has an immediate effect on attention and concentration in young individuals [21].
- Raga Shankarabharanam and Kalyanavasantam, when played twice a day for a month, may help in alleviating depression [22]. These ragas are also described as decreasing the symptoms of Alzheimer's disease [23].
- Raga Bihag, Bahar, Kafi and kamaj- played at night between 9 pm to 12.00 pm for Insomnia [20].
- Raga Bhipalasi- was played to increase concentration in day to day activities between 3 p.m. and 7 p.m. [24].
- Raga Yaman Kalyan, played between 6 p.m. and 9 p.m., relieves stress and anxiety [6].
- Raga Bairagi- played between 6am to 9am helps to increase memory [6]. This raga is said to be introduced by Pt. Ravi Shankar.
- Raga Bhairavi- played in early morning strengthen emotions [6].
- Recent studies have suggested different ways by which Raga music may be helpful in neuro-cognitive disorders.

First, Raga music has been shown to reduce stress levels, which can lead to improved cognitive function in patients with cognitive disorders. Studies showed that people who listened to 30 minutes of raga music experienced significant decreases in anxiety, stress levels, and fatigue compared to those who did not listen to raga music. This demonstrates that Raga music can positively affect the physical symptoms of cognitive disorders such as anxiety and depression [25,26]. Furthermore, Raga music can also improve mental

clarity and focus for individuals suffering from cognitive impairments. Studies have demonstrated that listening to 45 minutes of raga music daily can significantly improve short-term memory in elderly adults with dementia. This shows that listening to Raga music could potentially help alleviate some of the cognitive deficits associated with dementia and other cognitive disorders [27].

During the medieval period, Indian classical music was generally practised in two traditions, the Carnatic music prevalent in South India and the Hindustani classical music in North India. The major difference between the two forms are- 'Carnatic Music' gives more importance to Vocal than Instruments and 'Hindustani Music' gives more importance to Instruments than Vocal [28]. One study compared among two forms of Indian classical music- North Indian Raga music and Carnatic and its combination in utility for cognitive deficits. Participants who listened to two different types of Indian classical music (North Indian Raga music or Carnatic) had significant improvements in verbal memory when compared to those who did not listen to either type of music. In addition, those listening to Carnatic had greater improvements than those listening to North Indian Raga Music suggesting that Carnatic might be better suited for individuals with cognitive deficits [29]. A growing body of research has shown that raga music can improve attention and concentration levels in people with dementia or Alzheimer's. This type of music also seems to reduce agitation and improve sleep quality in patients suffering from these conditions. Music therapy sessions that incorporate raga melodies have been seen to enhance short-term memory in elderly people who suffer from cognitive impairment, making it easier for them to recall things such as their names or date [30]. Furthermore, many caregivers have found that exposure to this type of soothing and repetitive music helps those with Alzheimer's or dementia stay calmer and more peaceful [23].

In addition, research suggests that Raga music can provide relief from physical pain due to its calming nature and ability to reduce stress levels. One study found that participants reported decreased levels of both physical and psychological distress after listening to 30 minutes of raga music daily for two weeks [31]. The soothing sounds of raga melodies could be particularly helpful for individuals suffering from chronic pain or mental health conditions like depression. Finally, it appears that Raga music may even be able to influence brainwaves in order to bring about deeper states of relaxation. Researchers discovered that EEG activity changed significantly during a study session when subjects were exposed to 45 minutes of raga music daily for three weeks, indicating increased states of relaxation [32,33]. This further proves how beneficial listening to Raga music can be for people with cognitive impairments secondary to various medical conditions which require stress relief or improved

mental clarity and focus.

Raga music is also known for its ability to help children on the autism spectrum express their feelings more easily. Children with autism often experience difficulty when it comes to verbal communication, but raga melodies may provide a bridge between their inner emotions and outer expression [34]. A recent study has suggested that exposure to specific types of Indian classical music increases alpha waves in the brains of children on the autism spectrum, resulting in an improved state of calmness and relaxation which helps facilitate further social interaction with peers [35]. Other studies have suggested that autistic individuals experience an increase in relaxation when exposed to raga music, leading to increased social functioning [36-38]. Similarly, research has found that individuals with depression demonstrate improved sleep quality after being exposed to calming ragas while they are awake during the day or before going to bed at night. Furthermore, it has been observed that playing Hindustani raga-based music can reduce symptoms of depression and help improve emotional regulation among patients suffering from depression [39].

All these benefits demonstrate the potential role of raga music in providing relief for those suffering from cognitive disorders. Through its unique combination of rhythm and melody, this ancient art form can bring emotional solace, reducing feelings of stress, anxiety, and depression. The next step is for researchers to continue exploring how raga can play a part in modern-day treatments for neurological conditions. The therapeutic benefits of raga music are related to its complexity and beauty. Raga music often contains improvisational aspects that allow greater flexibility in addressing specific patient needs. The scales of raga melodies also encourage relaxation. Additionally, the soothing nature of raga melodies helps calm both body and mind while providing mental clarity and stability. Overall, there is preliminary evidence that listening to Raga music may offer a range of benefits for people suffering from cognitive disorders or other medical conditions which require stress relief or improved mental clarity and focus. While more research is needed into the precise effects of Raga music on various ailments, existing studies demonstrate potential positive effects which should be taken seriously by medical professionals as an alternative treatment option for patients experiencing physical or psychological distress due to medical conditions such as dementia or depression. The research on the effects of raga music on cognitive disorders is promising and indicates potential therapeutic benefits associated with this type of ancient healing tradition. Raga music has been shown to have beneficial effects on both mental and physical health due to its complex nature and soothing qualities. Future research should focus on understanding the nuances of individual ragas in order to gain more insight into their

therapeutic effects so practitioners can make more informed decisions about their use for treating various cognitive conditions.

Conclusion

Though the use of ragas and music to treat various ailments has been documented in various scriptures throughout the ages, its practical application has lagged. Being less invasive and proven to be effective from time immemorial at a deeply individual level, it can be a breakthrough for the management of various cognitive disorders. Hence, more and more adequate standard design protocols for scientific research are required based on the nature or stage of dementia to establish its therapeutic dimension and application to different cognitive impairment parameters in the modern world.

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