Original Research Article

Raga based music therapy amongst prediabetic: An analysis by HAM- A clinical anxiety scale

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A B S T R A C T

Introduction: The phenomenal change is seen in the arena of music therapy; as it is evident that music therapy which was observation and experience based in the past; now became evidence based. In India it is popularly known as Raga Chikitsa. The present study was intended to determine efficacy of music therapy using raga-based Bollywood songs amongst prediabetic.

Materials and Methods: The Hamilton Anxiety Scale (HAM-A) was used to quantify the severity of anxiety symptomatology. Thirty prediabetic were included in the study were subjected to music therapy session for 20 minutes using raga-based Bollywood songs from Hansdhwani, Yaman, Darbari etc. The blood pressure, blood sugar and HAM A clinical Anxiety Scale score was noted down before and after the session.

Result and Analysis: The post therapy fall in the blood sugar (t =6.14, P < 0.05) and systolic blood pressure (t = 5.12, P < 0.05) was statistically significant. The change in the diastolic blood pressure (t = 3.39, P > 0.05) was insignificant. There was decrease in the CAS score post therapy when analyzed by t test the difference was significant (t= 3.83, P < 0.05) for entire prediabetic group.

Discussion: Musical stimuli activate specific pathways in several brain areas associated with emotional behaviors, The biochemical mediators, such as endorphins, endocannabinoids, dopamine, and nitric oxide are modulator of stress response, Music therapy restore the balance between sympathetic and parasympathetic nervous system and combat stress.

Conclusion: It can be concluded that raga-based Bollywood songs are stressbuster for prediabetic. We recommend use of music therapy as adjunct modality for the management amongst prediabetic with no or mild symptoms of anxiety.

1. Introduction

1.1. Prediabetes

Prediabetes is the buffer zone between normal and diabetic state, right measures may prevent full blown diabetes. Lifestyle intervention like yoga, exercise and music therapy may modify the prognosis of disease.[1] Development of awareness for lifestyle modification and quantification of efficacy of different modalities is the need of the hour.

Stress is a potential contributor to chronic hyperglycemia in prediabetes. Stress stimulates the release of various hormones, which can result in elevated blood glucose levels. American Association for Music Therapy recognized the beneficial effects of Music as an art therapy to manage stress. Subjective anxiety reduced in normal healthy men and women after listening to relaxing music. Music listening has been suggested to beneficially impact health via stress-reducing effects.[2]

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1.2. Raga Chikitsa

The Raga Chikitsa dates back its origin to Vedic period, especially Rig Vedic Period. The vedic hymns of the vedic period were meant for yajnas and were called Yajur. Vedas and the hymns meant for singing were called Samaveda. Music was evolved out of stanzas of Rig Veda set to tunes and tones in the form of samogonkas, cultured with a religious motive and a spiritual purpose. After the Vedic music, Gandharva or Marga music evolved, and then the formalized regional or Desi music which enriched the treasury of Indian classical music in the form of ragas and gitis. In Indian subcontinent Raga Chikitsa is one of the effective nonpharmacological measures to combat the stress. [3]

1.3. Bollywood music… The elixir: Need to quantify

Many psychologists, musicologist studied extensively on therapeutic effect of the Raga like Hansdhwani, Bageshree, Puria Dhaneshri, Yaman, Darbari, Shudh Kalyan etc. The therapeutic effect of different Ragas has been widely studied. In the Indian society those have liking for the music will go for listening to notation of pure raga; but a common man more commonly listens to Bollywood music. These are mostly heard through radio previously, through aakashwani, vividhbharti. Binaca Geetmala being one of the most popular all-time favorite program. Now through different apps and podcast people are still relaxing themselves through music.

Measurement of stress has been a major challenge to scientist and researchers. Over the past two decades several psychological tools have been used to document the perception of stress by the individual. [4] The HAM-A was one of the first rating scales developed to measure the severity of anxiety symptoms and is still widely used today in both clinical and research settings. [5]

To bridge the gap and to know more about the therapeutic effect of Bollywood songs based on specific Raga needs to be quantified. The present study was intended to determine efficacy of music therapy using raga-based Bollywood songs amongst prediabetic.

2. Methodology

The present study was carried out in Department of Physiology attending Music Therapy Clinic. Recording for each participant was done in the morning hours between 9.00 A.M and 11.00 A.M. The participants were instructed to avoid tea, coffee intake and strenuous physical exercise at least 2 hours prior to the test. Each participant reported to the Music therapy clinic after a light breakfast. Those having fasting blood sugar between 100 to 125 or glycosylated hemoglobin of between 5.7% and 6.4% were included as prediabetics. In the clinic, after preliminary briefing, the participant was asked to lie down in the supine position

and breathe in a relaxed manner, without going off to sleep. After a 10 min rest, through semi structured interview demographic information was collected. The Hamilton Anxiety Scale (HAM-A) [5] is a rating scale developed to quantify the severity of anxiety symptomatology. It consists of 14 items, each defined by a series of symptoms. Each item is rated on a 5-point scale, ranging from 0 (not present) to 4 (severe). Hamilton A Clinical Anxiety Scale (CAS) score was used to assess the level of anxiety. The CAS score was calculated and noted. Vital parameters like temperature pulse respiration blood pressure and blood sugar were recorded before the session. The subjects were given 20-minute session of music therapy using popular Indian Bollywood Songs of specific raga like Hansdhwani, Yaman Puria Dhaneshree, Darbari, Bageshree, and Shudh Kalyan. After the session vital parameters and CAS score were recorded once again post therapy. The HAM A Clinical Anxiety Scale score was calculated by summing the scores from all 14 parameter. When the score less than 14 was termed as normal, those between 14 to 17 were termed as mild anxiety. Between 18 to 24 were termed as moderately anxious and those having score more than 25 were included in the severe anxiety.

3. Result and Analysis

After collecting the data for heart rate, blood pressure, blood sugar and Clinical Anxiety Scale Score, it was subjected to statistical analysis using statistical software. Out of thirty prediabetic there were 11 males and 19 female patients. The average age of subject was 42 years for male and 38 years amongst female.

The comparison of blood sugar amongst prediabetics before (133.23 ± 6.39) and after (126.6 ± 5.93) the music therapy exhibited decrease in the blood sugar after music therapy session with the standard error of 1.16 and 1.08 for before and after music therapy session respectively. Analysis by t test revealed that the difference was significant. With t value 6.14 and $P < 0.05$. The details are depicted in Table 1.

It was observed that there was decrease in the systolic blood pressure after the session of music therapy the decrease in the systolic blood pressure was statistically significant when analyzed by t test ($t = 5.12, P < 0.05$). It was 131.93 ± 5.15 before which became 128.63 ± 6.09 after the session of music therapy. The details are depicted in Table 1.

Regarding diastolic blood pressure it was observed that there was fall in diastolic blood pressure too. But analysis by t test ($t = 3.39, P > 0.05$) did not reveal statistically significant difference. It was 86 ± 5.15 before which became 85 ± 6.09 after the session of music therapy. The details are depicted in Table 1.

As per HAM A scoring pattern, out of thirty subjects ten (N =10, 03 M, F =07) exhibited CAS score less than 14 with no anxiety. Fourteen were having CAS score between

Table 1: Showing details of the parameters before and after music therapy

Parameter	Before MT	After MT	t value	p value
Blood Sugar	133.23 ± 6.39	126.6 ± 5.93	6.14	P < 0.05
Systolic Blood Pressure	131.93 ± 5.15	128.63 ± 6.09	5.12	P < 0.05
Diastolic Blood pressure	86 ± 5.15	85 ± 6.09	3.39	P > 0.05
HAM A Clinical Anxiety Scale (CAS) score	15.06± 0.52	14.33 ± 0.64	3.83,	P < 0.05

14 to 17 were termed as mildly anxious (N =14, M= 08 F =06). There were six subjects in the moderately anxious category (N=06) and all of them were females. There was no severely anxious patient. The mean score of the CAS amongst no anxiety group was 12 which became 10.8 after the session. In the mild anxiety group the CAS score before 15.35 reduced to 14.28 after the session. The mean score of moderate anxiety was 19.35 which became 20.33 after the session. We observed decrease in the CAS score post therapy in normal and mildly anxious subjects. The statistical analysis by t test revealed significant (t= 3.83, P < 0.05) difference of CAS score when compared before 15.06± 0.52 and 14.33 ± 0.64 after the session of music therapy for entire prediabetic group.

4. Discussion

Stressful life, sedentary lifestyle, lack of exercise, eating habits, dietary factors and environmental factors are some of the major reasons for rising trend of the diabetes worldwide. Stress management through lifestyle modification has become integral part of the preventive measures adopted in the battle against diabetes. Music therapy restore the balance between sympathetic and parasympathetic nervous system.

Ancient Greek philosopher, Plato (428-347 BC), quoted "music gives wings to mind". Plato considered that music played in different modes would arouse different emotions.[6] This much ancient is the association be- tween music and mind. "Raga" is described as "a particular arrangement of sounds in which notes, and melodic movements appear like ornaments to enchant mind.[4] On the other hand, "rasa" is described as "the psychological reaction or the reverberation occurring in persons in response to listening music." It is assumed to represent both "primary and responding" emotions.[7]

Musical stimuli have been shown to activate specific pathways in several brain areas associated with emotional behaviors, such as the insular and cingulate cortex, hypothalamus, hippocampus, amygdala, and prefrontal cortex. In addition, neurochemical studies have suggested that several biochemical mediators, such as endorphins, endocannabinoids, dopamine, and nitric oxide, may play a role in the musical experience.[8]

The fall in CAS Score observed in our study may be attributed to modulation in the sympathetic drive. Similar results of modulation of sympathetic drive post therapy were also observed by Trevor et al.[9]

Nada Yoga and Raga Chikitsa form the backbone of ancient system of music therapy[10] Music therapy can be useful both in depression[11] and anxiety.[12]

5. Conclusion

It can be concluded from the present study that raga-based Bollywood songs can be used as one of the nonpharmacological measures in the management of prediabetic. The present study was limited to assessment of CAS Score. Estimation of cortisol level and its correlation with CAS score are part of our upcoming studies. Also, it is evident from the data that music therapy is more useful to reduce the anxiety amongst normal and mild level of the anxiety. In case of moderate level pharmacological management will be more relevant. We acknowledge the contribution by clinical department, there was no conflict of interest. We recommend use of music therapy as adjunct modality for the management amongst prediabetic with normal or mild symptoms of anxiety.

6. Source of Funding

None.

7. Conflict of Interest

None.

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