

Acute Effect of Tibetan Meditational Music on Autonomic Functions

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Abstract: Tibetan music has been in use for the meditational purpose by people residing in Himalayan region since long time. Regularly listening of this music causes perceptual relief from day to day stress in them. The objective of this study was to evaluate the acute effect of Tibetan meditational music therapy on the Autonomic functions. Two apparently healthy, health care workers, both belonging to the northern Gangetic plains of India, were selected for this study. They were allowed to rest in a sound proof room for 15-20 minutes and were given a session of 30 minutes of Tibetan meditational music therapy. Pre- and post-music therapy recording of autonomic functions were performed by short-term heart rate variability (HRV) test. Pre-musical therapy recording of heart rate responses to sudden standing (30:15 ratio), Deep Breathing (E:I ratio), valsalva manoeuvre (phase IV:II ratio) and blood pressure response to sustained hand grip were also done to correlate with the baseline findings of HRV. After 30 minutes of Tibetan musical therapy, the short term-HRV parameters were shifted towards parasympathetic dominance and suppression of sympathetic activity as shown by significant rise in HF and reduced LF and LF/HF ratio in both the participants. Tibetan meditational music therapy has relaxing effect on autonomic nervous system, thus its use as a method of relaxation for day to day stress.

Keywords: Tibetan music, valsalva manoeuvre, relaxing effect, meditational music therapy.

INTRODUCTION

Music is a powerful stimulus for evoking and modulating emotions as well as moods [1]. The effects of music have been well known for thousands of years. Throughout human history, music has played an important role in the 'making of health' by its use in rituals and religious services. In recent years, different types of music have been increasingly used as a therapeutic tool in the treatment of different diseases. The studies on relaxing music have determined a close relationship between music and health, and its use as an adjunct treatment method [2, 3]. However, the physiological basis of music therapy is not well understood as the effectiveness of music is governed by individual mood and preferences. The effect of music also correlates with music profiles including tone, frequency and tempo, musical training or practice. Music can elicit both exciting and relaxing effects at the same time, involving both autonomic and endocrine activity, making it challenging to pin down physiological effects of music to specific emotional processes [4, 5].

Music is associated with activity changes in brain structures involved in regulation of mood and

emotions like the hypothalamus, amygdala, insular cortex, and orbitofrontal cortex [6]. These structures are known to modulate activity of various physiological systems also via Autonomic nervous system (ANS) [7]. Generally, emotional arousal is associated with a predominance of sympathetic ANS activity, thus leading to an increase in heart rate (HR), whereas a relaxation is associated with predominance of parasympathetic ANS activity leads to a decrease of HR [8].

Tibetan music has been in use since long time, for the meditational purpose by people residing in Himalayan region. This practice is very much prevalent by the people residing in Tibetan-Himalayan region. Regularly listening of this music causes perceptual relief from day to day stress as well as long term ill-effects related to chronic mental stress. It has been proposed that, this particular type of music can be used as stress-buster for health care workers, in-hospital patients and the relatives of patients, if it is used effectively.

In this case study, the attempt has been done to evaluate the acute effect of Tibetan meditational music therapy on the Autonomic functions, particularly

short term Heart rate variability (HRV) of adult people of plain areas. So that, in future the research could be conducted with larger sample size & further this simple but effective mode of relaxation could be used as a therapeutic mean for the purpose of stress relief and as an adjunct therapy for many psychosomatic and psychiatric disorders.

MATERIALS & METHODS

Two apparently healthy, health care workers, all belonging to the northern Gangetic plains of India, were randomly selected for this study. They were allowed to rest in a sound proof room for 15-20 minutes and then they were given a session of 30 minutes of Tibetan meditational music therapy with the help of a headphone. Pre- and post-musical therapy

recording of autonomic functions were performed by short-term HRV test.

Pre-musical therapy recording of heart rate responses to sudden standing (30:15 ratio), Deep Breathing (E:I ratio) and valsalva manoeuvre (phase IV:II ratio) as well as the blood pressure response to sustained hand grip were also done to correlate with the baseline findings of HRV and to know the dominance pattern of a particular segment of autonomic function, either sympathetic or parasympathetic. Results are discussed here case by case and summarized later on.

RESULTS

Table-1: Descriptive demographic characteristics

Parameters	Case 1	Case 2
Age	42 year	36 year
Gender	Male	Female
Height	165 cm	148 cm
Weight	56 kg	50 kg
Body mass Index	20.6	22.8
Waist circumference	84 cm	82 cm
Hip circumference	86 cm	95 cm
Waist: Hip Ratio	0.96	0.863

Table-2: Baseline cardiovascular function and autonomic reactivity test:

Parameters	Case 1	Case 2
HR(bpm)	64	68
SBP (mmHg)	110	100
DBP (mmHg)	70	72
30:15 ratio	1.064	1.11
E: I ratio	1.34	1.34
Valsalva (IV:II) ratio	1.25	1.32
Rise in DBP in response to sustained hand grip (mmHg)	30	20

Table-3: Pre- and Post-music therapy Short term Heart rate variability (frequency domain)

Parameters	Case 1	Case 2	
VLF (%)	Pre-music	45.41	24.03
	Post-music	48.55	9.369
LF (%)	Pre-music	43.15	29.34
	Post-music	21.35	15.3
HF (%)	Pre-music	11.23	46.32
	Post-music	29.94	72.55
LF/HF	Pre-music	3.842	0.6334
	Post-music	0.7131	0.2109
Total Power (ms ²)	Pre-music	875.7	6424
	Post-music	401.1	3480

DISCUSSION

The high frequency (HF, 0.15-0.4 Hz) power shows a peak centred at the respiratory frequency and predominantly reflects efferent vagal influences on HRV. Low frequency (LF, 0.04-0.15 Hz) power is modulated by baroreflexes with a combination of both the sympathetic and parasympathetic systems. Studies

have demonstrated an increased LF power with increasing sympathetic activity whereby the ratio between LF and HF considered reflecting sympathovagal balance [9].

After 30 minutes of Tibetan musical therapy, the short term-HRV parameters were shifted towards

parasympathetic dominance and suppression of sympathetic activity as shown by significant rise in HF and reduced LF and LF/HF ratio in both participants. These results show the relaxing nature of this particular type of music for them. Meditation music has soothing as well as sedative effects. Sounds used in the musical therapy were slow and also rhythms were few. This kind of music generates spiritual reflection also.

McCraty *et al.*, also supported that relaxation therapies causes positive emotions which augment HF component of power spectrum [10]. By use of relaxing music, parasympathetic activity increases which further leads to decrease in HR and HRV [11]. The current case study also supports the increase in HF and decrease in LF after session of Tibetan meditational music.

It is essential to note that this music has beneficial effects on different physiological parameters and will become an important option when treating patients. These effects of Tibetan meditational music can be used in different health care settings like in intensive care medicine, in geriatrics and in patients with neurological diseases or depressive syndromes.

CONCLUSION

Tibetan meditational music therapy has relaxing effect on autonomic nervous system, thus its use as a method of relaxation for day to day stress, needs to be understood. Studying in larger number of people, belonging to different age groups, different geographical origins, and different anthropological features as well as in different pathophysiological conditions will increase the power of study and thus its wider applicability.

As music is well known to bring one physical & mental relaxation, more studies are required with adequate number of participant to ascertain beneficial effect of meditational music on healthy and diseased so that this can be the part of medical therapy to achieve physical, mental & social well being thereby fulfilled the goal of world health organization (WHO).

Conflict of interest statement

The authors declare that there is no conflict of interest.

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