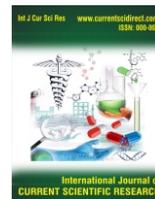




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Original article

Effect of the Indian Raga Bageshri on the body temperature of cancer patients on chemotherapy

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ABSTRACT

Keywords:

It is well known that hyperthermia is one of the adverse reactions produced by chemotherapy in cancer patients. We aimed to see the benefit of Indian music i.e. listening to raga Bageshri in cancer patients undergoing chemotherapy. In this randomized, single blinded study of 24 patients divided into two groups, the patients of music group listened to raga bageshri through a compact disc player for three days twice daily. Temperature measurements pre and post chemotherapy were observed by a blinded observer. The temperature changes were subjected to suitable statistical analyses and noted. The patients of both the groups were similar with respect to marital status, education, source of health information, stage of illness, psychological support and site of cancer. All patients satisfied the inclusion criteria and no patient was excluded from the study. There was a significant decrease in the body temperature of patients subjected to post- chemotherapy music intervention 40 after minutes of music exposure. There were no side effects. To conclude, listening to music, i.e. raga bageshri decreased body temperature significantly in patients with cancer undergoing chemo therapy.

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1. Introduction

Music is widely applied as a complementary therapy in health, since it produces relaxation and desired changes in an individual's psycho physiological state. Music can either speeden up or slow down heart rates, brain waves and respiration to achieve a desired goal [1]. Soft and slow music can lower body temperature and slow respiration, while loud and fast music can raise the body temperature and quicken respiration [2]. The present study is based on the effect of the Indian melodic mode, Raga Bageshri, on the body temperature of patients undergoing cancer chemotherapy. Melodic patterns are known to evoke positive emotions such as love, joy, and deep peace, and also to reduce negative emotions such as hostility and sadness. Several researchers have established a link between emotions and thermoregulation According to Ogawa T [3], the activity of thermosensitive neurons in the hypothalamic preoptic area in monkeys is affected by pleasant emotional stimuli like watching food, as well as aversive stimuli like seeing toy snakes.

A raga is a melodic mode used in Indian classical music, and music as such with many Indian ragas is found to be effective in healing various diseases [4]. Raga Bageshri was chosen because of its potential in inducing positive emotions like love, being believed to depict the emotion of a woman waiting for reunion with her lover [5]. The aim of the study was to explore the effect of music therapy based on Raga Bageshri in the body temperature of cancer patients undergoing chemotherapy.

2. Materials and Methods

The study was designed to explore the effect of music therapy based on Raga Bageshri in the body temperature of cancer patients undergoing chemotherapy. The research work was done in a tertiary care centre in Chennai. The study purpose was discussed with the consultant of the sample and the ethical committee of the hospital and acceptance to conduct the study in the cancer unit was obtained. The study purpose was explained to the sample, the confidentiality of the sample was assured and consent was obtained from the sample to conduct the study. 24 subjects with breast cancer undergoing cancer chemotherapy were selected for the study. The inclusion criteria included those receiving chemotherapy for the first time, interested in listening to Indian

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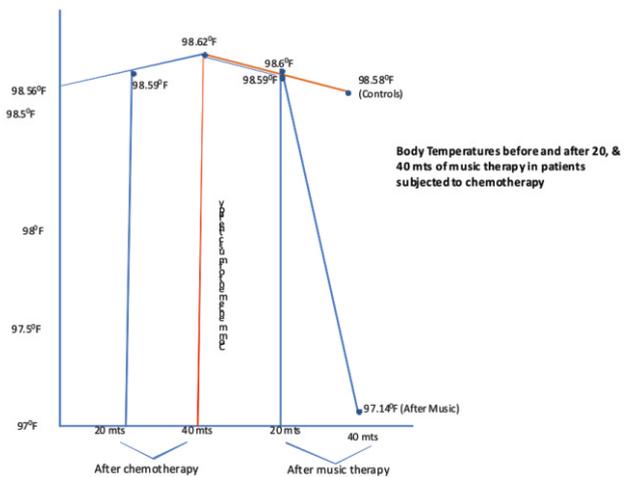
classical music, and staying in the hospital for three days. The sample consisting of 24 women between the age group of 30 – 50 years with breast cancer receiving chemotherapy for the first time were randomized and allocated either to music listening (Group music - n=12) or routine nursing care only (Group control - n=12) by a sealed envelope technique. The basic demographic data such as age, marital status, education, source of health information, stage of illness, psychological support, site of cancer and number of children were collected by interview schedule and health record. The treatment group received 20 minutes of music therapy based on Raga Bageshri twice a day at the time of 7 am and 7 pm for three days in the conducive environment through headphones using a Compact Disc and a suitable player. The surface body temperature was recorded before and 5 minutes after intervention using a thermometer kept under the tongue in the experimental group, the same schedule followed in the control group with routine care. The observed parameter i.e. temperature was done by a blinded nurse who was not aware of the intervention. It is impossible to double blind as the nature of the study does not allow this. Any other side effect or complaint if said was noted. The data were spread in an excel spread sheet with application of SPSS 16 software for statistics. Temperature differences between the experimental and the control group after chemotherapy was calculated using student t-test and analyzed.

3. Results

The patients of both the groups were similar with respect to marital status, education, source of health information, stage of illness, psychological support and site of cancer. (See table 1) All patients satisfied the inclusion criteria and no patient was excluded from the study. Considering both treatment times, there was no difference between the groups in body temperature 20 minutes post chemotherapy. There was a significant decrease in the body temperature of patients subjected to post- chemotherapy music intervention after 40 minutes of music exposure (p<0.001). (See graph 1)

Table 1 showing Distribution of demographic data of cancer patients undergoing Chemotherapy

Demographic Variables	Group Experimental		Control	
	Number	% age	Number	% age
Age in years	8	66.6%	4	33.3%
a) 41 -50	8	66.6%	4	33.3%
b) 51-60				
Marital status	10	85%	8	66.6%
a) Married	2	16.6%	4	33.3%
b) Windowed				
Stage of illness	11	91.6%	10	85%
Stage III				
Stage IV	1	8.33%	2	16.6%



4. Discussion

It is well known that hyperthermia is one of the adverse reactions produced by chemotherapy in cancer patients. Due to the cytotoxic action of the anti-cancer drugs, chemical messengers are released which act on the hypothalamic thermoreceptors. As a result, heat production is increased and heat-loss mechanisms are suppressed. The temperature setting of the brain, thermostat, is suddenly raised, and the body temperature is regulated at this new value [6].

In our study, the results demonstrate the profound effects that music can exert through the mind-body connection. This is because music moves from the ears to the center of the brain and the limbic system, which governs the emotional responses as well as involuntary processes as body temperature and blood pressure [7]. The auditory nuclei have counterparts in other systems and the auditory system encompasses temporal, parietal and frontal brain regions, partially overlapping the visual system as well. Listening to soothing Indian ragas which emanate compassionate feelings seems to invoke a deep meditative state [8]. Documented changes in body temperatures induced by meditative states and such type of meditative state can be accomplished by music [9].

Apart from the toxins raising the “set-point” for the body temperature, these patients may suffer from emotional hyperthermia or “psychogenic fever”, due to the psychological stress elevating the core temperature itself. This mechanism of emotional hyperthermia has been reported by Takakazu [10], who states that this psychogenic fever is suppressed by anxiolytic, neuroleptic, and anti-depressive drugs. Therefore, we can surmise that Indian classical ragas like Bageshri which radiate positive emotions like love and compassion, may exert their thermoregulatory effects by acting on the emotional component responsible for the elevated body temperature. The preoptic area of the hypothalamus is concerned with regulation of body temperature [11, 12], while the limbic areas of the brain seem to handle the conscious experience or inner emotions such as

feelings of fear, love, anger, joy, anxiety, hope and so on. The vibrations of 'love' which enrich the atmosphere when this rag is rendered, may act on these complex neuronal mechanisms to activate the heat-loss mechanisms like sweating, vasodilation etc., thus lowering the body temperature in these patients. The limitations of our study include the sample size, unmonitored parameters like, blood pressure, heart rate and anxiety scores. More scientific studies with larger samples are necessary to establish the beneficial effects of music therapy.

5. Conclusion

In cancer patients, during chemotherapy hyperthermia may accompany. Listening to music, i.e. raga bageshri decreased body temperature significantly. We suggest that such complimentary therapy can be used in selected cases of cancer chemotherapy

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