Effect of Music on Quality of Life in Stable Angina: A Randomized Controlled Trial

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Abstract

Introduction: Quality of life associated with coronary artery disease can be affected by number of factors. Even though standard treatment has improved survival of such patients, the quality of life may be less than ideal as the disease affects the physical, social, and emotional functioning of such individuals. Therefore improvement of the quality of life of the patients with coronary artery disease is vital. Though music has been identified having a potential benefit in improving quality of life for many years, researches conducted to recognize the effect of music on quality of life were sparse. Therefore the aim of this study was to determine the effect of frequent long term listening to Indian classical music on quality of life in chronic stable angina (SA) patients. Methodology: This single blind randomized clinical trial was conducted for one month. The intervention group of 30 patients listened to a music based on Indian classical system at home twice a day complementary to their regular treatment. The control group of 30 was only on their usual treatment. Both groups were assessed before and after the intervention for the quality of life by the Sinhala version of SF-36 questionnaire. Results: A statistically significant increase of scores for physical function by 16.17 (p < 0.01), for role-physical—40.83 (p < 0.01), for body pain—11.03 (p < 0.01), for general health—17.9 (p < 0.01), for vitality—17 (p < 0.01), for social functioning—15.37, for role emotional—37.87(p < 0.01), for mental health—16.66 (p < 0.01), overall physical health by 20.6 (p < 0.01), the overall mental health by 20.84 (p < 0.01) and the total score of quality of life by 21.6 (p < 0.01) was observed in the study group after the intervention; but not in the control group. Conclusion: Listening to the music based on Indian classical system significantly improved the quality of life of stable angina patients. Therefore music therapy has a potential benefit in considering for

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use as complementary to conventional treatment for stable angina in improving quality of life.

Keywords

Music, Music Therapy, Relaxing Music, Indian Classical, Stable Angina, Quality of Life, SF-36

1. Introduction

Myocardial Infarction (MI) affects not only the physical health of the patient, but also the emotional, social and functional aspects of life. Consequently, the views of the patient may be different compared to the view of the clinician regarding the success of management. Therefore, management of MI which is considered as a success by the clinician may not be perceived in the same way by the patient or by the patient's family. Hence the aim of treating MI should not only be to minimize the morbidities and mortalities related to MI, but also to uplift the quality of life (QoL) of the patient [1]-[3]. QoL of the MI patients can be affected by number of factors associated with MI such as emotional and physical distress, depression, other comorbidities in addition to the drugs and other management procedures used in the treatment [3] [4]. Though the prognosis after MI has improved dramatically with the advances of management during last few decades [5] [6], the QoL of the patients is adversely affected [4] [7]. Therefore, improving QoL after myocardial infarction remains a challenge for physicians and it has to be taken into consideration when assessing the improvement after medical or surgical treatment.

Relaxing Music and Quality of Life of Ischaemic Heart Disease

Relaxing music has been used for centuries to promote healing, to enhance the QoL and it is often used in the management of stress [8]. It is considered as a complementary therapy along with other treatments to help patients cope mentally and physically with their diagnosis [9]. But no published data are available in use of relaxing music as a method of improving the QoL of post MI patients.

Effect of relaxing music has been thought to be due to a complex neurophysiological phenomenon which affects entire nervous system and the stress hormones [10]. Through these mechanisms it reduces the rate of formation of the atheromatous plaque, the metabolic rate, heart rate, blood pressure, free fatty acids and oxygen consumption and hence, music therapy reduces the severity of the disease [11] [12]. Additionally, as it relieves pain through endorphins secreted from the pituitary gland and affects the higher centres of the brain such as cerebral cortex and limbic system, music therapy would enhance the disease related QoL. As music therapy is relatively inexpensive [13], considered safe and has no side effects [14], it is easy to practice and more accepted by the general population. Therefore, if it could be considered in the management of patients with ischaemic heart disease, it would help to reduce the health related cost associated with cardio vascular disease related problems which would consume the largest proportion of the health budget in future especially in low and middle income countries [15]-[17]. Therefore the aim of this study was to determine the effect of frequent long term listening to Indian classical music on quality of life in chronic stable angina (SA) patients.

2. Methodology (Figure 1)

This study was an extension of a single blind randomised controlled trial conducted to investigate the effect of music on symptoms and state of ischaemia in SA [18] [19].

This was conducted at the coronary care unit, National Hospital, Sri Lanka from May 2007 to June 2008. Ethical approval was obtained from the ethics review committee of University of Sri Jayawardhanapura, Sri Lanka. Those who assessed and analysed the outcome were blinded to patient treatment status.

The estimated sample size was 60 calculated for the effect size of 20% from the base line of the time taken to 1 mm ST segment depression in exercise ECG at $\alpha = 0.05$ and power at 0.8 (80%).

Both male and female patients between 45 to 65 years of age with clinically diagnosed chronic stable angina confirmed by exercise ECG using Bruce protocol were selected as the sample. Patients who had any other heart
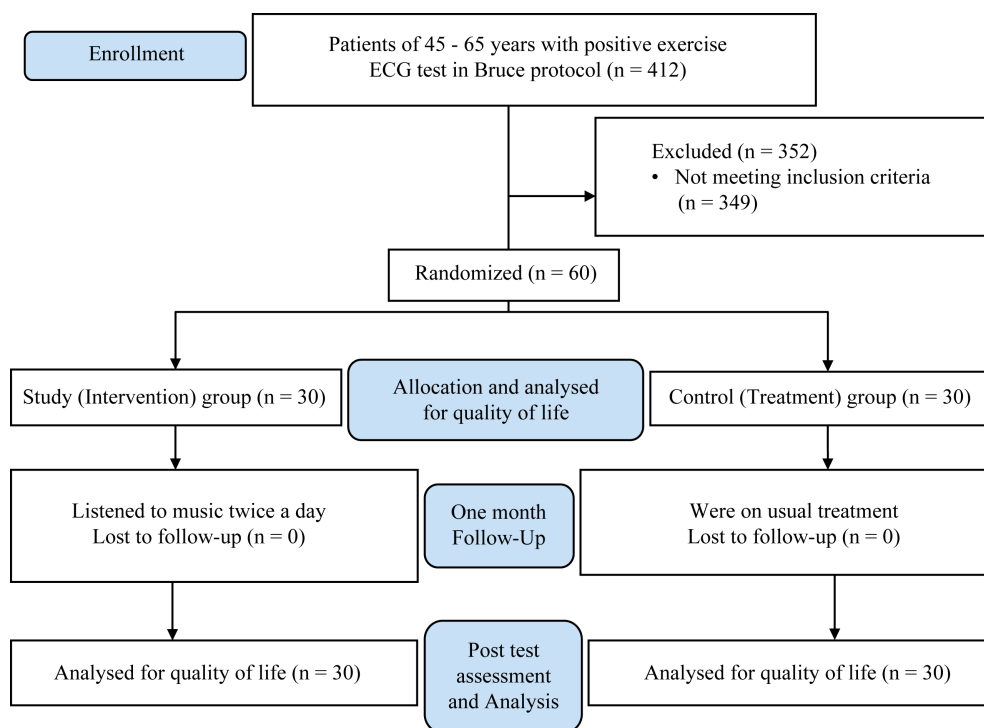
Figure 1. Methodology.

diseases or any other chronic medical or psychological illness and whose clinical condition was not stable which would require frequent change of the treatment were excluded. After assessing the eligibility of 412 patients of 45 - 65 years of age with positive exercise ECG, 60 patients were selected for the study (352 patients were excluded—349 did not meet the selection criteria and 3 refused for participation). 30 patients were recruited to each intervention (study) and control (treatment only) groups by restricted randomisation technique with the allocation ratio of 1:1 after obtaining the informed written consent.

2.1. Intervention

The intervention period was one month. The intervention group was provided an audio compact disc (CD) with a music based on Indian classical Rag DarbariKanada which lasts about 22 minutes to listen till the end of the track complementary to their usual medicines for a period of one month. According to the empirical studies, this rag has shown a positive effect on cardio vascular system [20]. Patients listened to music twice a day preferably early in the morning and in the evening using either ear or head phones. Special measures were taken to ensure the compliance of the study individuals. During the whole period of one month, the control group was kept only on their usual medicines.

2.2. Data Collection

Data were obtained from the participants at the time of recruitment for the study (Pre test) and after the completion of intervention period (Post test). QoLwas assessed by using the validated version of health related quality of life questionnaire Short form-36 (SF-36). Eight basic components of quality of life viz. physical function, role physical, body pain, general health, vitality, social functioning, role emotional and mental health were measured. Moreover summary measurements such as overall physical health, mental health and the total score were also assessed.

Each component of SF-36 questionnaire was analysedusing the standard scoring system provided with the questionnaire. Scores are ranged from 1 - 100 for each component. To analyse the data, independent or paired t tests were used where applicable. The significant level of a statistical test was considered as 0.01 and 0.05. Significance obtained from the statistical tests ≤ 0.01 were all considered as 0.01.

3. Results

All the patients who had been selected for the study attended for the post test assessment with 0% loss to follow up.

3.1. Baseline Data

As this was an extension of two studies published [18] [19], the base line data were same as mentioned in the **Table 1** of the previous research [19]. Both groups were approximately similar in the measured socio demographic variables. Female to male ratio in intervention and control groups were 1:5 and 1:3.3 respectively. About 63% were between 45 to 55 years. Almost all were married except 1 in the study group. Though majority indicated that they were neither current smokers nor current alcohol drinkers, about 40% and 30% were social drinkers of alcohol in study and control group respectively.

12 participants from each group were on treatment for less than 1 year while rest were on treatment for more than 1 year. Both groups were almost similar in current drug treatment for the heart disease.

3.2. Influence of Intervention on Quality of Life

Except bodily pain in which $p < 0.05$ (68.1 vs 54.8), there was no statistically significant difference in the scores in other components of quality of life between study and control group before the commencement of the study ($p > 0.05$) [physical function: 59.8 vs 57.3; role physical: 35.0 vs 41.7; general health: 40.7 vs 42.7; vitality: 57.7 vs 57.0; social functioning: 71.0 vs 74.7; role emotional: 37.7 vs 53.3; mental health: 61.9 vs 65.3]. There was no statistically significant difference between the two groups ($p > 0.05$) in overall physical health (52.1 vs 50.6), overall mental health (53.8 vs 58.6) and total score (54.1 vs 55.9) as well.

There was a statistically significant improvement in all eight components and overall physical health, mental health and total score in the quality of life measured using SF-36 in the study group compared to the control group after the intervention period of one month ($p < 0.01$) [physical function: 76.0 vs 50.0; role physical: 75.8 vs 31.7; body pain: 79.1 vs 56.6; general health: 58.6 vs 42.9; vitality: 74.7 vs 51.8; social functioning: 86.4 vs 71.9; role emotional: 75.6 vs 45.6; mental health: 78.5 vs 58.8: overall physical health: 72.7 vs 46.5; overall mental health: 74.7 vs 54.1; total score: 75.7 vs 51.2]. In the study group, post test scores for all eight components and for overall results were higher than the scores of the pre-test. This increase of the scores observed in the study group after the intervention period was statistically significant ($p < 0.01$). On the other hand, for the control group, except for body pain and general health, post test scores of the other components were lower when compared to the pre test scores. The slight increase in scores observed in body pain and general health were not statistically significant ($p > 0.05$). Reduction of post test scores of the control group for physical function, vitality and mental health were also statistically significant ($p < 0.01$, $p < 0.05$ and $p < 0.01$ respectively). For all other components including overall results, the reduction in scores were not significant ($p > 0.05$) (**Table 1** and **Table 2**).

Table 1. Effect of intervention on eight components of quality of life.

Variable	Study group (N = 30)			Control group (N = 30)		
	Pre test	Post test	p*	Pre test	Post test	p*
Mean Physical Function (SD)	59.8 (19.0)	76.0 (15.8)	<0.01	57.3 (21.4)	50.0 (23.3)	<0.01
Mean Role-Physical (SD)	35.0 (40.8)	75.8 (36.8)	<0.01	41.7 (39.0)	31.7 (38.2)	>0.05
Mean Body Pain (SD)	68.1 (22.1)	79.1 (13.4)	<0.01	54.8 (2.9)	56.6 (29.5)	>0.05
Mean General Health (SD)	40.7 (18.7)	58.6 (15.5)	<0.01	42.7 (21.3)	42.9 (20.6)	>0.05
Mean Vitality (SD)	57.7 (14.3)	74.7 (10.2)	<0.01	57.0 (14.8)	51.8 (15.7)	<0.05
Mean Social Functioning (SD)	71.0 (26.0)	86.4 (15.8)	<0.01	74.7 (22.8)	71.9 (25.5)	>0.05
Mean Role Emotional (SD)	37.7 (37.9)	75.6 (39.1)	<0.01	53.3 (39.8)	45.6 (45.1)	>0.05
Mean Mental Health (SD)	61.9 (18.9)	78.5 (15.6)	<0.01	65.3 (17.3)	58.8 (17.4)	<0.01

*Paired t test.

Table 2. Effect of intervention on overall results of quality of life.

Variable	Study group (N = 30)			Control group (N = 30)		
	Pre test	Post test	p[*]	Pre test	Post test	p[*]
Mean Overall physical health (SD)	52.1 (16.4)	72.7 (13.9)	<0.01	50.6 (15.9)	46.5 (16.3)	>0.05
Mean Overall mental health (SD)	53.8 (17.5)	74.7 (15.0)	<0.01	58.6 (15.1)	54.1 (18.1)	>0.05
Mean Total score (SD)	54.1 (17.9)	75.7 (14.9)	<0.01	55.9 (15.4)	51.2 (17.3)	>0.05

[*]Paired t test.

4. Discussion

With the results of the current study, it suggests that the use of music complementary to the usual management of IHD helped to improve the QoL of patients with IHD significantly. Even though there was no similar published study conducted earlier, observed results of our study supported the results obtained by previous studies conducted to find out the effect of music on heart rate, anxiety and pain in heart disease patients at various settings such as acute care setting, during cardiac catheterization and coronary angiography [21]-[23].

Drug therapy is a major component of treatment of MI. However, it may also induce side-effects which adversely influence quality of life [24]-[27]. With the results of our study, the quality of life of the patients who were on music therapy in addition to medical management improved significantly compared to patients who were only on medical management. Moreover, from our study, no adverse effects due to music listening for a prolonged period were observed and hence this also confirms the current evidence of safety of relaxation music in therapeutic use [14]. This perceived improvement of the QoL in stable angina patients may be due to the significant improvement of severity of symptoms and the state of ischaemiaas observed in the previous parallel studies [18] [19] and hence the effect of music on underlying pathophysiology of myocardial ischaemia. Therefore, this would further help the scientists to understand the pathophysiological phenomenon of the effect of relaxing music. Furthermore, it would help to formulate newer theories for explaining the effect of music such as metabolic shifting which is postulated by scientists in order to find out newer therapies for the treatment of IHD [28] [29].

Due to the lack of previous evidence, the intervention period of the current study was restricted to one month. Similar to most studies conducted elsewhere in the world, our study also observed the effect of music in a smaller sample. If a study is conducted for a longer period in a larger cohort, it would confirm the feasibility and acceptability of music as complementary treatment and its effect on quality of life and cardiac morbidity. Therefore, our study justifies further studies as definitive, large-scale, randomized clinical trials.

5. Conclusion

Listening to the music based on Indian classical system twice a day for one month period complementary to usual treatment significantly improved the quality of life of SA patients aged between 45 and 65 years measured by SF-36. A similar improvement did not observe in the control group who were only on prescribed medicines. Therefore, listening to music can be considered as a complementary to regular treatment for SA which is also cost effective.

Acknowledgements

Competing Interests

The authors declare that they have no competing interests.

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