



ISSN: 2456-0057
IJPNPE 2018; 3(1): 2027-2030
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www.journalofsports.com
Received: 05-11-2017
Accepted: 06-12-2017

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Stress management program on pulse rate and blood pressure

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Abstract

Background: Disorders of cardiovascular system especially hypertension and ischemic heart disease are leading causes of death all over the world. Stress is one of the important factors precipitating above diseases. In today's life stress is inevitable. Meditation and stress management are important to reduce the stress.

Aims, settings and design: In the present study effect of 6 weeks of stress management programme was studied on pulse and blood pressure.

Methods and materials: For present study 75 (38 males and 37 females) volunteers were selected. Volunteers were subjected to stress management programme, they practiced various breathing exercises, some asana and relaxation technique each day 20 minutes for 6 weeks. Pulse and B.P. were recorded before and after the practicing session and results were statistically analysed.

Statistical analysis: Results obtained were compared with the control readings taken before the session. Student's 't' test was applied for the results.

Result: Comparison of results was done by statistical analysis. There was significant reduction in pulse rate in both males and females. However there was no significant effect on blood pressure in both.

Conclusion: In the present study stress management programme caused significant reduction in pulse rate. There was however no significant reduction in systolic or diastolic blood pressure in the volunteers. This was probably due to short duration (6weeks) of stress management programme. Long duration of such programme should prove more beneficial in order to reduce the blood pressure and should be employed widely in the society.

Keywords: Pulse rate, blood pressure, and stress management programme

Introduction

Nowadays stress is an absolutely inevitable part of life. Stress causes hormonal changes [1, 2, 3], biochemical changes [4], various illnesses and psychosomatic diseases [5, 6]. Linkage between body and mind are now well appreciated and therefore one can use yogic practices in preventing and treating such stress related illnesses. Several studies have been done on effect of various yogic practices on cardiovascular functions and its therapeutic effects in cardiovascular diseases [7- 19].

The present study examined the effects of stress management program on pulse rate and blood pressure.

The stress management program followed in the present study composed of breathing exercises, some yogic asanas and mudras.

Goal of the present study was to find out the effects of stress management programme on pulse and B.P.

Materials and methods

One hundred and fifty volunteers (75 males and 75 females) were selected. Following criteria were used for selecting the volunteers.

- 1) Age between 20 to 40 years
- 2) No history of heart attack, hypertension, diabetes, or any other chronic illness that required regular pharmacological treatment.
- 3) No history of major psychiatry disorders, current alcohol abuse/ dependency disorders.

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Each volunteer was explained the whole programme. Interested and co-operative volunteers were selected. Written consent was obtained from volunteers. The volunteers were asked to discontinue if they felt giddy. An approval of institutional medical ethics committee was obtained before commencing the study. Name, age, sex, height and weight of each volunteer were recorded. Then pulse rate and blood pressure was measured as given below in each volunteer and the readings were noted as controlled readings.

Pulse rate: Placing three fingers on the radial artery pulse rate for full one minute at complete rest of the volunteer was measured for three times and average was taken and noted.

Blood pressure: Volunteer was asked to lay on the bed for 15 minutes. Then with the help of sphygmomanometer his/her systolic and diastolic pressures were measured. Blood pressure was measured three times and average was noted as

systolic and diastolic blood pressure.

75 volunteers were selected for the present study consisting of 38 male volunteers and 37 female volunteers. All the volunteers underwent training session (6 weeks) and practicing session (6 weeks).

Stress Management programme-

- 1) Training session for 6 wee
- 2) Practicing session for 6 weeks

Stress Management Programme

Training session: Volunteers underwent stress management programme [24] training for 6 weeks. In this programme volunteers were explained about what is stress, different kind of stressors, mechanism by which stress acts on the body. Volunteers were taught about importance of holistic health and its role in stress management. Volunteers were also informed about importance of sprouts, fruits and proteins in the diet. Additionally they were taught some breathing exercises, mudras, and asanas as shown in the table.

Steps	Program	Duration
1	Stress and stressors	2 Hours
2	Stress identification and construction of stressor hierarchy	1 Hour
3	Autonomic responses to stress	1 Hour
4	Effects of stressors on various systems of the body	1Hour
5	Importance of fruits, fluids, proteins in the diet. Training is given for the following [25] 1) Breathing exercises- 2) Anulom and vilom type of breathing 3) Mudras - Brahmamudra - Sinhmudra 4) Relaxation - Jaw relaxation - Makarasan - Nasikagra –drushti 5) Asanas - Bhujangasana - Vakrasana	10 mins

Session of Stress Management Programme

Practicing session: Volunteers practiced breathing exercises, mudras, asanas, and relaxation techniques given above every day in the morning 20 minutes for 6 weeks.

At the end of practicing sessions pulse rate and blood pressure were recorded from all the volunteers. The results obtained were compared with the control readings taken before the sessions.

Student’s “t” test was applied for statistical analysis of the results.

Results

- 1) There was highly significant fall in pulse rate in males and females. (Table1)
- 2) Comparison of results in males and females did not show statistically significant difference (Table 2) indicating that males and females have almost equal responses.
- 3) There was no significant change in systolic pressure before and after the sessions in both males and females. (Table 3)
- 4) There was no significant change in diastolic pressure before and after the sessions in both males and females. (Table 4) indicating that the session had no effect on systolic and diastolic pressure in males and females.

Table 1: Comparison of Pulse Rate per Minute– Before and After the Sessions in Males and Females

Groups		No. of Observations	Mean (x)	S.D.	S.E.	t- value	p-value	Significance
Group-II (Males)	Before	38	77.97	2.16	0.467	16.927	<0.0004	Highly Significant
	After	38	70.05	1.90				
Group-II (Females)	Before	37	77.16	3.49	0.682	10.296	<0.0004	Highly Significant
	After	37	70.14	2.24				

Table 2: Comparison of Pulse Rate per Minute In males and females

Groups	No. of Observations	Mean (x)	S.D.	S.E.	t- value	p-value	Significance
Group-II Males	38	8.0	1.5	0.639	0.3122	0.7566	Not Significant
Group-II Females	37	7.0	3.0				

Table 3: Comparison of Systolic Pressure (mm of Hg) – Before & After the Session in Males & Females

Groups		No. of Observations	Mean (x)	S.D.	S.E.	t- value	p-value	Significance
Group-II (Males)	Before	38	124.890	4.449	0.904	2.320	0.0200	Not Significant
	After	38	122.789	3.357				
Group-II (Females)	Before	37	122.900	6.630	1.446	1.0027	0.3174	Not Significant
	After	37	121.450	5.780				

Table 4: Comparison of Diastolic Pressure (mm of Hg) – Before & After the Session in Males & Females

Groups		No. of Observations	Mean (x)	S.D.	S.E.	t- value	p-value	Significance
Group-II (Males)	Before	38	84.736	4.99	1.131	2.2388	0.81	Not Significant
	After	38	84.77	4.865				
Group-II (Females)	Before	37	82.43	6.74	1.462	0.9577	0.337	Not Significant
	After	37	81.03	5.8				

Discussion

In the present study there was significant decrease in pulse rate in males and females. Similarly there was no significant difference in the effect caused in males and females indicating that stress Management Programme was equally effective in reducing the pulse rate. Many workers have studied effects of TM on resting pulse rate or heart rate. Shirely Tell *et al.* [26] reported decreased heart rate in subjects mentally repeating meaningful and non meaningful syllable. According to her repeating non-meaningful syllable is equivalent to TM. Decreased heart rate reported is due to reduced sympathetic activity.

Ayesha A. Khanam *et al.* [27] also reported reduction in basal heart rate as an effect of yogic asanas, meditation and Anulom-vilom breathing in asthmatic patients. Total period of yogic exercises in this study was of seven days. In such a small period there was significant decrease in heart rate due to reduced sympathetic activity.

Several workers have studied the effects of various types of asanas, relaxation techniques and breathing yogic exercises on heart rate or pulse rate. Paul Christophy *et al.* [30] observed significant reduction in heart rate during relaxation technique. D.D. Kulpati *et al.* [31] observed significant reduction in heart rate in volunteers suffering from chronic obstructive lung disease practicing different yogic asanas. Santha Joseph *et al.* [32] found significant decrease in heart rate in patients doing asanas and breathing exercises for three months.

K.N. Udupa *et al.* [33] studied the effects of different yogic asanas and physical exercises on heart rate and found that group doing particular asanas had significant decrease in heart rate after 6 months of practice whereas some asanas (other group) and physical exercises had not affected the heart rate. The group which showed reduction in heart rate practiced relaxation asanas such as Shavasana.

However M. Satyanarayan *et al.* [34] reported no change in heart rate after yogic exercises and relaxation. Similarly Dennis M. Davidson *et al.* [7] also reported that relaxation therapy did not change the heart rate in patients with organic heart disease. Shirley Tells *et al.* [35] studied effect of Anulom-vilom type of pranayama on pulse rate and reported that surya Anulom-vilom (right nostril breathing) causes significant increase in heart rate and Chandra Anulom-vilom (left nostril breathing) does not show any effect on heart rate.

From above discussion it is concluded that, in the present study significant decrease in pulse rate observed can be attributed mainly to some relaxation asanas such as makarasana, jaw relaxation.

In the present study effect of stress management programme on systolic and diastolic blood pressure was studied. It is found that there was no significant change in systolic or diastolic blood pressure in males and females both.

Several workers have studied the effects of different yogic exercises on systolic and diastolic blood pressure. Chandra Patel [19] reported significant fall in systolic and diastolic blood pressure of hypertensive patients. Barvy Backwell *et al.* [9] studied effect of 12 weeks of TM practice and found significant reduction in blood pressure and anxiety score. He has suggested that TM may be a therapeutic adjunct in patients with hypertension.

Several investigators have studied effect of different relaxation techniques on blood pressure and reported varied effects. Paul Christoph *et al.* [30] reported that there is no significant change in blood pressure after single session of relaxation technique. M. Satyanarayan *et al.* [34] studied the effect of santhikriya which is combined breathing and relaxation technique. His volunteers practiced santhikriya for 30 days. There was no significant change in blood pressure in them. Rolt G. Jacob *et al.* [12] also demonstrated that there was effect of relaxation therapy in only white coat hypertension. His study was done in patients whose blood pressure remained high despite use of anti hypertensive drugs.

Bernold F. Frankel *et al.* [14] studied the effects of relaxation techniques practiced for sixteen weeks and found that such techniques are not effective in reducing blood pressure and therefore not much useful as primary therapy in most of the hypertensives. Iris B. Goldstain *et al.* [15] also reported that there is no effect of ten weeks relaxation therapy on blood pressure.

Angele MacGrady *et al.* [18] studied the racial difference in response to relaxation and found that in black races there was decrease in systolic as well as diastolic blood pressure in response to relaxation. In black races of America there is greater incidence of hypertension because of increase in peripheral resistance.

K.N.Udupa *et al.* [33] studied effects of different asanas and physical exercise and found only certain asanas (which included Shavasana) caused significant reduction in blood pressure. Santha Joseph *et al.* [32] reported significant reduction in blood pressure after three months of practice of certain asanas and concluded that yogic practice causes a gradual shift of autonomic equilibrium towards parasympathetic dominance.

Thus only few investigators found significant effects of relaxation techniques and asanas on blood pressure, while majority have concluded that relaxation techniques, asanas or breathing exercises are ineffective in reducing blood pressure. In the present study volunteers practiced stress management programme consisting of breathing exercises, certain asanas including makarasana, jaw relaxation. Present study agrees with majority of investigators and concludes that stress management programme did not reduce blood pressure in both males and females, so is not an effective therapeutic tool.

Thus in this study stress management programme was equally effective in reducing pulse rate and were ineffective in changing blood pressure.

Conclusion

In the present study stress management Programme caused significant reduction in pulse rate. There was however no significant reduction in systolic or diastolic blood pressure in the volunteers. This was probably due to short duration (6weeks) of stress management programme. Long duration of such programme should prove more beneficial in order to reduce the blood pressure and should be employed widely in the society.

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