

A COMPARATIVE STUDY OF BLOOD PRESSURE IN MEDITATORS AND NON MEDITATORS

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Abstract

Aims and Objectives: Cardiovascular disease (CVD) is the leading cause of death and disability in industrialized nations, as well as in developing countries, leading to premature morbidity and mortality, and to preventable losses of employment, earnings, and quality of life. The present study includes the effect of meditation on blood pressure.

Material and Methods: The study population of 100 subjects out of which 50 were Non-meditators and 50 were meditators attending Sainath Pathanjali Yoga Centre. Using sphygmomanometer and stethoscope blood pressure response to standing was recorded.

Results: The improvements in autonomic functions are seen in meditators in this study which are similar to other studies done on meditation and yoga.

Conclusion: In present study blood pressure response to standing difference of both systolic & diastolic was significantly higher in meditators than in non-meditators on change of posture from supine to erect indicating decreased sympathetic dominance.

Keywords: Cardiovascular disease, Systolic blood pressure, Diastolic blood pressure.

Introduction

The term stress has been defined as any change in the environment that changes or threatens to change an existing optimal steady state. Most of these stresses activate counter actions at the molecular, cellular or systemic level that tend to restore the previous state.⁽¹⁾ The stress response floods the body with chemicals that prepare the body for "fight or flight". But while the stress response is helpful in true emergency situations, where one must be alert, it wears the body down when constantly activated. Stress is the greatest disease of the modern society. Health is immensely influenced by mental state. Many of the physical and mental ailments are caused due to wrong programming of the mind. Mind can make the person sick or speed the healing process. Herbert Benson and many other researchers have shown that the body's natural relaxation response is a powerful antidote to stress. Relaxation techniques such as deep breathing, progressive muscle relaxation, meditation and yoga can help to activate this relaxation response. Meditation helps to promote and maintain the state of positive health. It

is said to be a good adjunct to most of the therapeutic methods.⁽²⁾ Yoga and meditation are economical, non-invasive practices that have become increasingly popular as a means of relieving stress, enhancing health and improving fitness. It has no appreciable side effects but has multiple collateral life style benefits.⁽³⁾

Material and Methods

Study design: 100 subjects

Study center:

Study was conducted in the department of Physiology, Kurnool medical college, Kurnool

Samplings/Study population:

The following categories are randomly selected for the present study.

Meditators- The meditators were practicing Raja yoga meditation for more than one year who regularly do meditation for one hour per day at Pathanjali Sainath Yoga Centre, Venkata Ramana colony, Kurnool urban area.

Non meditators- A group of people of Kurnool urban area who had never done meditation. The subjects were carefully selected at random who were aged between 31-50 years and were of either sex. They were willing to participate in the study and gave written consent.

Sample size

Sample size of Non meditators - 50 subjects.

Sample size of meditators - 50 subjects.

The following parameters were measured

- 1) Weight.
- 2) Height.
- 3) Blood pressure (systolic and diastolic)
 - a) During supine position.
 - b) During standing position.
 - c) Difference in both systolic and diastolic blood pressure.

Study Duration - 6months period. from 1-6-12 to 130-12-12 at Kurnool medical college.

Inclusion Criteria:

- a) Mediators -meditating for more than one year
- b) Non meditators - Who had never done any kind of meditation

Exclusion Criteria: hypertensives ,who are doing meditation less than 1 year.

Procedure: blood pressure response to standing with sphygmomanometer and stethoscope

Blood pressure response to standing

Again after 5 minutes of rest in supine position blood pressure was recorded .Then the subject was asked to stand up and the blood pressure was recorded immediately. Blood pressure response to standing was recorded on subject by using a mercury sphygmomanometer (Diamond) and stethoscope (micro tone) in right upper limb by auscultatory method.The postural fall of blood pressure was taken as difference between the systolic and diastolic blood pressure on supine and erect posture. This difference was considered after taking three recordings Three recordings were taken at an interval of 15 minutes and average of three values was calculated

A postural fall of systolic blood pressure of:

- 10 mm Hg or less was taken as normal.
- 11 – 29 mm Hg was taken as borderline.
- 30 mm Hg or more was taken as an abnormal response.

Immediately after standing from the supine position, **BP falls by 20 mm Hg** .These changes occur within 5-15 seconds

- A BP change on standing is to assess integrity of sympathetic system.
- Immediately after standing BP falls which activates baroreceptor reflex.
- Bp returns to normal within 15 seconds

When fall in systolic pressure more than 20 mm Hg or diastolic pressure fall more than 10 mm Hg with in 3 minutes of standing is called as Orthostatic Hypotension

Statistical Analysis: was done by-Mean values,Standard deviation,Paired and Unpaired “t “ test.,Chi Square test. Probability value (p value) P <0.05 is considered as significant

Results:

The present study entitled study of effect of meditation on autonomic functions was conducted in the Department of Physiology, Kurnool Medical College, Kurnool

Table 1: Distribution of study population showing two categories

Category	No.	%
Non mediators	50	(50)
Mediators	50	(50)
Total	100	(100)

Subjects who had never done any kind of meditation were chosen as Non-meditators. For this category Kurnool urban area people were selected. The meditator group consists of subjects who were meditating regularly for more than one year at sainath pathanjali sainath yoga centre, venkataramana colony Kurnool.

The study sample consists of 100 members, which includes two categories namely Meditators (50 members) and Nonmeditators (50 members).

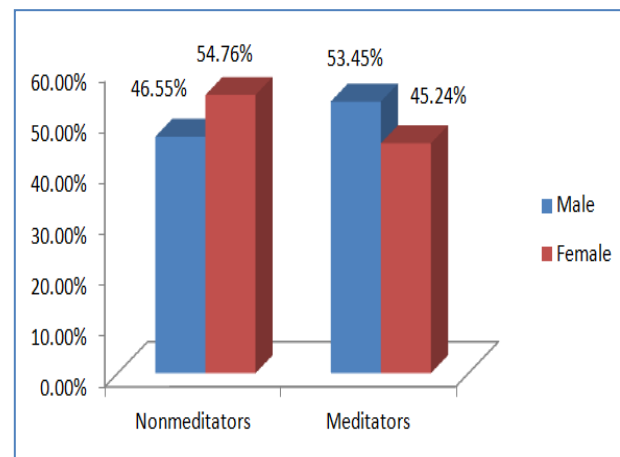


Figure 1:

Blood pressure response to standing were carried out on and sphygmomanometer after reinforcing the method of test on each subject. The following parameters were taken into consideration and the values obtained were recorded.

1. Systolic blood pressure in supine position
2. Systolic blood pressure in standing position.
3. Difference in systolic blood pressure
4. Diastolic blood pressure in supine position.
5. Diastolic blood pressure in standing position.
6. Difference in diastolic blood pressure.

Blood pressure response to standing is recorded

a) The mean Systolic Blood pressure in supine position in meditators was 118.84 ± 2.97 and in non-meditators was 127.88 ± 3.16 , Systolic Blood pressure in standing position in meditators was 101.64 ± 3.44 and in non-meditators was 112.6 ± 3.27 . Systolic blood pressure difference in meditators was 17.52 ± 2.44 and in non-meditators was 15 ± 3.73 . The difference in response shown by two groups is significant P value < 0.0001 is shown in Table No2 and depicted in Figure2.

Table 2:

PARAMETER	Mediators	Non mediators	t value	P value	
Systolic BP					
Supine	118.84 ± 2.97	127.88 ± 3.16	14.72	< 0.0001 S	
Standing	101.64 ± 3.44	112.6 ± 3.27	15.26	< 0.0001 S	
(mm Hg)	Difference	17.52 ± 2.44	15 ± 3.73	4.50	< 0.0001 S

The Autonomic functions tested among meditators and non-meditators are Blood pressure responses to standing are recorded.

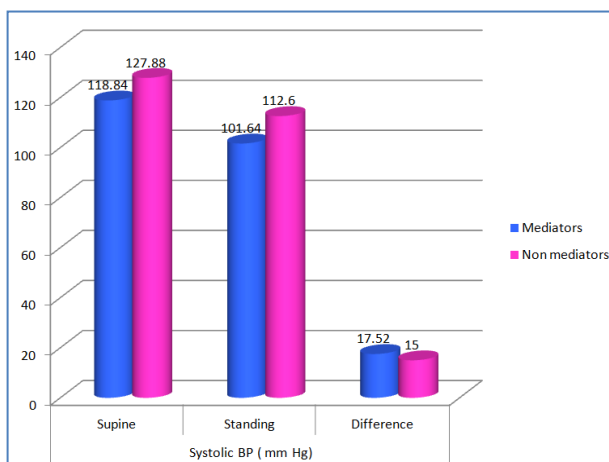


Figure 2: Systolic BP difference in meditators and non-meditators

b) In Diastolic Blood pressure in supine position in meditators was 73.48 ± 4.05 and in non-meditators was 80.48 ± 2.90 , Diastolic Blood pressure in standing position in meditators was 69.6 ± 3.68 and in non-meditators was 79.12 ± 2.86 . Diastolic blood pressure

difference in meditators was 3.84 ± 1.26 and in non-meditators was 1.4 ± 0.92 .

The difference in response shown by two groups is significant P value < 0.0001 is shown in Table No 3 and depicted in Figure3.

Table 3:

PARAMETER	Mediators	Non mediators	t value	P value	
Diastolic BP					
Supine	73.48 ± 4.05	80.48 ± 2.90	9.49	< 0.0001 S	
Standing	69.6 ± 3.68	79.12 ± 2.86	15.11	< 0.0001 S	
(mm Hg)	Difference	3.84 ± 1.26	1.4 ± 0.92	10.92	< 0.0001 S

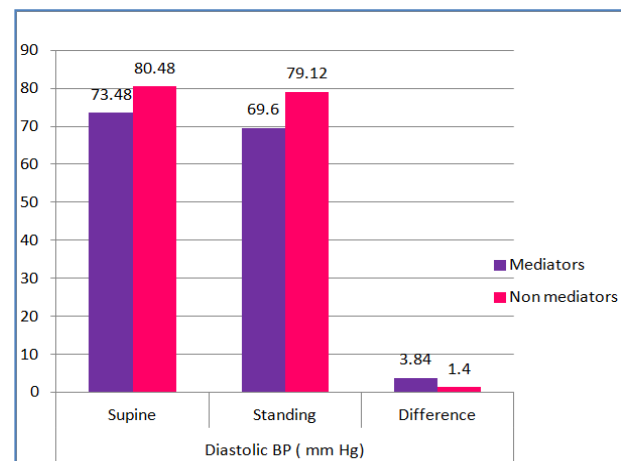


Figure 3: Diastolic BP difference in meditators and non-meditators

Discussion:

In the present study the study sample consists of 100 members of which,50 members belonged to non-meditators group and 50 members belonged to meditators group .The age group of subjects in both the groups ranged from 31yrs to 50 yrs.

The parameters chosen are

- 1) Blood pressure response to standing.

Using sphygmomanometer and stethoscope Blood pressure response to standing was recorded.

The improvements in autonomic functions are seen meditators in this study which are similar to other studies done on meditation and yoga.

This modulation of autonomic nervous activity might have been brought about through the effects of meditation on autonomic functions and mediated through the limbic system and higher areas of central nervous system. In present study Blood pressure response to standing difference of both systolic & diastolic was significantly higher in meditators than in non-meditators on change of posture from supine to erect indicating decreased sympathetic dominance.

The studies which correlate with my study are: In a Study on Effects of Meditation on Parasympathetic

Nervous System Functional Status in Meditators study conducted by Desh Deepak, Anant Narayan Sinha and Vimal Singh Gusain The basal cardiac parameters, heart rate and blood pressure were found to be uniformly lower in meditators than non meditators .The difference in blood pressure from supine to standing is higher in meditators compared to nonmeditators with $p < 0.001$ which is significant⁽⁴⁾ . In a study on effect of yoga on heart rate and blood pressure and its clinical significance studied by Indla Devasena* , Pandurang Narhare it was observed that significant reduction in the heart rate occurs in the subjects practicing yoga (P < 0.001). The systolic blood pressure was lowered to a highly significant level (P < 0.001). The diastolic blood pressure was reduced significantly (P < 0.001)⁽⁵⁾ In a study on effects of Hatha Yoga and Omkar Meditation on Cardio respiratory Performance, Psychologic Profile, and Melatonin Secretion by kasiganesan harinath,anand sawarup malhotra, hr, systolic blood pressure (SBP), diastolic blood pressure (DBP), and MAP in yoga and control groups before and after 3 months of yogic practices. In control group, the mean HR, SBP, DBP, and MAP after 3months of follow-up were not significantly different ($p > 0.05$) than the initial basal values. In the yoga group, after 3 months of yogic practices, the mean HR did not show any significant ($p > 0.05$) change. The systolic, diastolic, and mean arterial BP showed a significant reduction ($p < 0.001$) after the yogic practices. The orthostatic tolerance in the yoga group showed a slight but significant increase ($p < 0.05$) and did not show any significant alterations in the control group⁽⁶⁾ Contradictory to these results a study done by Solberg et al in 2004 found no significant change in systolic and diastolic Blood pressure either by meditation or by rest⁽⁷⁾ Change of posture from supine to standing involves an integrated reflex response of cardiovascular system mediated by baroreceptor sending afferent via IX and X cranial nerves; hence it is a delicate test of autonomic activity BP response to standing is dependent on baroreceptor reflex modifying circulatory responses It is a simple test to assess sensitivity of vasoconstrictor reflexes⁽⁸⁾ SBP and DBP were found to be lower in meditators in comparison to non-meditators⁽⁹⁾. The long term meditators seems to be confer further decrease in heart rate indicating a continued alteration of the physiological process involved. voluntary control of autonomic functions of a yogi in the form of stoppage of his heart beat was reported

by Kothari et al⁽¹⁰⁾ .Meditation by modifying the state of anxiety, reduces the stress induced sympathetic over activity, resulting in decrease heart rate. There is also decrease in arterial tone and peripheral resistance, resulting in lowering of blood pressure. This ensures better peripheral circulation and blood flow to the tissues. Highly significant reduction in heart rate and blood pressure is seen in long term meditators indicating continued alteration of the physiological process involved. Environmental conditions and a variety of behavioral factors such as stress, anxiety, attitudinal dispositions of the individual, influence the cardiovascular response. Meditation evokes a relaxation response and brings about behavioral changes. Practice of meditation produced a relaxation response even in the young adult subjects who had never practiced meditation before. The practice of meditation reduced the physiologic stress responses without taking away the beneficial effect of stress, namely, improved memory scores is observed in study conducted by Mohan et al⁽¹¹⁾ reducing existing imbalances of mechanical force vectors like meditation techniques⁽¹²⁾ Bhargava R, Gogate MG, Mascarenhas JF studied the effect of *pranayama* (both fast and slow) and showed an increase in vagal tone and a decrease in sympathetic activity⁽¹³⁾.

Conclusion:

Among the two categories evaluated in the present study reduction in Systolic and diastolic blood pressure suggests an altered autonomic balance in the subjects practicing meditation with predominance of the parasympathetic system and relatively reduced sympathetic system. My request to Government is to introduce meditation in educational institutions as it is a simple, non-invasive relaxation technique to encounter the stress in students as they are further citizens of our country

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