Effect of mind body therapy (yoga, meditation & music) on elderly hypertensive people

Karuna Mittal[1], Parmendra Sirohi[2,*], KC Mathur[3], RP Agrawal[4], Vivek Agrawal[5]

[1]Research Scholar, [2,3,4]Professor, [5]Research Fellow, Dept. of Physiology, SP Medical College & AG of Hospital, Bikaner, Rajasthan

***Corresponding Author:**
Email: drpsirohi@gmail.com

Abstract

Objective: Hypertension is an important risk factor for cardiovascular morbidity and mortality, particularly in elderly. Several randomized controlled trials have firmly established that lifestyle modifications may be the additional treatment for preventing or even treating milder forms of hypertension in elderly.

Material & Methods: 100 elderly (age >60yrs) hypertensive patients were randomly selected for this study. The selected cases were divided into two groups. Group 1 was taking conventional treatment with unsupervised exercise protocol while Group 2 went through a supervised mind body therapy. The following parameters were determined BMI, WHR, blood pressure, fasting blood sugar, lipid profile.

Results: In the group receiving mind body therapy there was a significant decrease in systolic as well as diastolic blood pressure (152.40±10.62 to 137.80±8.71 vs 95.72±4.21 to 86.87±2.85) respectively when compared with the group taking only conventional measures.

Conclusion: Based on results, mind body therapy, may therefore be considered as a useful adjunct to conventional therapy in management of metabolic syndrome.

Keywords: Mind body therapy; Hypertension

Access this article online

Quick Response Code:	Website: www.innovativepublication.com
	DOI: 10.5958/2394-2738.2016.00024.8

Introduction

Hypertension is an important risk factor for cardiovascular morbidity and mortality, particularly in the elderly. It is a significant and often asymptomatic chronic disease, which requires optimal control and persistent adherence to prescribed medication to reduce the risks of cardiovascular, cerebrovascular and renal disease[1].

Several randomized controlled trials have firmly established that treatment of hypertension in elderly significantly reduces the morbidity and premature mortality[2]. Lifestyle modifications may be the additional treatment necessary for preventing or even treating milder forms of hypertension in elderly. Weight reduction (results in a 5-20 mmHg decrease in SBP per 10kg less), dietary sodium reduction (2-8 mmHg decrease in SBP), physical activity (4-9 mmHg decrease in SBP), moderate alcohol consumption (2-4 mmHg decrease in SBP) should be the cornerstones of hypertension treatment in combination or not with active treatment[3]. Thus, in this study we applied the life style intervention therapy i.e. mind body therapy to see its benefits in management of hypertension.

Mind-Body medicine, one of five major branches of *Complementary and Alternative Medicine* therapeutics, uses behavioral techniques to augment the mind's capacity to affect bodily function and symptoms, utilizing varied approaches such as meditation, prayer, mental healing, and therapies that use creative outlets such as art, music, or dance. Out of these we have yoga, mediation and music in our study.

Yoga is a complete way of life rather merely some 'asanas', has great potential to provide easy, user friendly stress management techniques. Yoga life style methods have a potential to be of great value in prevention and treatment of coronary artery diseases and controls several abnormalities of hypertension[4]. Similarly, meditation the basic technique of 'Raja Yoga' is often looked upon as a relaxation technique to be used for treating stress and related illness. The third component of this therapy i.e. music is considered as a powerful to elders, extends into the field of kundalini yoga. The basic scale (bilaval) balances the three elements when it is sung .It does this through vibration of the body at the point where mind and the neuroendocrine system intersect at chakra points on the shushma nadi, within the spinal cord[5].

Though a great literature is available on MBT but least possible work has been done on its effect on elderly hypertensive people. Since this disease is increasing day by day with the advancement of civilization, this has created a great enthusiasm to uncover the secrets.

Material and Methods

The prospective randomized case control study was conducted in the Department of Physiology, S.P. Medical College, Bikaner in the close collaboration with Medicine Department, P.B.M. Hospital, Bikaner.

Inclusion criteria

One hundred elderly (age >60yrs) hypertensive patients were randomly selected for this study. Within 15 days baseline investigations were completed. A detailed history of each patient was obtained regarding the age, sex, and year of diagnosis of hypertension, age at onset and duration of hypertension and associated risk factors, family history and any associated illness as per the attached Proforma. Age at onset of the disease was defined as the age at the time of diagnosis, which was first recorded by a physician on the patient's chart or as told by patients.

Exclusion Criteria

Patients suffering from liver disease, arthritis, pulmonary tuberculosis, malabsorption, alcoholism and non cooperative patients were excluded from the study.

Division of Group I and Group II

The selected cases were divided into two groups randomly. These patients were advised to stick to treatment plan.

Group I: These patients were taking conventional treatment and unsupervised exercise protocol at home and served as control group.

Group II: These patients besides conventional treatment were gone through supervised mind body therapy and served as the study group.

Patients included in this group were asked to come daily or at least five times a week for continuous three months duration for a MBT therapy.

Before entering into the programme every patient was instructed about diet and it was done during entire session of exercise protocol also. Baseline parameters body mass index, waist to hip ratio, fasting blood sugar, blood pressure, lipid profile (TC, TG, HDL-C, LDL-C) were recorded initially. Weekly patients were evaluated for blood pressure. After three months we analyzed the changes in blood pressure in both group of patients. Investigations were done under following headings.

Anthropometric Measurements

1. BMI
2. W/H ratio

Biochemical Indices

1. Fasting blood glucose (FBS)
2. Serum Lipid Profile

Clinical Investigations

1. Measurement of Blood Pressure by Sphygmomanometer.

Yoga Protocol

1. Health rejuvenating exercises (5 Mins.)
2. Body Posture (Asanas)
   a. Surya Namaskar/ Parmeshwar Vandana (3 min.)
   b. Vajrasana (3 min.)
   c. Suptpawan muktasana (3 min.)
   d. Bhujangasana (3 min.)
   e. Dwipaduttanasana (3 min.)
   f. Yogmudra (3 min.)
   g. Vakrasana (3 min.)
   h. Pashehimottanasana (3 min.)
   i. Konasana (3 min.)
   j. Sarwangasana (3 min.)
3. Abdomen exercises (7 min.)
4. Relaxation exercise
   a. Shavasana (15 min.)
   b. Transcendental meditation (5 min.)

Music Protocol

Music therapy is individually applied via musical auditions, including five stages:

1. Musical stimulation
2. Sensation
3. Situation
4. Reflection
5. Behavioral alteration

Music sessions were of one hour duration with two or three short sessions with breaks.

Songs based on following different ragas are supposed to cure various parameters.

RAGA	Application
Bageshri	Diabetes, Hypertension, it cures feeling of darkness.
Bhupati Todi, Ahir Bhairav, Kalyan	High Blood Pressure.
Malkans, Asawari	Mental instability.
Chandra Kaun	Heart ailments, Diabetes.
Darbari Kanara, Tilak Kamod, Hans Dhwani, Kalawati and Durga	Relaxation and easing tension.
Dhanashri	Keep the mind stable and relief from acidity.
Bihag, Bahar, Kafi, Khamaj	Insomnia, Sleep disorders.
Bhoop and Bhajans	Attentions deficit, lack of concentration in children.
Shivaranjani	For intellectual intelligence, memory problems.

Persons were also listening to different musical concerts which have soothing action on our minds & hearts for example: "Bansuri Vadhan" by Pd. Hari Prasad Chaurasia, "Shehnai" by Bismillah Khan, "Tabla" by Ustad Zakir Hussain, "vocal" by Pd. Bhimsen Joshi, "Santoor" by Shiv Sharma. Light instrumental music was also added.

Statistical Analysis

The data were expressed as mean±SD. Statistical analysis were performed according to an intention to treat strategy. Quantitative data were presented as mean±SD and the student's 't' test was used to compare the differences. All p values were 2 tailed, p value <0.05 was considered significant. Analysis was performed by using SPSS software version 16 computer.

Results

The given table shows the comparison between mean values of baseline parameters of both the groups. All values are showing the non significant difference ($p<0.01$) in between both the groups. It means the groups were similar in all aspects and all the compounding factors were eliminated.

When we compared the post treatment recording of systolic of blood pressure in between group 1 (147.39±3.17 mmHg) and group 2 (137.71±8.72 mmHg), highly significant difference was found ($p<0.001$). Similar findings were observed in diastolic blood pressure recordings i.e. 93.59±2.29 mmHg in group 1 and 86.18±2.15 mmHg in group 2 ($p<0.001$). (Fig. 1)

Table 1: Baseline characteristics

Parameters		Initial (0 month)		
		Control group (Mean±SD)	Study group (Mean±SD)	p value
Age (yrs.)		53.87±11.22	54.01±8.83	< 0.4
Sex (M/F)		26 M, 20F	25M, 29F	NS
BMI (kg/m^2)		32.20±3.53	31.70±2.03	< 0.1
Waist Circumference (cm)		96.90±9.54	96.19±9.05	< 0.6
Blood Pressure (mmHg)	Systolic	152.6±8.73	152.40±10.62	< 0.2
	Diastolic	95.96±2.25	95.72±4.21	< 0.2
Glycemic Control	FBS (mg%)	201.46±65.80	202.71±60.15	< 0.2
Lipid Profile (mg%)	Cholesterol	264.54±15.52	262.89±14.94	< 0.8
	Triglyceride	221.61±104.65	215.09±93.08	< 0.6
	HDL-C	32.85±4.10	32.40±3.61	< 0.1
	LDL-C	187.37±21.24	180.47±22.68	< 0.8
	VLDL-C	44.32±20.93	43.33±18.62	< 0.6

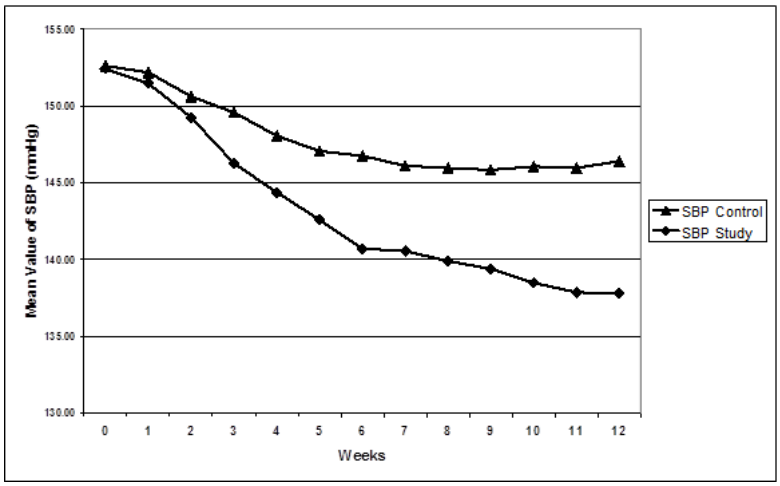

Fig. 1: Comparison of Systolic Blood Pressure (Weekly)

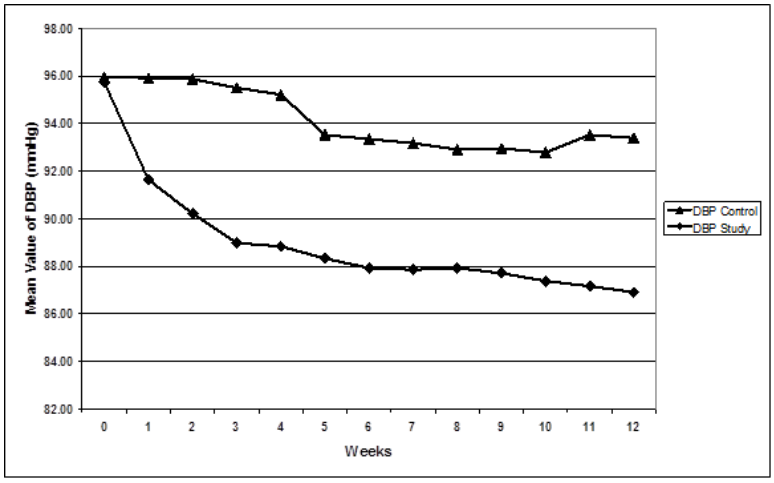

Fig. 2: Comparison of Diastolic Blood Pressure (Weekly)

Discussion

The main reason for elderly hypertension could be that as age increases the blood vessels become more and more stiff and along with that many factors like change, in lifestyle i.e. sedentary life style, poor diet; medications and most importantly the increasing level of stress. By eliminating effect of these reasons with the help of some complementary alternative medicine the blood pressure of the elders can be brought to normal. Thus present study was conducted to evaluate the influence of mind body therapy (Yoga, Meditation and Music therapy) on elderly hypertensive people.

When the comparison of the systolic and diastolic blood pressure for the two groups was done a significant ($p<0.01$) difference was found which was the aim of the study.

Researchers indicated the beneficial effect of bio-feedback aided behavioural methods in reducing the mild hypertension. They included hypertensive patients-along with other CVD risk factors and had demonstrated significant pressure decline, among the subject receiving behavioural Yoga therapy versus control receiving usual care[6].

In another random study Murugeson et al assigned 33 hypertensives into three groups. The experimental group I underwent selected Yoga practices, experimental group II received medical treatment by the physician and the control group did not participate in any of the treatment stimuli. Yoga imparted in the morning and in the evening with 1 hour session for a total period of 11 week. Medical treatment comprised drug intake everyday in the whole experimental period. The result of pre-post hoc test with ANCOVA revealed that both the treatment stimuli (i.e. Yoga and drug) were effective in controlling the variables of hypertension[7].

Negative findings in a three months study in participants completing a Yoga programme compared with those receiving an aerobic exercise programme were also observed. No impact on blood pressure but a significant reduction in heart rate and increase in heart rate variability in participants completing a Yoga programme were reported in those findings[8].

The beneficial effect of yogic lifestyle intervention on blood pressure has been supposed to be due to the following reasons:

1. Chronic stress induced sustained muscular contraction reduces lumen /diameter of blood vessels in the muscles. It in turn increases blood pressure. Yoga reduces the stress which in turn decreases the blood pressure.
2. Certain postures in yoga offer controlled pressure on the kidneys and the adrenals, thereby regulating blood supply to these vital organs which mainly regulate B.P. through secretions of hormones like rennin, angiotensin, adrenalin etc.
3. The medulla oblongata in the brain has the respiratory center and the vasomotor centre (which regulates the B.P.) side by side. Fast breathing in stressful situations tends to overspill the electric signals over vasomotor centre, thus increasing B.P. Yoga (pranayama) regulates breathing and reduces the signal overspill from respiratory center, thus reducing B.P[9,10].
4. The increase in the activity level of monoamine oxidase along with reduction in dopamine and hydroxylase activity seems to support the conviction of autonomic balance presumably yogic practices leads to predominance of parasympathetic system due to a significant decrease in dopamine-B-hydroxylase. Thus the yoga practice of regular three months results in gradual shift of autonomic equilibrium towards a relative parasympathetic dominance[11].
5. In patients of essential hypertension in addition to restoring the normal baroreflex sensitivity, yogic exercises are seen to relieve the stress induced sympathetic hyperactivity, thereby restoring the blood pressure even in elderly patients with long history of essential hyperreason[12].

6. The analytical activity of cortex is not given any scope and thus subjects experience complete relaxation and tranquility. In such a condition the parasympathetic predominance is established.
7. Music appears to exert physiologic effects through the autonomic nervous system music effectively reduces anxiety[13]. The exact mechanism by which music modifies brain function is not clear. Some studies suggest that music leads to increased calcium CAM dependent DA synthesis in the brain, thus causing reduction in blood pressure. Music might regulate or affect various brain functions through dopaminergic neurotransmission, and might thereof one be effective for ratification of symptoms in various disease that involve DA dysfunction[14].

Conclusion

Hypertension is one of the most important causes of mortality and morbidity in the elderly. As consequences of high prevalence, a substantial proportion of cardiovascular disease in elderly is attributable to hypertension. MBT is believed to bring about a stable autonomic balance and hypometabolic effect and improve the biochemical and hormonal profile. Music, the important component of MBT, widely used to enhance well being, reduce stress and distract patients from unpleasant symptoms. Music appears to exert physiologic effects through autonomic nervous system. Music effectively reduces anxiety, heart and pancreas are easily affected organ by music. So mind body therapy is effective in reducing blood pressure in hypertensive people. It is an adjunct therapy, a supportive measure, indeed.

References

1. Hamilton GA. Measuring adherence in a hypertension clinical trial. *Eur.J. Cardiovas. Nurs*. 2003;2:219-228.
2. Amery A. Birkenger W. Briks P. et al. Mortality & morbidity results from the European working party on high blood pressure in the elderly trial. *Lancet*. 1985;1:1349-54.
3. National high blood pressure education program working group. *Report on hypertension in the elderly*. 1944;23;275-85.
4. SC Manchanda, R Narang, Life style intervention: Is there enough evidence for action?, The metabolic syndrome' VII annual symposium, New Delhi, India. Dec 2000-Ranbaxy science foundation.
5. Janardana I. Yoga's Music. *Yoga Today*. 1998;2:9.
6. C Patel, MG Marmot, DJ Terry. Controlled trial of bio-feedback added behavioral methods in reducing mild hypertension. *Br Med J (clin Res Ed.)* 1981;282:2005-8.
7. R Murugeson, N Govindarajulu and TK Bera. Effect of selected Yogic practices on the management of hypertension. *Indian J Physiol Pharmacol*. 2000;44(2):207-210.
8. A Bowman, R Clayton, A Murray, J Read, M Subhan, G Ford. Effects of aerobic exercise training and yoga on the baroreflex in healthy elderly persons. *Eur. J clin. Invest*. 1997;27:443-9.
9. Yoga point yoga vidhya dhyan. *Hypertension & yoga* – by Sujit Chandratreyan.
10. Sreedhar Pulipati. Healthy living >> Yoga >> Yoga and Naturopathy for hypertension. 2009; Apollo life well new for complete health.
11. Joseph S, Sridharan R, Patil S et al. Study of some physiological and biochemical in subjects undergoing yogic training. *Indian J Med Res*. 1981;74:120-4.
12. Selvamurthy W, Sridharan K, Ray Us, Tiwari RS, Hegde KS, Radhakrishnan U, Sinha KC. A new physiological approach to control essential hypertension. *Indian J Physiol Pharmacol*. 1998;42(2):205-213.
13. Kemper KJ, Danhauer SC. Music as therapy. *South Med J*. 2005;98(3):282-8.
14. Denetsu Sutoo, Kayo Akiyama. Music improves dopaminergic neurotransmission: demonstration based on the effect of music on blood pressure. Institute of medical science, university of Tsukuba, Tsukuba, Ibaraki 305-8575.