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Research Article

Impact of Yoga on Blood Pressure and Quality of Life in Patients with Hypertension

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ABSTRACT

Background: Medical treatment of hypertension is not always sufficient to achieve blood pressure control. Despite this, previous studies on supplementary therapies, such as yoga, are relatively few. The investigator evaluated the effects of yoga intervention on blood pressure and quality of life in patients in selected hospital diagnosed with hypertension. Methods: Adult patients (age 20–80 years) with diagnosed hypertension were identified at OPD of Meenakshi Medical College and Hospital. In total, 83 subjects with blood pressure values of 120–179/≤109 mmHg at baseline were enrolled. At baseline, the patients underwent standardized blood pressure measurement at the health care center and they completed a questionnaire on self-rated quality of life (WHOQOL). There were three groups: 1) Yoga class with investigator (n = 28); 2) Yoga at home (n = 28); and 3) a control group (n = 27). The participants were matched at the group level for systolic blood pressure. After 12 weeks of intervention, the assessments were performed again. At baseline a majority of the patients (92%) were on antihypertensive medication, and the patients were requested not to change their medication during the study. Results: The yoga class group showed improvement in blood pressure or self-rated quality of life, while in the yoga at home group there was a decline in diastolic blood pressure of 4.4 mmHg ($p < 0.05$) compared to the control group. Moreover, the yoga at home group showed significant improvement in self-rated quality of life compared to the control group ($p < 0.05$). Conclusions: A short yoga program for the patient to practice at hospital seems to have an antihypertensive effect, as well as a positive effect on self-rated quality of life compared to controls. This implies that simple yoga exercises may be useful as a supplementary blood pressure therapy in addition to medical treatment.

Keywords: Hypertension, Yoga, Quality of Hospital, Complementary therapies.

INTRODUCTION

Hypertension is one of the most common diseases in the world, affecting approximately 26% of the adult population[1]. Persistent hypertension increases the risk of developing coronary heart disease, stroke and other cardiovascular diseases, such as heart failure[2,3]. Hypertension is a common diagnosis in hospitals and its consequences are considerable[4]. Although many antihypertensive drugs are available, less than one third of individuals in India who receive treatment reach their target blood pressure (BP) (140/90)[5]. Previous studies have also shown that yoga may reduce BP[6-9]. These studies showed significant reduction of systolic BP (SBP) of up to 6 mmHg and a significant reduction of diastolic BP (DBP) of up to 5 mmHg compared to baseline[6,8,9]. Whether these results are clinically significant remains an unanswered question. If yoga has a BP lowering effect it may be useful as a supplementary therapy in addition to medical treatment. Since some studies have shown that yoga positively impacts quality of life and subjective well-being[10-12], patients who regularly practice yoga may also experience better quality of life. The novelty of the present study is that it was performed in hospitals where most patients with hypertension are treated. The purpose of this matched controlled study was to determine the effects of yoga on BP and quality of life in patients in hospitals diagnosed with hypertension. Another aim was to investigate whether there is a difference in effect on BP and quality of life if yoga is practiced on a regular basis in a group led by a investigator or if the patient practices a shorter yoga program individually at home.

MATERIALS AND METHODS

This study was a prospective two-arm single-center study. This was carried out in the medicine OPD of Meenakshi College and Hospitals (MMCH & RI) during the month of January 2016. Adult patients (age 20–80 years) at Meenakshi Medical college and Hospital, Enathure, Kanchipuram, diagnosed with hypertension, with BP 120–160/80–100 mmHg when last measured by previous visit (e.g. normal, normal high and grade 1 hypertension levels), were eligible for inclusion in the study. The

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Table 1: Baseline characteristics.

SNO	Baseline characteristics	Intervention group 1 Yoga class Group n = 28 Mean (SD)	Intervention group 2 Yoga class Group n = 28 Mean (SD)	Control group group 3 n = 28 Mean (SD)
1.	Age in years	66.2 (7.7)	64.0 (10.3)	60.8 (11.0)
2.	% female	67.9	71.4	59.3
3.	BMI (Kg/ m2)	29.7 (7.0)	28.5(7.3)	28.8 (4.0)
4.	SBP (mmHg)	143.8 (14.9)	143.6(14.2)	144.3 (14.5)
5.	DBP (mmHg)	89.0 (7.6)	88.4(6.2)	89.8 (7.3)
6.	Well controlled (%)	39.3	92.9	37.0
7.	On medication (%)	96.4	92.9	85.2
8.	WHO 1	3.59 (0.8)	4.07(0.7)	3.96 (0.7)
9.	WHO 2	3.04 (0.9)	3.61(0.9)	3.31 (0.7)

Table 2: BP after intervention and adjusted mean change in BP.

S. No	Category	Intervention group1, Yogaclass group		Intervention group 2 Yoga at home group		group 2	Control group
		OC (N=28) Mean(SE)	PPS (N=21) Mean(SE)	OC (N=26) Mean(SE)	PPS(N=20) Mean(SE)	OC (N=26) Mean(SE)	PPS (N=23) Mean(SE)
1.	SBP (mmHg)	144.1 (2.6)	144.3 (3.1)	137(2.7)	138(3.2)	141.5 (2.7)	142.6 (3.0)
2.	Change from baseline	0.3 (2.6)	-0.2(3.1)	-6.8(2.7)	-6.1(3.2)	−2.3 (2.7)	−1.9 (3.0)
3.	P-value	0.917	0.954	.013**	.o61	0.381	0.527
4.	Difference vs. control	2.6(3.7)	1.7 (4.3)	-4.4(3.8)	-4.2(4.4)	3.1(2.5)	3.0(2.8)
5.	P-value	0.482	0.693	.241	.341	0.329	0.454
6.	DBP (mmHg)	89.4(1.6)	89.5 (1.9)	84.7(1.6)	85.3(1.9)	89.9 (1.6)	90.2 (1.8)
7.	Change from baseline	02(1.6)	0.3 (1.9)	-4.4(1.6)	-3.9(1.9)	0.8 (1.6)	1.01 (1.8)
8.	P-value	0.889	0.890	.008**	.045**	0.612	0.571
9.	Difference vs. control	-0.6(2.5)	−0.8 (2.6)	-5.2(2.3)	-4.9(2.6)		
10.	P-value	0.794	0.771	.025*	.064		
11.	Yoga sessions during intervention	47.2	52.7	63.9	72.6	-	-

patients with BP values of 120–179/≤109 mmHg at baseline were eligible for enrollment. The hypertensive patients with extreme BP values, since these would probably be under medical adjustments, expected inability to understand instructions about the yoga exercises, physical or mental incapacity to carry out yoga exercises and language difficulties/interpreter needs. Patients with systolic BP (SBP) ≥180mmHg and/or diastolic BP (DBP) ≥110 mmHg or SBP <120 mmHg at baseline were also excluded. They were informed about the study and asked to provide written informed consent. BP was measured using automated devices. The participants completed a questionnaire on quality of life (WHOQOL[13]) and a health status and lifestyle survey designed for this study. The participants were sorted numerically based on their SBP. There were no statistically significant differences in BP at baseline between the three groups.

Interventions

The yoga practiced in the present study is a form of Kundalini yoga developed at the Institute for Medical Yoga (IMY)[14]. A typical Kundalini yoga class incorporates the following six elements: 1) tune-in with mantra, 2) warm-up or breathing exercises, 3) physical exercises or postures and breathing exercises, 4) deep relaxation, 5) meditation, and 6) tune-out with mantra. In the beginning yoga session both intervention group got same yoga demo classes separately. The participants received one detailed yoga instruction module and yoga calendar. The participants were instructed to mark with a cross the dates and also submit after their yoga training. The intervention group 1 (28 persons) were practiced yoga for 30 minutes every day at hospital with investigator, intervention group 2 (28 persons) were practiced at home and it was monitored by one of their family member and recorded. There were no changes made for control group 3 (27 persons). BP measurement was standardized in a sitting position, right arm, two readings (three readings when the first and second readings differed by >5 mmHg)[15], and was carried out by investigator using a validated BP monitor (Omron i-C10). BP was measured after 5–10 minutes of rest. After 12 weeks of intervention, the assessments were performed again.

Table 3: Self-rated quality of life and self-rated health after intervention.

S.NO	self-rated health	Intervention group 1 OC, n = 40 Mean (SE)	Intervention group 1 OC, n=40 Mean (SE)	Control group OC, n = 26, Mean (SE)
		WHO1		
1.	Average score	3.98(0.09)	4.21(.09)	3.92(0.09)
2.	Change from baseline	0.12 (0.09)	.35(.09)	0.06 (0.09)
3.	Difference vs. control	0.29 (0.13)	.29(.13)	0.06 (0.13)
4.	P-value	0.027	.027*	0.640
		WHO2		
5.	Average score	3.44 (0.11)	3.68(.12)	3.41 (0.12)
6.	Change from Baseline	0.15 (0.11	.39(1.12)	0.11 (0.12)
7.	Difference vs.control	0.28 (0.16)	.28(.16)	0.04 (0.16)
8.	P-value	0.099	.099	0.826

RESULTS

The baseline characteristics of the patients in the three groups are presented in Table 1. There was a predominance of women in all three groups. The majority of the patients were overweight (BMI >25 kg/m2) and 92% were on antihypertensive medication (Table 1). At baseline, 37% of the patients were well controlled (≤140/90 mmHg). The most common single treatment was beta blockers (BB, 13%). The study was not powered to detect difference or change in morbidity, but there were no significant differences between the groups regarding prevalence of cardiovascular disease at baseline. This was also the case for the results regarding physical activity from the lifestyle survey. Table 2 shows changes in SBP and DBP in the two groups. No significant differences in change in SBP from baseline between the yoga groups and the control group were detected. However, the improvement in DBP for the yoga at home group was significantly greater than that for the control group (−4.4 ± 1.6 vs. 0.8 ± 1.6 mmHg; OC, $p < 0.05$). The yoga at home group also showed significant improvements in self-rated quality of life compared to the control group (0.29 ± 0.13 vs. 0.06 ± 0.13 for WHOQOL, Item 1; OC, $p < 0.05$) (Table 3). There were no significant differences in change in DBP or self-rated quality of life between the yoga class and the control groups. Further analyses of the WHOQOL domains did not demonstrate any significant changes in any group. The yoga group showed significant improvements in self-rated quality of life compared to the control group (0.29 ± 0.13 vs. 0.06 ± 0.13 for WHOQOL, Item 1; OC, $p < 0.05$) (Table 3). There were no significant differences in change in DBP or self-rated quality of life between the yoga class and the control group. Further analyses of the WHOQOL domains did not demonstrate any significant changes in any group. For questions (WHOQOL, Items 1–2), refer to Table 1. Significant difference compared to the other groups ($p < 0.05$) (ANOVA). OC, observed cases; SE, standard error of the mean.

DISCUSSION

The present study was conducted to determine the effects of yoga on BP and quality of life in patients in hospital. Our results demonstrated a significant reduction in DBP in the patients who practiced yoga compared to the control group ($p < 0.05$). The yoga at home group also showed a greater improvement in quality of life than the control group ($p < 0.05$). Patients who practiced yoga in a group with an instructor, however, did not experience significant improvements in BP or self-rated quality of life compared to the control group.

As reported, the yoga at home patients rated their quality of life at baseline higher than the other groups. This fact could indicate a higher motivation among these patients to try something new to further improve their quality of life. On the other hand, one could argue that it is more difficult to improve quality of life when starting from a higher level. It is unclear why the yoga class group did not have any reduction in BP. One possible explanation lies in the yoga exercises the two groups performed at home. The number of sessions may have influenced the result, but the yoga class group patients spent on average about 50% more time doing yoga than the yoga at home group patients. Being in a class environment with other patients could also make some people feel insecure and uncomfortable. The results imply that simple yoga exercises may be useful as a supplementary BP therapy in addition to medical treatment. It is well known that physical activity has a BP lowering effect. For those patients who are not able or willing to do demanding exercise, an easy yoga program could be an alternative. According to a Swedish literature review, the mean reduction of BP from an antihypertensive drug is 10/ 5 mmHg, when used alone[2]. The effect of an additional drug is mostly lower. In view of this fact, the mean reduction of DBP of 4.4 mmHg, shows that the effect of the short yoga program could be of clinical relevance and interest when used as a supplement to other treatment.

CONCLUSION

A short yoga program for patients to practice at home seems to have an antihypertensive effect, as well as a positive effect on self-rated quality of life. This implies that simple yoga exercises may be useful as a supplementary BP therapy in addition to medical treatment. One could also speculate as to whether this in the long run could influence medicine intake, side effects and drug costs. However, larger, randomized controlled studies are needed to confirm the antihypertensive effect

of yoga and to identify the groups of patients that will benefit most from yoga-based treatment. We also need to study the long-term effects of yogic treatment on hypertension.

ABBREVIATIONS

BMI: Body mass index; BP: Blood pressure; SBP: Systolic blood pressure, DBP: Diastolic blood pressure; FP: Fasting plasma;OC: Observed cases; PPS: Per protocol set;

REFERENCES

1. Wolff et al.BMC Cardiovascular Disease Disorders 2013 "Impact of yoga on blood pressure and quality of life in patients with hypertension – a controlled trial in primary care, matched for systolic blood pressure. 13:111 http://www.biomedcentral.com/1471-2261/13/111.
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J: Global burden of hypertension: analysis of worldwide data. Lancet 2005,365:217–223.
3. Swedish Council on Technology Assessment in Health Care. Moderately Elevated BloodPressure; 2013. (Published October 2004). [http://www.sbu.se/upload/Publikationer/Content0/1/Blodtryck_2004/Hypertoni_vol2.pdf]Accessed October 16.
4. National Institute for Health and Clinical Excellence. Clinical management of primary hypertension in adults. NICE Clinical Guideline 2011; 2013. [http://www.nice.org.uk/nicemedia/live/13561/56008/56008.pdf] (Published August 2011). Accessed October 6.
5. Kjeldsen SE, Naditch-Brule L, Perlini S, Zidek W, Farsang C: Increased prevalence of metabolic syndrome in uncontrolled hypertension across Europe: The Global Cardiometabolic Risk Profile in Patients with hypertension disease survey. J Hypertens 2008, 26:2064–2070.
6. Cohen DL, Bloedon LT, Rothman RL, Farrar JT, Galantino ML, Volger S, Mayor C, Szapary PO, Townsend RR: Iyengar Yoga versus Enhanced Usual Care on Blood Pressure in Patients with Prehypertension to Stage I Hypertension: A Randomized Controlled Trial. Evid Based Complement Alternat Med 2011, 2011:546428.
7. Mourya M, Mahajan AS, Singh NP, Jain AK: Effect of slow- and fastbreathing exercises on autonomic functions in patients with essential hypertension. J Altern Complement Med 2009, 15:711–717.
8. Cade WT, Reeds DN, Mondy KE, Overton ET, Grassino J, Tucker S, Bopp C, Laciny E, Hubert S, Lassa-Claxton S, Yarasheski KE: Yoga lifestyle intervention reduces blood pressure in HIV-infected adults with cardiovascular disease risk factors. HIV Med 2010, 11:379–388.
9. Subramanian H, Soudarssanane MB, Jayalakshmy R, Thiruselvakumar D, Navasakthi D, Sahai A, Saptharishi L: Non-pharmacological Interventions in Hypertension: A Community-based Cross-over Randomized Controlled Trial. Indian J Community Med 2011, 36:191–196.
10. Oken BS, Zajdel D, Kishiyama S, Flegal K, Dehen C, Haas M, Kraemer DF, Lawrence J, Leyva J: Randomized, controlled, six-month trial of yoga in healthy seniors: effects on cognition and quality of life. Altern Ther Health Med 2006, 12:40–47.
11. Moadel AB, Shah C, Wylie-Rosett J, Harris MS, Patel SR, Hall CB, Sparano JA: Randomized controlled trial of yoga among a multiethnic sample of breast cancer patients: effects on quality of life. J Clin Oncol 2007, 25:4387–4395.
12. Sharma R, Gupta N, Bijlani RL: Effect of yoga based lifestyle intervention on subjective well-being. Ind J Physiol Pharmacol.