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Original Article

Effect of Yoga on Hypertension

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***ABSTRACT*:**

Background: Hypertension is a major public health problem and is an important risk factor for stroke, coronary heart disease and renal failure. The blood pressure is not well controlled with drug therapy in large number of individuals, especially in the developing countries. There is a need for less expensive nonpharmacological alternative methods to control blood pressure. Yoga may be such cost-effective alternative. Several uncontrolled and randomized control trials have evaluated short- and long-term effects of yoga/meditation-based techniques in prehypertension and mild hypertension. **Materials& Methods:** We conducted a study on 50 hypertensive patients who were on medication and divided them into two groups. One group consisted of 25 patients who did yoga exercises and control group did not perform yoga. **Results:** There was a significant decrease in both systolic and diastolic BP in both the groups but in yoga group the decrease was more significant. **Conclusion:** Alternative approaches like yoga serves as an adjunct method to lower blood pressure.

Key words: Hypertension, Psychosocial stress, Yoga, modifiable risk factors.

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INTRODUCTION:

Non communicable diseases are no more the disease of developed countries now. Even in developing countries these diseases are predominant in modern world. Hypertension is a major health issue globally due to its prevalence and associated complications.[(1)] It is known to cause million deaths in world and deaths in India.[(2)] Around 970 million people presently suffer from hypertension and this figure is estimated to rise to 1.5 billion by 2025.[(3)] Complications associated with this are renal, cardiovascular, ophthalmic, stroke mainly. These complications also have a bad prognosis if not prevented at an early stage. Cardiovascular diseases prevalence is high in Indians, among these an important modifiable risk factor is hypertension.[(4)] Its incidence is around % and in coming years it is very important to control this epidemic of hypertension by modification of life style, dietary changes besides pharmacotherapy. Diet has a major role in prevention and treatment of hypertension. In addition to this physical exercise also plays a part in control of hypertension. Yoga plays a very important role in this. The term yoga is derived from Sanskrit word "YUJ" means to attach, to unite or to join.[(5)]

"Yoga chitha vritti nirodhah", means yoga controls the activities of mind. Yoga is a beneficial multifunctional therapeutic modality in the treatment of variety of psychological and medical conditions such as depression, anxiety, post traumatic stress disorder, hypertension, cardiovascular diseases, bronchial asthma, COPD, Diabetes Mellitus, hypercholesterolemia etc. A research study, has stated that yoga modulates the physiological system of the body specifically affecting heart rate. It is very important as yoga is free of adverse effects and provides other health benefits too.[(6)] Stress is one of the predisposing factors for hypertension. Hypertension is a leading risk factor for mortality and ranked 3rd as a cause of disability adjusted life years. Yoga reduces the cortisol levels thereby stress is reduced. Yoga promotes the flexibility of the arteries and reduces the rigidity of the arteries and also promotes the free flow of blood in the arteries thus resulting in control of hypertension.[(7)] Meditation and relaxation techniques offers a reduction in the diastolic and systolic blood pressures during the mental stress.[(8)] Several clinical trials

investigated the efficacy of non-pharmacological interventions and lifestyle modifications to reduce blood pressure.[9] The present study was conducted to see the effects of yoga on hypertension.

50 hypertensive patients were taken and the effect of yoga on hypertension was seen. 25 patients were asked to perform yoga and other 25 patients were refrained from yoga. The effect of yoga was seen and compared with other group. The patients in both the groups were asked not to stop antihypertensive medicines they were taking. Yoga exercises were done uniformly by all the patients as specified for a specified time. Blood pressure at first visit was taken followed by blood pressure reading after every week for two months. Mean blood pressure was taken and compared between two groups by using unpaired student t test. P value of less than 0.005 was considered to be statistically significant.

Inclusion Criteria: Patients suffering from primary hypertension without co-morbidity on antihypertensive medicine

Exclusion Criteria: Patients suffering from secondary hypertension, hypertensive patients without treatment, patients with co-morbidity

Prayer followed by omkar recitation, pranayam and asans were performed under the guidance of yoga expert.

Ardha pavanmuktasana: (Single knee bending): Lie on the supine posture, raise the single leg and slowly bend the knee and try to touch the forehead on the knee.

Uttaanpadasana (straight leg raising): Lie on the supine posture and slowly raise both the legs straight without knee bending. Maintain for 5 seconds with normal breathing. While exhaling slowly release both the legs without bending the knees.

Bidalasana (Cat pose): Sit in vajrasana and kneel down on the floor with placing the palms between the two knees, while inhaling arch the spine and look towards the navel region. While

exhaling make a curve in the spine and look upwards. Practice it for 5 times.

Uttanapadasana (Straight leg raising): Lie on supine posture and slowly raise the leg straight without knee bending.

Anuloma Viloma (Alternate nostril breathing): Sit in sukhasana. Close the right nostril with the thumb, exhale through left nostril then inhale through the same nostril. Close the left nostril with the ring finger, retain the breath then exhale through right nostril. Again inhale through right nostril retain the breath then exhale through left nostril. This is one round. Repeat this for 10 rounds.

Savasana (Relaxation posture): Lie on supine posture. Keep legs and hands apart. Keep eyes closed. Relax.

RESULTS:

Mean systolic and diastolic blood pressure was recorded in both the groups at 1st visit and weekly till two months (**Table 1**). Unpaired student t test was applied and both the groups were compared. Systolic BP decreased both numerically and statistically. Significant decrease was seen statistically at 5, 6, 7 and 8 weeks in systolic BP **(Table 2)**. There was numerical decrease in diastolic BP in both the groups but on comparison there was no significant difference till7th week but at 8th week the difference between two groups was statistically significant **(Table 3)**. After yoga there was significant decrease in both systolic and diastolic BP.

Table 1 Mean systolic and diastolic BP in test and control group

VISIT	TEST GROUP		CONTROL GROUP	
	Mean Systolic BP	**Mean Diastolic BP**	**Mean Systolic BP**	**Mean Diastolic BP**
First visit 0	160 ±8.9	100±9.8	158±7.3	100±9.6
1 week	160±8.2	98±7.6	157±6.9	100±9.3
2 week	157±7.6	98±6.8	163±4.6	98±6.7
3 week	153±6.3	96±7.4	156±6.7	96±7.2
4 week	147±5.2	93±6.5	153±7.2	94±6.3
5 week	140±7.5	90±6.4	150±5.9	90±5.4
6 week	139±6.9	87±4.2	147±4.5	89±6.7
7 week	134±7	86±5.2	143±2.8	90±7.4
8 week	126±5.4	82±5.3	140±4.6	88±3.4

Table 2 Comparison of systolic BP among test and control group

VISIT	TEST GROUP	CONTROL GROUP	Unpaired Student t test
	Mean Systolic BP	Mean Systolic BP	p value
First visit 0	160 ±8.9	158±7.3	0.6093
1 week	160±8.2	157±6.9	0.4134
2 week	157±7.6	163±4.6	0.0598
3 week	153±6.3	156±6.7	0.3423
4 week	147±5.2	153±7.2	0.059
5 week	140±7.5	150±5.9	0.0063 SS
6 week	139±6.9	147±4.5	0.0214 SS
7 week	134±7	143±2.8	0.0025 SS
8 week	126±5.4	140±4.6	0.0001 SS

SS- Statistically significant

Table 3 Comparison of mean diastolic BP among test and control group

VISIT	Test group	Control group	Unpaired student t test
	Mean Diastolic BP	Mean Diastolic BP	p value
First visit 0	100±9.8	100±9.6	1
1 week	98±7.6	100±9.3	1
2 week	98±6.8	98±6.7	1
3 week	96±7.4	96±7.2	1
4 week	93±6.5	94±6.3	0.7446
5 week	90±6.4	90±5.4	1
6 week	87±4.2	89±6.7	0.4590
7 week	86±5.2	90±7.4	0.2032
8 week	82±5.3	88±3.4	0.0114 SS

SS – statistically significant

DISCUSSION:

Our study showed significant decrease in systolic blood pressure but no change was seen in diastolic blood pressure. The results are similar to study of many studies. Cohen et al in their study reported significant decrease in systolic and diastolic BP after yoga.[10] Subramanian et al also reported significant decrease in both systolic and diastolic BP after yoga, exercises and reduced salt intake.[11] The effects of yoga on lowering blood pressure in more recent studies have mostly been modest however data from the Framingham Heart Study showed that a 2 mm Hg reduction in DBP could reduce the risk of stroke or TIA (transient ischemic attack) by 14%. While a 10 mm Hg reduction in SBP, seen with prescription drugs and in some meditation studies, is associated with a 30% relative reduction in risk of stroke. [12] Recently, a scientific committee of American Heart Association (AHA) has reviewed extensively the role of several alternative approaches beyond medication and diet to control HTN. The scientific committee has concluded that transcedental meditation and bio-feedback approaches showed modest

effect in reducing blood pressure (class II B, level of evidence B) .[13]

CONCLUSION:

Since hypertension is on rise there is a need to findout ways which are non pharmacological to control and prevent hypertension as there are many modifiable risk factors responsible for it. Yoga finds an important place in this as it is free of side effects.

LIMITATIONS:

Number of subjects taken were very less. Duration of study is also short. Other parameters like lipid profile, blood sugar could have been seen as these are usually associated with hypertension.

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