



Original Research Article

Alteration in Anthropometric Measurements before and After Yogic Exercises in Patients of Hypertension with Obesity

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ABSTRACT

Background: Hypertension and obesity are common in a large group of population worldwide. These people are at increased risk of cardiovascular, peripheral vascular and cerebrovascular disease. According to yogic belief, people can be relieved by the complications of hypertension and obesity by practicing yogic exercise. So our

Aim was observe beneficial effects of 3 month & 6 months of Yogic exercise on various anthropometric parameters in patients of hypertension with obesity.

Method: In order to determine effectiveness of yogic exercise, the anthropometric parameters (weight, height, BMI, blood pressure) before and after 3 and 6 months programme were analysed.

Result: At the end of the study, there was a significant decrease in mean blood pressure as well as weight and BMI of patients.

Conclusion: Yogic exercises would give benefit to the patient by reducing blood pressure, BMI and improve the status of patients

Keywords: Hypertension, Obesity, Blood pressure, Yogic exercise

INTRODUCTION

High blood pressure (hypertension) is one of the most important preventable causes of premature morbidity and mortality in the world. Overall prevalence for hypertension in India is 29.8%. Hypertension is a major risk factor for ischaemic and haemorrhagic stroke, myocardial infarction, heart failure, chronic kidney disease, cognitive decline and premature death. Untreated hypertension is usually associated with a progressive rise in blood pressure. ^[1] The cause of primary

hypertension is not known, although genetic and environmental factors may affect blood pressure regulation. ^[2] Several lifestyle interventions have been shown to reduce blood pressure. Apart from contributing to the treatment of hypertension, these strategies are beneficial in managing most of the other cardiovascular risk factors. Hypertension is one of the most serious negative health consequence associated with obesity. ^[3,4]

Obesity is partly regarded as an evolutionary issue. It has become a serious

health problem worldwide. It has been estimated that at least 3.4 million people die each year as a result of being overweight or obese. [2,5] Numerous studies have compared the appropriateness of various anthropometric indices for assessing obesity and predicting obesity-related health risks, including BMI, waist-to-hip ratio (WHR), waist circumference (WC), and waist-to-height ratio (WHtR). However, there is no agreement on which index should be applied universally for defining obesity. [6,7]

The health risks and health care costs associated with overweight and obesity are considerable. The etiology of obesity is multifactorial. The main treatment for obesity consists of dieting and physical exercise. [8] Diet programs may produce weight loss over the short term, but maintaining this weight loss is frequently difficult and often requires making exercise and a lower calorie diet a permanent part of an individual's lifestyle.

Yoga being a form of physical exercise is commonly translated as "union" and is the combination of heart, mind, and body. Practice of asanas, pranayamas and meditation result in reduced mental stress. Asana is a pose of the body or the posture which it assumes at the commencement of the practice. Pranayama is a yogic technique in which breathing controlled voluntarily. Yogic Practice and its Beneficial effect have been observed on physiological and physical state of body and mind. [9]

So in this study we observed beneficial effects of 3 month & 6 months of Yogic exercise on various parameters of obesity (Body weight, Body mass Index), parameters of hypertension (systolic and diastolic blood pressure) in patients of hypertension with obesity.

Aim:

To study the effect of Pranayama and certain Yogic Asanas on Body Mass Index (BMI)

To study the effect of Pranayama and certain Yogic Asanas on blood pressure

MATERIALS AND METHODS

This is a prospective study in which data was collected on 60 subjects with an age group of 40-60 yrs. Amongst these 40 were male subjects and 20 were female who attended the Yoga Life Modification Programme (YLMP) conducted between. All the subjects were comparatively new to yogic practices. The study was conducted in Siddharth Garden, Aurangabad after an informed and written consent from all the participants. Study programme consisted of an integrated package of theory and practice session, 1 hour each day of a 7 days outpatient course, interrupted by a one day weekend break. This course was given to batches of 25 patients each at a time. Each batch was followed for the duration of 6 months.

The set of asanas and pranayama included in the course [10]

I. Humming in meditative posture-

Vajrasana (Thunderbolt Pose)/Padmasana (Lotus Pose)/Sukhasana (Easy Pose)

II. Loosening Exercises

Warm ups: starting from the head, working towards the toes.

1. Neck rolls
2. Shoulder rotation
3. Arm rotation
4. Elbow movements
5. Wrist movements
6. Finger movements
7. Waist movements
8. Knee rotation
9. Ankle rotation
10. Toe movements

III. Asanas

(a) Standing

1. Ardhakatchakrasana (lateral arc pose)
2. Padahasthasana (forward bend pose)
3. Ardhashakrasana (backward bend pose)
4. Vrikshasana (tree pose)

(b) Sitting

1. Ardhamatsyendrasana (half-spinal twist pose)
2. Paschimatanasana (back stretch pose)
3. Konasana (angular pose)
4. Manduk asana (Frog pose)
5. Shashankasana(forward bending)

(c) Lying on stomach (prone)

1. Makarasana (crocodile pose)
2. Bhujangasana (cobra pose)
3. Dhanurasana (bow pose)
4. Śalabhāsana(Backbend)

(d) Lying on back (supine)

1. Uttitapadasana (straight leg raising)
2. Sarvangasana (shoulder stand pose)
3. Matsyasana (fish pose)
4. Pavanmuktasana (wind relieving pose)
5. Setubandhasana (bridge pose)
6. Markatasan(twisting pose)

IV. Deep Relaxation In Shavasana (Corpse Pose)

V. Pranayama (Breathing Practices)

Bhastrika (rapid breathing)

Bhramari (honeybee sound during expiration)

Anuloma- Viloma(Alternate Nostril Breathing)

Kapalabhati pranayam(short and strong forceful exhalations and inhalation happens automatically)

Udgeeth Pranayama(chanting of the Om mantra)

VI. Quick Relaxation In Shavasana (Corpse Pose)

VII. Humming In Meditative Posture-

Vajrasana (Thunderbolt Pose)/Padmasana (Lotus Pose)/ Sukhasana (Easy Pose)

Detail present and past history of these patients was taken to rule out common medical problems and restrictions for the study interventions. Anthropometric measurements-height and weight, blood pressure were measured.

Height:

Height of the patient was measured up to an accuracy of 0.5 cm on a scale

prepared on the wall. Patients were instructed to remove chapels' or shoes and stand on a flat floor by the scale with feet parallel and with heels, buttocks, shoulders and back of the head touching wall upright. The horizontal plate was gently lowered on the scalp to give correct height.

Weight:

Weight of the patient was taken up to an accuracy of 0.5 kg. Patient was asked to stand on the centre of the platform after removing chapels and without touching anything else. Reliability of weighing machine was verified initially with known weight. It was adjusted to zero each time before taking weight. Same weighing machine was used for recording weight of the subjects throughout the study.

BMI was calculated in kg/m² and for the purpose of analysis BMI was categorized as BMI 18.5 – 24.9 as normal,

BMI ≥ 25.0 as overweight, and

BMI ≥30.0 as obese.

Blood pressure was measured by an automated electronic device. Hypertension was categorized as

BP systolic 120-139mmHg & diastolic 80-89mmHg as normal and

BP systolic ≥140mmHg & diastolic ≥90mmHg as hypertension.

In order to determine effectiveness of yogic exercise, the data before and after 3 and 6 months programme were analysed by (Statistical Packages for Special Sciences) SPSS version 20 using paired t test. A p value <0.05 was considered as statistically significant.

RESULT

At the end of the study, the patients after performing yogic exercise for 3 months showed significantly lower (mean ± SD) weight (68.19±7.75 kg) compared to the weight (70.77± 7.82 kg) at baseline. Similarly, the patients after performing yogic exercise for 6 months (65.82±7.45 kg)

showed significant reduction ($p=0.000$) as compared to baseline weight as shown in

table 1 and figure 1.

Table 1: Weight of patients Before and After yogic exercise 40-60 yrs (Mean±SD)

Weight of patients		Mean	Mean diff	SD	p value
Before exercise vs After 3 months	Before exercise	70.77	2.58	7.82	0.002
	After 3 months	68.19		7.75	
Before exercise vs After 6 months	Before exercise	70.77	4.95	7.82	0.000
	After 6 months	65.82		7.45	

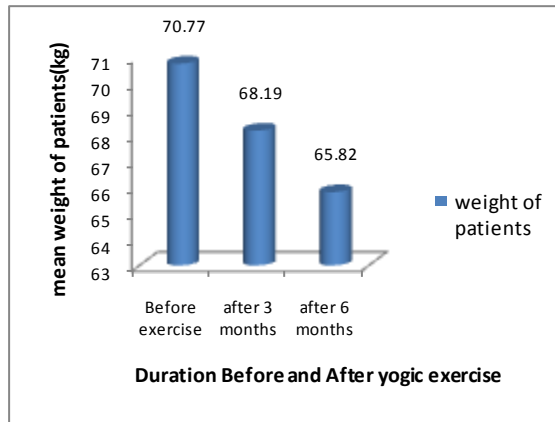


Figure 1: Mean weight of patients Before and After yogic exercise

Similarly, the BMI of patients after performing yogic exercise for 6 months showed significant reduction ($p=0.000$) as compared to baseline BMI.(table 2 and fig 2)

There is decrease in mean systolic as well as diastolic blood pressure of patients after 3 months of yogic exercise as compared to baseline systolic and diastolic blood pressure ($p=0.000$) similarly , blood pressure of patients after performing yogic exercise for 6 months systolic as well as diastolic showed significant reduction ($p=0.000$) as compared to baseline.(fig 3)

The patients after performing yogic exercise for 3 months showed significantly lower BMI) compared to that at baseline.

Table 2: BMI of patients Before and After yogic exercise 40-60 yrs (Mean±SD)

BMI(40-60yrs)		Mean	Mean diff	SD	p value
Before exercise vs After 3 months	Before exercise	25.96	0.88	4.01	0.020
	After 3 months	25.08		3.88	
Before exercise vs After 6 months	Before exercise	25.96	2.13	4.01	0.000
	After 6 months	23.83		3.7	

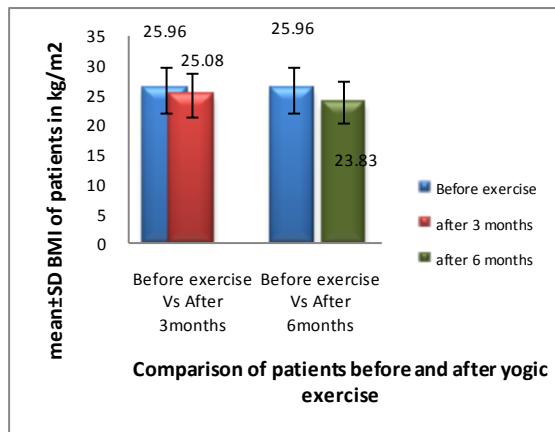


Figure 2: Comparison of BMI of patients before and after yogic exercise

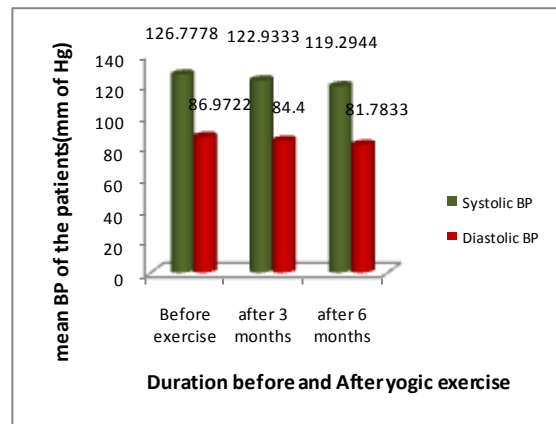


Figure 3: Mean Systolic and Diastolic Blood Pressure of patients Before and After yogic exercise

It is also found that as the duration of yogic exercise progresses from baseline towards 3 months and then 6 months there is significant decrease in the mean levels of parameters like weight, BMI and blood pressure.

DISCUSSION

In this study we analysed various parameters like weight, blood pressure and BMI before and after 3 and 6 months of yogic exercise (asanas and pranayamas) and observed the measurable improvement in all the parameters.

We observed significant reduction in weight & BMI after 3 and 6 months of yogic exercises. Similar findings were observed by Sahay (2007) [11]

We also observed measurable improvement in blood pressure. This finding is similar to previous reports saying that yogic practice has a beneficial role on cardiovascular system. Studies reported that long term as well as short term yogic practice decreased heart rate and blood pressure [12] reported that right nostril breathing (surya anulom vilom pranayama) decreases heart rate and blood pressure. Sudarshan kriya yoga was also found beneficial to decrease blood pressure [8] Savasana a relaxing technique have the ability to decrease heart rate, blood pressure. [13,14]

Addition to all above effects, following yoga-asanas and pranayamas, many patients reported a feeling of well being, more relaxed and satisfied, and a sense of relief from anxiety. They were more alert and active which could be due to release of opioids and altered adrenocortical activity. Yoga-asanas with its change in posture and controlled breathing in pranayama influences mental status of an individual allaying apprehension, stress and brings about feelings of well being and hormonal balance. [15-17]

CONCLUSION

There are significant benefits of yogic exercises on anthropometric measurements in patients having hypertension and obesity. In addition to normal medical therapy, Yogic exercises would give benefit to the patient and improve the status of patients in terms of use of less medicine, improvement of physical well being, improvement in mental alertness and activity and leading to complication free life. Long term yogic exercises are more useful than short term exercises.

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