

Influence of Yoga and Diet control in managing the state of Obesity

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Abstract

Background: Obesity is a risk factor for several diseases. The prevalence rate of obesity is being increasing. Yoga has been known to have stimulatory or inhibitory effects on the metabolic parameters and to be uncomplicated therapy for obesity. The purpose of the present study was to observe the effect of 6 weeks yoga and diet change program in obese women.

Material/Methods: A single group of 25 women were assessed on the first and last day of a yoga and diet change program, with 6 weeks of the intervention between assessments. The assessments were: body weight, skin fold thickness and cholesterol levels. Participants practiced yoga for 45 minutes every day and had a low fat, high fiber, vegetarian diet. First and last day data were compared using t-test.

Results: Following the 6-week Yoga and diet control program, participants showed a decrease in bodyweight, skin fold thickness and cholesterol levels of the subjects.

Conclusion: A 6-week yoga and diet change program decreased the bodyweight, skin fold thickness and cholesterol levels of the obese women. This suggests that a brief, intensive yoga program with a change in diet can pose certain risks.

Keywords: Obesity; Skin fold thickness; Cholesterol; Yoga; Kunjal; Agnisar; Sheetal; Bhastrika; Nadi-sodhan pranayama

Introduction

Obesity is among the most important causes of cardiovascular pathologies associated with endothelial dysfunction, such as arterial hypertension and atherosclerosis. Further, obesity is inadvertently associated with elevated plasma triglyceride levels, which is independently associated with an increased risk of CVD [1]. Obesity is increasing globally due to changing lifestyle with rapid urbanization. Regular practice of Yoga not only helps in better metabolism but it also regulates the digestive process. The better digestion, assimilation and ejection regulate the body physiology [2]. Yoga was developed in India to facilitate a vibrant lifestyle [3]. Currently, yoga is widely used to improve health and to attenuate or cure diseases. Asana, Pranayama and meditation as yoga practice emphasize in controlled breathing, meditation, and physical posture, respectively [4]. Asana uses various postures to develop physical strength, flexibility, and endurance [5], and can be used as a moderate-intensity exercise for patients with limited aerobic capacity or restricted ability to exercise [6]. Furthermore, yoga has been shown to decrease hypertension and cardiac inflammation, stabilize the sympathetic nervous

system, and improve psychological health and cardiac function [7-9].

A combination of yoga practices which emphasized breathing techniques was shown to reduce the body mass index (BMI) in 177 obese persons after 7 days of a yoga intervention [10]. Apart from yoga, a low-fat, low-energy, lacto-ovo-vegetarian diet combined with physical activity, and a stress-free environment have been shown to have a positive impact on risk factors for cardiovascular diseases, including the effect on BMI and total cholesterol [11]. Being overweight has several undesirable effects. For example, obese persons have been shown to have poor musculoskeletal fitness (based on push-ups, sit-ups, grip strength, and trunk flexibility), and this is of importance, as over a 20-year period musculoskeletal fitness is a significant predictor of weight gain [12]. Also, in people who are overweight, mobility is compromised, which is closely related to decreases in proprioception [13] and balance stability [14]. Postural instability in extremely obese persons has been shown to improve after a 3-week body weight reduction program [15].

Yoga as a lifestyle intervention: Yoga combines a healthy lifestyle with mental peace [16], and a modification in lifestyle and calming practices are shown to improve clinical profile of patients with various pathologies [17]. Regular practice of Pranayama and meditation in healthy volunteers led to an improved cardiovascular metabolic status [18,19], and lipid peroxidation even by a short term yoga based lifestyle intervention [20]. In a randomized controlled trial in patients with coronary atherosclerosis, a regression was observed in disease activity following a comprehensive lifestyle intervention [21]. In the study conducted by the same group, it has been shown that intensive lifestyle intervention may lead to regression of coronary atherosclerosis after one year and more regression of coronary atherosclerosis occurred after 5 years than after one year in the experimental group [22]. In a study conducted in India, the possible role of yoga-based lifestyle on retardation of coronary atherosclerosis disease was evaluated. At the end of one year, the yoga group showed significant reduction in number of angina episodes per week, an improved exercise capacity and a decrease in body weight. Serum total cholesterol, LDL cholesterol and triglyceride levels showed greater reductions as compared to control group [17]. Importantly, even short-term yoga based comprehensive lifestyle intervention led to notable reduction in body mass index, blood pressure, and blood glucose with a clinically meaningful improvement in lipid profile [23]. A significant decrease was also seen in body mass index and level of cholesterol in a study. This study shows that yoga practices has reducing impact on Body Mass Index (BMI) and cholesterol level of the obese youth [2]. A recent study suggested that a yoga-based, residential weight loss programme may foster psychological well-being, improved nutrition behaviours, and weight loss [24]. Similar reduction in weight was observed in another study that included an 8-week of yoga training that resulted in an improvement in body composition and total cholesterol levels in obese adolescent boys [25].

Effect of Yogic Intervention significantly reduces the General Body weight of the subjects: according to a study report [26] the study shows a significant reduction in the BMI and the level of cholesterol as well, because the intervention not only based on Asana Pranayama. It included the Shatkarma (the cleansing practice) as well. One of the study over Effect of Shatkarma practices on serum glucose and serum cholesterol level of the Human subjects shows a significant reduction in both the parameters [27]. The reduction in the cholesterol of the practitioners is due to better metabolism. One such study on the effect of Hath Yogic Practices on Body weight of the Human subjects shows a significant reduction in the subjects practicing Yoga [28].

Methodology

To observe the effect of Yogic Practice and diet control on skin fold thickness and cholesterol level of the Obese women, a six week study was conducted at urban area of the capital of the

India (New Delhi) and nearby areas (Gurgaon-Noida) commonly known as Delhi-NCR. For the study 25 female subjects with the age group 26 -35 years were selected randomly. In this study to observe the impact of yoga practices for 6 weeks the parameters were: skin fold thickness and cholesterol of subjects. Although it is considered to be a useful way to estimate healthy body weight, it does not measure the percentage of body fat.

Intervention: It was assumed that following Yoga practices and a moderate diet (low cholesterol, high fiber vegetarian diet) will help the subject to reduce the skin fold thickness and cholesterol level of the subjects. The Yogic intervention includes: Kunjal, Agnisar, Sheetal, Bhastrika and Nadi-Sodhan Pranayama.

Kunjal: is a Hath yogic cleansing technique, for that one need to intake warm salty water more than his capacity and vomit it voluntarily with the help of first two fingers pressing the tongue. Agnisar Kriya is also mentioned in Hath Yogic text as a cleansing practice, for that one need to exhale completely and shake the abdomen while keeping the chins locked in a seated posture. Sheetal Pranayama is a again Hath yogic breathing technique having cooling impact on the mind, for that one need to seat comfortably in a meditative posture, folding the tongue like a pipe and inhale slowly with the same, while exhalation will be normal (nasal). Bhastrika Pranayama is also one of the Hath Yogic breathing techniques having heating effect on the body. For that one need to seat comfortably in a meditative posture, start rapid inhalation and exhalation, perform it twenty times and thereafter exhale completely and hold the breath outside as per one's capacity. Nadi-Sodhan Pranayama is one of the breathing techniques having a balancing impact on our body and mind both. For that one need to seat comfortably in a meditative posture start alternate nostril breathing using your thumb and ring finger. Breathe normally and slowly. In this Pre- post study data were collected before and after intervention of yoga practices for 6 weeks (45 days). Paired t - test was applied for statistical analysis and p-value.

Procedure

With the background of previous studies the following procedure has been applied as Yogic intervention:

Kunjal: twice in a week

Agnisar: three rounds daily

Sheetali: five rounds daily

Bhastrika: three rounds daily and

Nadi-Sodhan Pranayama: five rounds daily.

A moderate low cholesterol, high fiber, vegetarian diet has been prescribed to the subject of practice group whereas no modification has been suggested in the subjects of control group.

Results

Results are shown in Tables 1-4 and Graphs 1-4.

Table 1: showing the BMI level of the subjects.

Group	Test	N	Mean	SD	r	Sed	df	t	significance
Female	Pre	25	32.39	1.33	.60	.33	24	5.17	<.01
	Post	25	30.72	2.02					

Table 2: showing the body weight in Kilogram (kg) of the subjects.

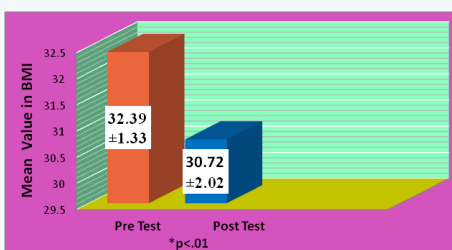
Test	N	Mean	SD	r	Sed	df	t	significance
Pre	25	96	9.31	.99	.20	24	8.77	<.01
Post	25	94.28	9.26					

Table 3: showing the skin fold thickness (in mm) of the subjects.

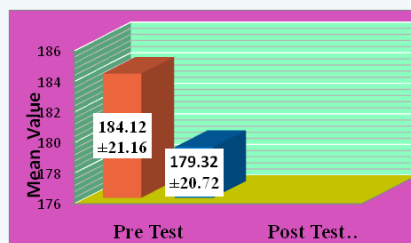
Test	N	Mean	SD	r	Sed	df	t	significance
Pre	25	54.04	10.98	0.99	.31	24	9.87	<.01
Post	25	51.36	10.99					

Table 4: showing the Blood cholesterol level (in mg/dl) of the subjects.

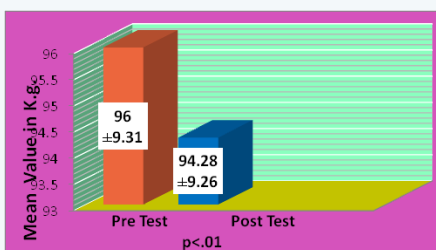
Test	N	Mean	SD	r	Sed	df	t	significance
Pre	25	184.12	21.16	.99	.58	24	8.52	<.01
Post	25	179.32	20.72					



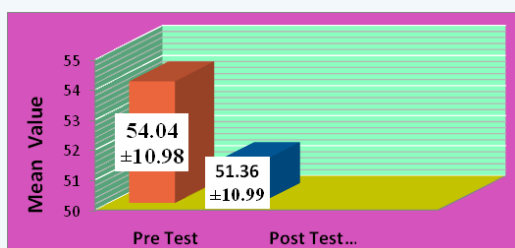
Graph 1: showing the BMI level of the subjects.



Graph 4: showing the blood cholesterol level (in mg/dl) of the subjects.



Graph 2: showing the body weight in Kilogram (kg) of the subjects.



Graph 3: showing the skin fold thickness (in mm) of the subjects.

Discussion

Present study shows a significant reduction in the cholesterol level, bodyweight and skin fold thickness, in the practice group of the obese women in compare to the control group. The above result is a reflection of body weight reduction in the Yoga practitioners. As practice of Yoga increase the physical activity which increase the metabolism rate of the body. A yoga-based lifestyle intervention is efficacious in weight-loss [29], and it also prevents weight-gain, especially amongst those who are overweight [30].

This study also shows a significant reduction in Cholesterol level of the practice group of the women subjects. This may be due to the low cholesterol, high fiber vegetarian diet. Similar benefit was observed in another study where yoga improved adiponectin level, serum lipids, and metabolic syndrome risk factors in obese women [31]. The intervention also includes a moderate diet (low cholesterol – vegetarian diet), which also has an impact on weight loss as well as in reduction of cholesterol

level of the subjects. One of the studies also has the same impact as a diet- induced weight loss [32].

Conclusion

A 6 week practice of yoga and diet change which included 45 minutes of daily yoga practice (including Kunjal, Agnisar, Sheetal, Bhastrika and Nadi-Sodhan Pranayama) and a high fiber vegetarian diet showed a decrease in the body weight, BMI, skin fold thickness and, total cholesterol, in practice group of obese women in comparisons to the control group. The long term impact of the intervention remains to be studied.

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