

# Comparative Clinical Evaluation of Yogic Practices and Apamarga Tandula (Seeds) along with their Additive Effect in Sthaulya (Obesity)

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## Abstract

**Background:** In Indian classical text of Ayurveda and Yoga, there has been many indication given for sthaulya. After literature review, the Apamarga tandula and yogic practices were found as medohar (anti-obesity) agents.

**Objective:** The present study was conducted to assess the individual as well as synergistic effect of yogic practices and Apamarga Tandula Ksheer-pak in Sthaulya.

**Materials and Methods:** This study was carried out in Department of Dravyaguna, Sir Sundarlal Hospital, I.M.S., B.H.U., Varanasi. 160 patients of obesity were randomized into four groups, group-I (control), group-II (yogic practices daily for 1 hour), group-III (Apamarga Tandula Ksheer-pak treatment group) and in group-IV (yogic practiced daily for 1 hour along with Apamarga Tandula Ksheer-pak treatment). All the groups were followed up for 3 months. BMI and lipid profile of the groups were compared at the end of 3 months with SPSS tool (version 16).

**Results:** Analysis of data after treatment of 3 months in all three groups (II, III, IV) of the study showed significant decrease in weight, BMI, total cholesterol, triglycerides and LDL, VLDL along with significant improvement in HDL.

**Conclusion:** At last the trial group-IV exhibits more therapeutic efficiency over group-II and III.

**Keywords:** Apamarga Tandula, BMI, Obesity, Sthaulya, Weight, Yoga

## Introduction

Obesity means “abnormal or excessive fat accumulation that presents a risk to health”. For adults, Obesity ranges are determined by using weight & height to calculate the body mass index. Obesity results from an energy imbalance due to eating too many calories and not doing enough physical activity to use up the calories. Consensus Guidelines for Asian Indians defines a BMI  $\geq 25$  as obesity.<sup>1</sup> 44% of the diabetes burden, 23% of ischaemic heart disease burden and 7%-41% of certain cancer burden are attributable to obesity.<sup>1</sup> In Ayurvedic classics, there is a detailed description about Sthaulya. It is one of the eight types of denigrated persons. Along with causes and symptoms, these classics

have mentioned line of treatment and herbs to combat with Sthaulya or obesity.

Apamarga is one of the herbs described for Sthaulya. In Charak Samhita, it is said as herb to pacify the hunger.<sup>3</sup> While in Nighantus, the properties of Apamarga is told as Deepan, Pachana and Kapha- mado-hara.<sup>4,5</sup> Apamarga is botanically identified as *Achyranthes aspera* L. and is commonly found in all over India.<sup>6</sup> Though almost all of its parts are used in traditional systems of medicines, seeds are used for obesity.

Yoga, the science practiced in India over thousands of years, produces consistent physiological changes. It has

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been proved that Pranayam and certain Asanas are very important means for preventing and curing many ailments. Recent research studies have shown that the practice of Yoga improves strength and flexibility and may help in control parameters as blood pressure, respiration & heart rate, metabolic rates etc. The present study was undertaken to assess the individual as well as synergistic effect of selected yogic practices and Apamarga on the weight, BMI and lipid profile in patients with Sthaulya.<sup>7</sup>

## Material and Methods

The present study was undertaken at Department of Dravyaguna, Faculty of Ayurveda, I.M.S., B.H.U., Varanasi from 1<sup>st</sup> September, 2016 – 30<sup>th</sup> November, 2017. Patients were diagnosed for obesity based on Body mass index and clinical symptoms. Ethical approval was obtained from Institute Ethical Committee, IMS, BHU. All the consecutive participants had given their informed and written consent for the study. Consent form was in bilingual language (Hindi and English).

### Inclusion Criteria

- Age group of 40-50 years of either sex
- BMI  $\geq 25$  kg/m<sup>2</sup>
- Patients complaining of symptoms of Sthaulya/obesity.
- Patients willing to participate and giving written consent for the study

### Exclusion Criteria

- Hypothyroidism, hypertension and diabetes mellitus
- Any concomitant serious disorder of the liver, kidney, heart, lungs or other organs
- Pregnancy and lactation
- Patients undergoing treatment or any other serious illness

The present study was conducted on 160 patients and randomly divided into four groups.

Sample size was calculated on the basis of previous related studies.

**Table 1. Information about the grouping and number of patients in each group**

Group-I	Group-II	Group-III	Group-IV
Control group	Instructed to do yoga practices	Apamarga Tandula Ksheer-pak	Yoga practices along with Apamarga Ksheer-pak
n=40	n=40	n=40	n=40
Number of participants who were lost during follow-up of 3 months			
n=4	n=3	n=5	n=2
Number of patients who had completed the course (3 months) of study and analyzed			
n= 36	n=37	n=35	n=38

It was individual as well as comparative study so four groups have taken.

## Trial Drugs and Doses

After identification from the Department of Dravyaguna, Faculty of Ayurveda, I.M.S., B.H.U., Varanasi, Apamarga tandulasa (having Tikta- rasa, Laghu-Ruksa guna, Ushna virya, Katu vipaka which is Kaphapittashamaka) was given to the patients in amount of 500 g in sealed packets. Patients were instructed to make ksheer-pak of the drug by boiling 10 g seeds in 80 ml of cow milk with 320 ml of water till remain of 80 ml of milk and advised to take it twice in a day till 3 months. Standards of purity, quality and packing were maintained.

## Follow-up

Follow-up was carried out at 3 months. Patients of group II and group- IV daily came for yogic practice, up to three months for one hour at 6:00-7:00 am. Rest other groups were visited (informed by telephonic calls) to the research centre of IMS, BHU for their respective before and after treatment parameters analysis.

## Protocol of Yogic practices

Yogic practices	60 Minutes
Prayer	2 min
Sukshma practices	6 min
Asanas	20 min
Hastpadasan	2 min
Trikonasanaan	2 min
Yoga Mudrasana	2 min
Paschimottasana	2 min
Bhujangasan	2 min
Uttanpadasana/Ardha-Halasan	2 min
Nukasana	1 min
Pavanamuktasana	2 min
Shavasana	5 min
Pranayama	25 min
Bhastrika	3 min
Kapalabhati	15 min
Anulomaviloma	5 min
Bhramri	2 min
Meditation	5 min
Prayer	2 min

## Data Analysis

By using SPSS tool (version16), Paired t- test was used to know the significant difference within the groups and one way ANOVA followed by Post-Hoc test were used to find out significant difference between the groups.

## Results

To analyse the effect of Apamarga Ksheer-pak and yogic exercise after three months of treatment, paired t-test was applied. The obtained results were interpreted as, insignificant  $p > 0.05$ , significant  $p < 0.01$  and highly significant  $p < 0.001$ .

The reliable among them were BMI and lipid profile. The trial patients were randomly divided into four groups as mentioned above and results were mentioned timely.

In Group I (control group), there were significant increase in weight and BMI with  $p=0.021$  and  $p=0.043$  respectively in 3 months of follow-up while no significant change in lipid profile values as described in Table 1.

In Group II, there were significant decrease in weight (7.88%;  $p<0.001$ ), BMI (7.91%;  $p<0.001$ ), total cholesterol (9.49%;  $p<0.001$ ), LDL (11.02%;  $p<0.001$ ), VLDL (14.22%;  $p<0.001$ ), TG (15.78%;  $p<0.001$ ) and significant increase in

HDL (16.06%;  $p<0.001$ ) as shown in Table 2.

In Group III, there were significant decrease in weight (4.14%;  $p<0.001$ ), BMI (4.12%;  $p<0.001$ ), total cholesterol (10.81%;  $p<0.001$ ), LDL (12.37%;  $p<0.001$ ), VLDL (22.59%;  $p<0.001$ ), TG (24.43%;  $p<0.001$ ) and significant increase in HDL (17.79%;  $p<0.001$ ) as shown in Table 3.

In Group IV, there were significant decrease in weight (9.44%;  $p<0.001$ ), BMI (9.51%;  $p<0.001$ ), total cholesterol (15.21%;  $p<0.001$ ), LDL (22.55%;  $p<0.001$ ), VLDL (35.48%;  $p<0.001$ ), TG (32.54%;  $p<0.001$ ) and significant increase in HDL (32.74%;  $p<0.001$ ) as shown in Table 4.

**Table 1. Comparison of initial values and follow-up parameters of the Group-I (control group)**

Variable	Initial (Mean±SD)	Follow up (Mean±SD)	% Change	p-value
Weight	85.84 ± 9.562	86.69 ± 9.659	0.99 ↑	0.021
BMI	32.56 ± 3.194	33.14 ± 3.441	1.05 ↑	0.043
Total cholesterol	226.85 ± 15.254	227.43 ± 19.301	0.02 ↑	0.098
HDL	37.3 ± 3.764	36.57 ± 3.096	1.23 ↓	0.442
LDL	146.08 ± 12.575	148.49 ± 11.978	1.73 ↑	0.156
VLDL	43.56 ± 5.401	43.94 ± 5.286	0.86 ↑	0.676
Triglyceride	217.78 ± 270.4	219.72 ± 26.429	0.89 ↑	0.764

**Table 2. Effect of yogic practices in Group-II**

Variable	BT (Mean±SD)	AT (Mean±SD)	% Change	p-value
Weight	86.18 ± 9.484	78.92 ± 8.552	7.88 ↓	<0.001
BMI	32.83 ± 2.391	30.23 ± 1.997	7.91 ↓	<0.001
Total cholesterol	232.98 ± 20.089	210.28 ± 19.892	9.49 ↓	<0.001
HDL	35.8 ± 5.170	41.58 ± 4.305	16.06 ↑	<0.001
LDL	149.35 ± 15.328	132.69 ± 13.652	11.02 ↓	<0.001
VLDL	44.08 ± 6.954	37.81 ± 5.929	14.22 ↓	<0.001
Triglyceride	220.41 ± 34.769	189.05 ± 29.647	15.78 ↓	<0.001

**Table 3. Effect of Apamarga Tandula ksheer-pak in Group-III**

Variable	BT (Mean±SD)	AT (Mean±SD)	% Change	p-value
Weight	86.46 ± 11.327	82.49 ± 10.810	4.14 ↓	<0.001
BMI	32.67 ± 2.272	31.32 ± 2.245	4.12 ↓	<0.001
Total cholesterol	228.85 ± 13.057	201.78 ± 10.483	10.81 ↓	<0.001
HDL	36.85 ± 2.975	43.42 ± 2.454	17.79 ↑	<0.001
LDL	150.80 ± 10.5888	130.67 ± 9.654	12.37 ↓	<0.001
VLDL	43.14 ± 4.167	32.60 ± 4.320	22.59 ↓	<0.001
Triglyceride	215.71 ± 20.833	163.00 ± 21.598	24.43 ↓	<0.001

**Table 4. Synergistic effect of Apamarga Tandula ksheer-pak and yogic practices in Group-IV**

Variable	BT (Mean±SD)	AT (Mean±SD)	% Change	p-value
Weight	85.72 ± 9.626	77.63 ± 8.368	9.44 ↓	<0.001
BMI	32.94 ± 2.904	29.8 ± 2.019	9.51 ↓	<0.001
Total cholesterol	230.62 ± 20.060	195.43 ± 15.321	15.21 ↓	<0.001
HDL	36.12 ± 4.386	47.51 ± 5.090	32.74 ↑	<0.001

LDL	148.58 ± 18.670	114.29 ± 11.891	22.55 ↓	<0.001
VLDL	42.95 ± 6.686	29.00 ± 4.932	35.48 ↓	<0.001
Triglyceride	214.74 ± 33.429	145.00 ± 24.660	32.54 ↓	<0.001

## Discussion

Obesity is a serious global epidemic and possesses a significant health threat to human. The prevalence of obesity is increasing in adults. It is associated risk for atherosclerotic cerebrovascular disease, coronary heart disease, colorectal cancer, hyperlipidaemia, hypertension, gall bladder disease and diabetes mellitus as well as a higher mortality rate. Although the causes of obesity are multitudes and the aetiology are not well known, obesity is at least in part attribution to overconsumption of calorie-dense food and physical inactivity.

Weight and BMI was significantly decreased with 7.88% and 7.91% in group II; 4.14% and 4.12% Group III; 9.44% and 9.51% in Group IV. This shows that there is synergistic effect of yogic practices and Apamarga Tandula and therefore, there is maximum decrease in weight and BMI in group IV compare to other treatment groups.

HDL was significantly increased with 16.06% in Group II, 17.79% in Group III and 32.74% in Group IV while there was significantly decreased in TG with 15.78% in Group II, 24.43% in Group III, 32.54% in Group IV respectively. There is significant increase in HDL and decrease in TG in Group IV compared to other treatment groups. Therefore, this shows that yogic practices and Apamarga Tandula has role in controlling dyslipidaemia.

On review of classical literature of Ayurveda, Apamarga Tandula (seed) is found to have significant place for therapeutic use in Sthaulya. It is experimentally proven that saponins of Apamarga seeds possess hypolipidemic properties showing hypotriglyceridaemic or hypocholesterolaemia effects without any detectable side effects on liver and cardiac functions. It has established as effective anti-dyslipidaemic, anti-hypertensive and anti-hyperglycaemic agent as the drug have produced statistically significant improvement in the clinical manifestations, anthropometric profile & also reduction in lipid profile.<sup>8</sup>

HDL is good cholesterol and due to its effectiveness in cholesterol removal from the periphery to liver (reverse cholesterol transport). Drugs probably inhibit an enzyme in the liver that is involved in triglyceride synthesis, causing a decrease in VLDL production. It in turn leads to reduction in free fatty acids in the visceral fat levels, and thereby improvement in the HDL levels.<sup>9</sup>

Yoga practices has been known in weight and BMI reduction with increase energy and calorie expenditure. The improvement in lipid profile with practice of yoga could be due to increased hepatic lipase and lipoprotein lipase.

This would increase the uptake of triglycerides by adipose tissue and affect the lipoprotein metabolism.<sup>10</sup>

## Conclusion

The present study has shown an efficacy of improving the dyslipidemia in Sthaulya. While yoga and certain asanas have shown significant decrease in BMI, both systolic and diastolic blood pressure on practicing three months. It also has beneficial effect on lipid profile. The Apamarga Tandula Ksheer-pak becomes more effective when given along with yogic exercise.

## Abbreviations

- BMI: Body Mass Index
- HDL: High Density Lipoproteins
- LDL: Low Density Lipoproteins
- VLDL: Very Low Density Lipoproteins
- TG: Triglycerides
- BT: Before Treatment
- AT: After Treatment
- SPSS: Statistical Package for the Social Sciences

**Conflict of Interest:** None

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