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Effect of *Paschimottanasana* in Metabolic Disorder w.s.r. to *Sthaulya*

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ABSTRACT

INTRODUCTION: Obesity (*Sthaulya*) is defined as a condition of extra fat accumulation in adipose tissue, to the extent that health may be impaired. In today era, due to sedentary life style, person has got many metabolic disorders for themselves and *Sthaulya* (Obesity) is one among them. **STUDY TYPE:** This study was randomized prospective clinical trial. **AGE GROUP:** Individuals of either sex aged between 18-50 years. **MATERIALS AND METHODS:** Total 25 patients of *Sthaulya* fulfilling the inclusion and diagnostic criteria were selected from O.P.D., I.P.D. & Yoga Unit of National institute of Ayurveda (NIA) Hospital, Jaipur, Rajasthan. In this study, the investigator's objective was to evaluate the effect of *Paschimottanasana* in the management of *Sthaulya* (Obesity). The efficacy was determined by the compare between the baseline data and after treatment data. **RESULTS AND CONCLUSION:** *Pashimottanasana* showed maximum percentage relief in Subjective, Objective parameter except *Alasya*, *Atipipasa* & *Atikshudha*. *Paschimottanasana* showed higher percentage relief in all Anthropometric Profile (Weight, BMI, Waist, Hip, Mid-Thigh Circumference etc.). *Paschimottanasana* process results in reducing the objective as well as subjective complaints by enhancing the metabolic activities and imparting the massing effect over the various body parts.

KEYWORDS

Sthaulya, Obesity, *Paschimottanasana*, Metabolic disorders.



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INTRODUCTION

In recent years, health levels are decreasing due to changing of life style, diet pattern behavioural pattern and mental stress and strain. Everyone is susceptible to multiple illnesses owing to the modification of our ordinary digestion physiology. Due to this sedentary life style, person has got many metabolic diseases for themselves. Obesity is one among the major diseases of modern era. Obesity is a blessing from the modern age of machinery and materialism. Industrialization, stress during job, dietary habits, absence of workout & multiple varieties among the daily diet e.g. quick food, freezing fruits, enhanced quantity of soft drinks and beverages, canned food outcomes in the clinical entity that we can call obesity. Obesity is the one of the disease which is gaining more and more attention of scientists at global level. Many organizations and medical schools are making attempts to find a perfect remedy for this burning issue. Obesity is the ailments which has mere resemblance with *Sthaulya* which has been explained comprehensively in *Ayurvedic* excellence. *Paschimottanasana* or sitting forward bending posture is a technically intense western stretch, as *Paschima* means west in *Sanskrit* and *Uttana* means intense stretch. *Paschimottanasana* decreases obesity and

fat in the abdomen. *Paschimottanasana* soothes your brain and relieves stress, as well as mild depression. This asana completely extends your spine, shoulders and hamstrings. It stimulates your liver, kidney, uterus, and ovary. It enhances digestion.

NEED OF STUDY

Obesity and overweight present a significant danger to severe diet-related chronic disease, including type-2 diabetes, cardiac disease, hypertension & stroke, and certain types of cancer. The health effect ranges from enhanced danger of premature death to severe chronic condition that reduces the general quality of life. There are so many medicines in market regarding obesity. But there are no satisfactory results even they have lot of side effects. So there is need to control the disease by natural therapy.

MATERIALS AND METHODS

In the study, the investigator's objective was to evaluate the effect of *Paschimottanasana* in the management of *Sthaulya* (Obesity). The efficacy was determined by finding out the difference between the baseline data of the parameters to the after treatment data.

STUDY DESIGN

Type of study



This study was randomized prospective clinical trial. In a clinical therapeutically trial, the patient, the treatment and the parameters for evaluation of result are important components.

Type of trial methodology

Trial adopted for the study was open trial.

SOURCES OF DATA

A Patient suffering from *Sthaulya* fulfilling the inclusion and diagnostic criteria were selected from O.P.D., I.P.D. & Yoga Unit of National Institute of *Ayurveda* (NIA) Hospital, Jaipur, Rajasthan. A total 30 patients were registered for the current trial. Out of them, 5 cases dropped out from the study and the study was completed 25 cases.

INCLUSION CRITERIA

- Patients aged between 18 to 50 years.
- Patients BMI in between 25 to 40 kg/m²
- Patients having clinical signs and symptoms of *Sthaulya*.
- Patients should not on any others medicines for *Sthaulya*.
- Patients willing to sign the consent form.

EXCLUSION CRITERIA

- Age below 18 years and more beyond 50 years.
- BMI less than 25kg/m² and more than 40kg/m².
- Neuro Endocrine disorders.
- Genetic Syndromes.
- Drug induced Obesity.

➤ Chronic systemic problems like Diabetes Mellitus.

➤ Patients with severe Hypertension.

➤ Patients with Hypothyroidism.

➤ Patients with evidence of renal, hepatic and cardiac involvement.

➤ Patients with long term Steroid treatment.

➤ Pregnant women.

DIAGNOSTIC CRITERIA

➤ It was mainly based on the specially prepared proforma, including all clinical signs and symptoms of the disease in which detailed history was taken and physical examination was done.

➤ Moreover, the value of BMI, circumferences was also used as diagnostic criteria.

Patients were carefully examined both subjectively and objectively. Detailed history pertaining to the mode of onset, previous treatment history, family history, *Astavidha Pareeksha* etc. and physical examination findings were maintain systematically. An area based specific research performa was also designed by using *Ayurvedic* as well as modern parameters and all the above data were noted down.

PLAN OF STUDY

Before starting main process, patients were asked to do warm up exercises. After completion of main process each patient is



advised to do *Shavasna* for few minutes. The *asana* was done for 3 to 5 minutes and every time 6 to 10 rounds of *Asanas* were performed. For beginners it was according to their strength and capacity. Holding time of the final step proper was being up to 30 seconds. After the completion of *Paschimottanasana*, patients were asked to do its counter pose *Ustraasna*.

Duration: 3 months

Practice was being done in early morning with empty stomach.

Follow up study: Once in every 15 days.

EXAMINATION OF PATIENTS

All the O.P.D. patients were asked to report on every 15th day to access the variations in symptomatology during the *Yoga* therapy.

ASSESSMENT CRITERIA

For assessing the variables, patients were examined every 15 days, the suitable scoring method and objective signs were recorded. After completion of 3 month duration *Yoga* therapy, the efficacy of therapy was assessed on the basis of following subjective as well as objective criterion.

SUBJECTIVE CRITERIA

To assess the improvement in clinical symptomatology of the patients, scoring system was adopted. Symptoms were accorded grades according to their severity.

1. OBJECTIVE CRITERIA

Cardinal measures

1. Weight

2. BMI

CIRCUMFERENCE

MEASUREMENTS—for the present study the girth measurements of certain regions using measuring tape before and after the treatment will also carried out. The girth measurement of following areas where generally the adiposity is found more was taken:-

1. Waist – At the level of umbilicus.

2. Hip - At the level of highest point of distension of buttock.

3. Mid-Thigh Circumference.

SKIN FOLD THICKNESS -

1. Mid Biceps

2. Mid Triceps

3. Supra Iliac Region

4. Sub-scapular Region

In case of all circumference measurements, the mean values were taken before and after treatment. The body weight was also taken before and after treatment.

ASSESSMENT GRADATION

The suitable scoring method for signs and symptoms were recorded in following patients.

Present / absence of symptoms	-	
	0	
Mild	-	1
Moderate	-	2
Severe	-	3
Very severe	-	4



***Paschimottanasana* (back stretching pose)**

Having stretched the feet like a stick on the ground and grasped the toes of both feet with both hands, when one sits on the thighs with his forehead, it is called *Paschimottanasana*¹

इति पश्चिमतासनाग्र्यं पवनं पश्चिमवाहिनं करोति।
उदयं जठरानलस्य कुर्याद् उदरे काश्यमरोगतां
च पुंसाम्॥३१॥ (ह.यो.प्र. 1/31)

This *Paschimottanasana* carries the air from the front to the back of the body (i.e. to the *Susumna*). It kindles gastric fire, decreases obesity, and cures all men's illnesses.

PROCEDURE

Starting position: *Dandaasana*

Start to inhale; sitting on the floor with outstretched legs that are held together by feet and holding hands on the knees. Relaxing the whole body should be called *Dandaasana*.

Further, with slow exhalation forward bend from the hips is made with sliding the hands down the legs and big toes grasped with the fingers and thumbs. If that is not possible, heels, ankles or any other part of the legs can be held that can be reached comfortably. Slow steps are done without jerks. This position is retained for a few seconds. Inhalation is done in the static position. Muscles of the back and legs are

relaxed and gently stretched. Legs are kept straight. Elbows are bent utilizing the arm muscles and trunk is brought down towards the legs. Knees are to be touched with the forehead. This is the final position, retained for as long as the person is comfortable. Slow and deep breathing is done in this position. With inhalation slow return to the starting position is made.

AWARENESS

Physically- on the abdomen, relaxation of the back and leg muscles, slow breathing
Spiritually- on *Swadhishthana Chakra*

CONTRAINDICATIONS: sciatica, hernia, slipped disc

MOVEMENTS IN THE JOINTS

Flexion of the spine; sacrum nutation; flexion of the hip, adduction, internal rotation; extension of the knee; slight dorsiflexion of ankle; scapula abduction and upward rotation; glenohumeral joint flexion, slight external rotation, adduction; elbow extension; forearm slight pronation.

WORKING

Gravity pulls the torso towards the top of the thighs.

- Spine: extensors deepen the actions in hip joints
- Legs : *Vastii* and *articularis genus* extend the knees

LENGTHENING OF THE MUSCLES



- Spine: spinal extensors (while releasing into pose), latissimus dorsi
- Legs: hamstrings, gluteus maximus, piriformis, obturator internus and gemelli, gluteus medius and minimus, gastrocnemius and soleus; popliteus prevents hyperextension of the knees
- Arms: rhomboids, lower trapezius, latissimus dorsi

Obstacles encountered like tightness in the hamstrings and gluteus maximus will restrict flexion of the hip, the hip flexors and abdominal muscles may contract to achieve the forward bend. Therefore, in this situation, a folded blanket under the ischial region can be put to elevate the seat and thence gravity will draw the upper body to the forward more easily. Also, this allows the spine to come more forward and puts less stress on the hamstrings.

Table 1 clinical improvement profile

S.No.	Lakshana	Mean			Relief %	S.D.	S.E.	“t”	“p”	Result
		BT	AT	X						
1	<i>Chala Sphika Udara Stana</i>	1.64	1.08	0.56	34.14	0.583	0.116	91	0.001	H.S
2	<i>Alasya / Utsahahani</i>	1.6	1.24	0.36	22.50	0.4899	0.097	45	0.003	H.S
3	<i>Nidradhikya</i>	1.60	1.36	0.24	15	0.435	0.087	21	0.03	S
4	<i>Swedadhikya</i>	1.80	1.56	0.24	13.33	0.435	0.087	21	0.03	S
5	<i>Daurgandhya</i>	1.48	1.28	0.20	13.51	0.408	0.081	15	0.06	S
6	<i>Ati Pipasa</i>	1.16	0.88	0.28	24.13	0.45	0.091	28	0.01	S
7	<i>Ati Kshudha</i>	1.16	0.88	0.28	24.13	0.541	0.108	21	0.03	S
8	<i>Anga-Gaurava</i>	1.6	1.120	0.48	30	0.65	0.1306	55	0.002	H.S

IMPORTANCE OF BREATHING WHILE PERFORMING THE ASANA:

Process of exhalation when initiated with the lower abdominal muscles, deepens the pelvic flexion while action of the inhalation when directed towards the rib cage, helps in extension of the upper spine.

RESULTS

A total of 30 patients were registered from the O.P.D. and I.P.D., Department of *Swasthavritta* and *Yoga*, National Institute of Ayurveda (NIA) Jaipur, Rajasthan. Out of 30 subjects, 5 cases did not return for further follow up treatment and study was completed 25 cases. Out of them, 25 cases were selected for the present study. Under this study, 08 sign and symptoms were assessed before and after treatment.



Significant results were shown in grading parameters of *Nidradhikya*, *Swedadhikya*, *Daurgandhya*, *Ati Pipasa* and *Ati Kshudha* while highly significant results were found in *Chala Sphika Udara Stana*, *Alasya / Utsahahani* and *Anga Gaurava*. (**Table 1**)

Table 2 anthropometric improvement profile

S.No.	Lakshana	Mean			Relief %	S.D.	S.E.	“t”	“p”	Result
		BT	AT	X						
1	Body Weight	81.88	77.08	4.8	5.86	1.555	0.310	15.438	0.0001	E.S
2	BMI	29.57	27.83	1.73	5.85	0.561	0.112	15.46	0.0001	E.S
3	Waist Circumference	36.2	35.32	0.88	2.4	0.781	0.1562	5.634	0.0001	E.S
4	Hip Circumference	40.96	39.76	1.2	2.92	0.645	0.129	9.295	0.0001	E.S
5	Mid-Thigh Circumference	61.72	60.44	1.28	2.07	1.27	0.255	5.018	0.0001	E.S
6	Mid Biceps	26.16	25.44	0.72	2.75	0.979	0.196	3.674	0.001	H.S
7	Mid Triceps	33.92	31.68	2.24	6.6	5.637	1.127	1.987	0.004	H.S
8	Supra Iliac Region	46.16	45.04	1.12	2.42	1.166	0.233	4.8	0.0001	E.S
9	Subscapularis	42.48	41.6	0.88	2.07	1.013	0.202	4.342	0.0002	E.S

Highly significant results were shown in reducing mid biceps and mid triceps while extremely significant results were found in rest of the parameters. (**Table 2**)

DISCUSSION

Probable mode of action of the therapy

Yoga is a way of life predominantly concerned with maintaining a state of equanimity at all costs. It gives steadiness and health to the individual's physical, mental, emotional and spiritual aspects. *Yoga* consists of eight limbs i.e *Yama*, *Niyama*, *Asana*, *Pranayama*, *Pratyahara*, *Dharana*, *Dhyana*, and *Samadhi*².

Yoga practice helps in revitalizing the body that has been in inactive mode due to obesity. *Yoga* plays significant assignment in refinement of the body toxins and reduces fatigue. *Yogic* technique help to

smoulder up excess fat, recover metabolism, tone up muscles and facilitate the practitioner to enjoy a healthy life. The Study indicates that the entire abdominal muscle work during yogic practice was five times higher than the job during abdominal crunches. Because of high muscle activity, this form of practice would be good for people who cannot readily exercise on the ground like obese people³. Lorenzo A Gordon et al (2008) has demonstrated the efficacy of *Hathayoga* exercise on blood glucose, lipid profile, oxidative stress markers and antioxidant status in patients with type 2 diabetes, obesity and suggested that *Hathayoga* exercise and conventional



physical training exercise may have therapeutic preventive and protective effects on diabetes mellitus and obesity by decreasing oxidative stress and improving antioxidant status⁴.

This asana extends the muscles of the hamstring and improves flexibility in the hip joints. It tones and massages the entire abdominal and pelvic region, including the liver, pancreas, spleen, urogenital system, kidneys, and adrenal glands, thus helping to remove excess weight in this area and stimulating circulation to the spine's nerves and muscles.

This asana holds the air from the front to the back of the body (i.e. to the *Susumna*). It kindles gastric fire, decreases obesity, and cures all men's diseases⁵.

As it decreases the amount of fat accumulated in various body parts therefore the symptom *Chalaspikudarastana* is relieved by practising this asana. *Meda Dhatu* is the main *Dhatu* vitiated in *Sthaulya Roga* which when corrected by *Paschimottanasana* causes the symptom of *Swedadhikya* to get relieved, *Sweda* being the mala of *Meda Dhatu*. *Sweda* being the causative factor for *Daugandhya* relieves the symptom of *Daugandhya* upon its own alleviation. *Nidra* is caused by dominance of *Kapha* and *Tama Doshas*, *Meda*, *Kapha*, and *Tama* are interrelated to each other;

hence *Meda* reduction tends to relieve the symptom of *Nidradhikya* in obese patients.

Paschimottanasana is considered to be one of the most venerable *Yogic* technique and most of the traditional texts accentuate its ability to improve metabolism thus helping to keep away from several metabolic disorders principally obesity⁶.

Final posture attained during the *Paschimottanasana* imparts strong contraction and massaging effect over the abdominal muscle, this effect may help to liquefy the fat mass deposited around the waist region, hip region, supra iliac spine, triceps, Biceps, shoulder and sub scapular region.

Sitting in this posture even imparts massaging effect over the abdominal vital organs viz, liver, spleen, pancreas and gastric region which may enable the proper enzymatic and gastric secretion it in turn ignites the digestion and metabolism process.

Sitting in *Paschimottanasna* also enables proper and high circulation to abdominal muscles and helps to take out the deposited toxins (bad fat).

CONCLUSION

Obesity is a metabolic disorder. So without improving metabolism the proper food intake has very limited role. So that type of



therapy should be recommended which pacify these factors. Also, *Paschimottanasana* acts on metabolism of the body and helps in reducing the body fat of a particular area i.e. supra iliac region, buttocks, thighs and abdominal fat etc. *Pashimottanasana* showed maximum percentage relief in Subjective, Objective parameter except *Alasya*, *Atipipasa* & *Atikshudha*. *Paschimottanasana* showed higher percentage relief in all Anthropometric Profile (Weight, BMI, Waist, Hip, Mid-Thigh Circumference etc.). The *Paschimottanasana* process results in reducing the objective as well as subjective complaints by enhancing the metabolic activities and imparting the massing effect over the various body parts. The plus point observed in case of *Yogic* technique management is absence of any hazardous effect, which is really a great benefit to the patients and is of vital importance in view of the global acceptance of *Yoga*.

Limitations -

The sample size was small; the follow up period was short as the study was time bound.

Recommendations –

Large sample study can be conducted. Various studies shows *Pranayama* has better role in improving metabolic disorder than *Asanas*

The therapeutic effect can be enhanced significantly when there should be incorporation of various *Yogic* exercises like *Surya Nmaskar*, *Chakrasana*, etc along with the proper diet regimen.



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