

**EVALUATION OF *MEDADUSTI* IN *STHAULYA* IN LIGHT OF *SAT KARYA VADA* AND ITS MANAGEMENT WITH *VARUNADI KASHAYAM***Bijita Majumder<sup>1</sup>, [Sukalyan Ray](#)<sup>2</sup>

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**Article Received:** 30/05//2022 - **Peer Reviewed:** 09/06/2022 - **Accepted for Publication:** 10/06/2022**ABSTRACT**

*Dhatu*s are the essential tissue elements responsible for the constitution of the human body. Among the seven basic tissue elements, *Meda Dhatu* (adipose tissue) is formed from the *Mamsa Dhatu* (muscles) with its own *Ushma* (heat) in addition to the *Snigdhatva* (unctuousness) and *Dravatva* (liquidity) *Guna* of *Apa Mahabhuta*. *Meda Dhatu* comprises two parts, one is the *Sthula Sthayi Meda* which remains in the pocket of fat in *Vapavaha* (abdominal fat) and the other part of *Meda* is *Drava Meda* which circulates through the body and different *Srotas* (channels) to provide nutrition to all the *Dhatu*s. *The Sthula Meda* may be co-related with adipose tissue and the *Drava Meda* may be compared with circulatory lipids. *Dhatudusti* can be explained in two forms - *Dhatukshaya* (diminution of tissue element) and *Dhatuvridhi* (increment in tissue element). Although in the majority of the diseases, *Dhatukshaya* is observed but in some diseases like *Sthaulya* (obesity), *Dhatudusti* in form of *Dhatuvridhi* (*Meda Dhatuvridhi*) is observed. *Sthaulya* (obesity) is such a condition where there is an abnormal increment in the amount of *Meda Dhatu* but the nutrition of all the other *Dhatu*s is compromised. Obesity has turned into a worldwide epidemic. A recent study in the year 2020 has shown that the prevalence of obesity in India is 40.3%. The typical dyslipidaemia of obesity consists of increased triglycerides (TG) and FFA, decreased HDL-C with HDL dysfunction, and normal or slightly increased LDL-C with increased small dense LDL. The principle of *Sat Karya Vada* has been mainly utilized in developing the basic fundamentals of *Ayurveda*. According to this doc-

trine, all the effects that come into manifestation after the fulfilment of the necessary conditions, have a previous existence in potential forms. The formation of *Meda Dhatu*, its role in the causation of *Sthaulya*, and its therapeutic management can be explained through this doctrine of *Sat Karya Vada*. **Aim:** The present study was carried out to evaluate the features of *Medadusti* in form of *Medavridhhi* in *Sthaulya* along with the efficacy of the stipulated *Medadusti Nashak* formulation - *Varunadi Kashayam* to combat *Sthaulya*. **Materials and Methods:** In selected 30 patients of *Sthaulya* having the *Medadusti Lakshan* based on inclusion and exclusion criteria, selected *Medadusti Nashak Chikitsa* (*Varunadi Kashayam*) was administered at a dose of 50 ml mixed with warm water before lunch and dinner for 60 consecutive days. **Result:** The subjective parameters for *Medadusti* are clinically present in a maximum number of *Sthaulya* (obesity) patients. The result also reveals the significant efficacy of *Varunadi Kashayam* on relevant subjective and objective parameters with a 'p-value <0.001 in the majority of subjective and objective parameters. **Conclusion:** The features of *Medadusti* in form of *Medavridhhi* can be clinically verified in patients of *Sthaulya*. Thus, it can be said that *Medadusti* in form of *Medavridhhi* has a definite role to play in the pathogenesis of *Sthaulya*. *Meda* should be regarded as the chief *Dushya* in *Sthaulya*. The patients suffering from *Sthaulya* can be treated with the therapeutic procedure responsible to combat *Medadusti*.

**Keywords:** *Meda*, *Medadusti*, *Medavridhhi*, *Sthaulya*, *Sat Karya Vada*, *obesity*.

## INTRODUCTION

The human body is composed of *Dosha*, *Dhatu*, and *Mala* <sup>(1)</sup>. *Dhatu*s are the essential tissue elements responsible for the constitution of the human body. Among the seven basic tissue elements, *Meda* (adipose tissue) has been considered one of them <sup>(2)</sup>. *Agni* is responsible for digestion (in form of *Jatharagni*), absorption (in form of *Bhutagni*), and metabolism (in the form *Dhatvagni*) <sup>(3)</sup>. The food provides nourishment to the tissue elements of the body, which are homologous and not contrary in nature <sup>(4)</sup>. The ingested food material at first goes through digestion followed by absorption and metabolism with the action of *Jatharagni*, *Bhutagni*, and *Dhatvagni* respectively. The pure and waste product of food after digestion and metabolism enters into circulation through the same channel. Each tissue element i.e., *Dhatu* has its own channel for circulation - known as *Srotas* <sup>(5)</sup>. By the virtue of the seven categories of *Dhatvagni*, the tissue elements get metabolised in the way of transformation of nourishing materials and transformation of waste products <sup>(6)</sup> where the *Kshira-Dadhi-Nyaya* (law of transformation), *Kedari-Kulya-Nyaya* (law of transmission) and *Khale-Kapota-Nyaya* (law of selectivity) are implied <sup>(7)</sup>. *Jatharagni* and *Bhutagni* acts at the level of the gastrointestinal tract, whereas *Dhatvagni* acts at the

cellular level. *Dhatu*s help in the nourishment of the body and provides nourishment to the subsequent *Dhatu* where *Upadhatu* only nourish the body <sup>(8)</sup>. *Meda* is produced from *Mamsa Dhatu* with the help of *Mamsagni* (specific *Dhatvagni* related to *Mamsa Dhatu*). The *Poshaka Bhaga* of *Mamsa Dhatu* converts into *Meda Dhatu* with the help of *Mamsagni* and subsequently, the *Poshaka Bhaga* of *Meda Dhatu* converts into *Asthi Dhatu* with the help of *Medagni* (specific *Dhatvagni* related to *Meda Dhatu*) as per *Kshira Dadhi Nyaya* theory of *Dhatu Paka* <sup>(9)</sup>. According to *Acharya Charaka*, *Meda* is formed from the *Mamsa* with its own *Ushma* (heat) in addition to the *Snigdhatva* (unctuousness) and *Dravatva* (liquidity) *Guna* of *Apa Mahabhuta* <sup>(10)</sup>. So, the nourishment of *Meda* is contributed by *Mamsa Dhatu*. According to *Acharya Sushruta*, *Meda* provides *Snehana* (lubrication), *Swedana* (sweating), *Drirhatva* (stability), and *Pustim Asthanam* (nourishment to bones) <sup>(11)</sup>. This can be explained in the way that, *Meda* provides *Snehana* to all other *Dhatu*s, *Ashayas*, *Srotas* and helps in expelling out *Kleda* through *Lomakopa* by *Swedan*, framing the structure of the body. *Snehana* towards *Dhatu* means *Meda* protects all *Dhatu*s from drying up. In absence of *Snehana*, *Dhatu*s dry up and the *Srotas* become *Rikta* (empty). In this condi-

tion possibility of *Vata*, *Prakopa* arises and susceptibility to disease also takes place<sup>(12)</sup>. The *Meda Dhatu* comprises two parts, one is the *Sthula Sthayi Dhatu* which remains in the pocket of fat in *Vapavaha* i.e abdominal fat<sup>(13)</sup>. The other part of *Meda* is *Drava Meda* which circulates through the body and different *Srotas* to provide nutrition to all the *Dhatu*s<sup>(14)</sup>. The *Sthula Meda* may be co-related with adipose tissue and the *Drava Meda* may be compared with circulatory lipids.

"*Vikara Dhatu Vaishamyam*" - the disease is caused by an imbalance between *Doshas*, *Dhatu*s, and *Malas*<sup>(15)</sup>. This imbalance can be explained in two forms - due to *Vridhhi* (vitiation/increase) and due to *Kshaya* (diminution)<sup>(16)</sup>. So by the term '*Dosha Dhatu Dusti*' both the state of *Vridhhi* and *Kshaya* should be understood in accordance with the pathology of a certain disease. The disease is primarily caused by vitiation of *Doshas*, not due to their diminution<sup>(17)</sup>. A diminutive *Dosha* can only manifest certain clinical features but cannot produce a disease<sup>(18)</sup>. But in the majority of the disease, *Dhatu Kshaya* (diminution of body tissues) occurs due to several factors<sup>(19)</sup>. In the pathogenesis of some selective diseases, *Dhatu Vridhhi* may be observed as an isolated phenomenon<sup>(20)</sup>. *Sthaulya* as mentioned by *Acharya Charaka* in *Charaka Samhita*, *Sutrasthan* under eight forbidden characters of human<sup>(21)</sup>, is such a condition where there is an abnormal increment in the amount of *Meda Dhatu* but the nutrition of all the other *Dhatu*s compromised<sup>(22)</sup>.

Due to intake of excessive food, intake of heavy-sweet-cold and oily food, avoidance of physical exercise, avoidance of sexual activity, the habit of the day sleeping, state of mental satisfaction, avoidance of mental anxiety and *Beeja Dosha* (chromosomal defect) leads to the formation of excessive *Meda* within the body<sup>(23)</sup>. This abnormally produced excessive *Meda* further obstructs the channels of the body leading to vitiation of *Vata Dosha*, which moving within the *Kostha* (abdominal cavity) causes stimulation of *Kosthagni* (digestive fire) leading to the rapid absorption of food thus enhancing the process of digestion. This complex phenomenon is responsible for exces-

sive hunger in the patient which forces the patient to intake more and more food, paving the pathway for the formation of more abnormal *Meda* within the body<sup>(24)</sup>. This vicious cycle has been depicted in diagram no. 1. So, we can come to a conclusion from the above discussion that, *Medadusti* in form of *Medavridhhi* is an essential phenomenon in *Sthaulya*. So, the clinical features of *Medavridhhi* as mentioned in our compendium like moisture of the skin, bulging of the abdomen with flanks, cough, respiratory difficulty, and foul odor of body<sup>(25)</sup> should be present in *Sthaulya* along with its clinical manifestation like - excessive increment of *Meda* & *Mamsa* in body, pendulous movement of the abdomen - buttock - breasts, impairment of physical enthusiasm, etc.<sup>(26)</sup>. This concept of *Medadusti* in form of *Medavridhhi* in the state of *Sthaulya* can be verified through modern studies also. Obesity is a state of excess adipose tissue mass<sup>(27)</sup>, thus can be correlated with the state of *Sthaulya*. Obesity has turned into a worldwide epidemic. In the last decades, the number of obese patients has increased considerably<sup>(28)</sup>. A recent study in the year 2020 has shown that the prevalence of obesity in India is 40.3%. Zonal variations were seen as follows: south highest at 46.51% and east lowest at 32.96%. Obesity was higher among women than men (41.88% vs. 38.67%), urban than rural (44.17% vs. 36.08%), and over 40 than under 40 (45.81% vs. 34.58%)<sup>(29)</sup>. Visceral obesity leads to insulin resistance in part mediated by adipokines and free fatty acids (FFA)<sup>(30)</sup>. Adipokines such as resistin and retinol-binding protein 4 decrease insulin sensitivity, whereas leptin and adiponectin have the opposite effect<sup>(31)</sup>. In addition, cytokines like TNF- $\alpha$  and IL-6, which originate from macrophages in adipose tissue, are involved<sup>(32)</sup>. Obesity, especially central obesity, is probably the main cause of the metabolic syndrome (MetS), which includes insulin resistance, type 2 diabetes mellitus, hypertension, the obstructive sleep apnoea syndrome, non-alcoholic fatty liver disease (NAFLD), and dyslipidaemia, all risk factors for cardiovascular disease<sup>(33)</sup>. The typical dyslipidaemia of obesity consists of increased triglycerides (TG) and FFA, decreased HDL-C with HDL dysfunction, and

normal or slightly increased LDL-C with increased small dense LDL<sup>(34)</sup>. The concentrations of plasma apo lipoprotein (apo) B are also often increased, partly due to the hepatic overproduction of apo B containing lipoproteins<sup>(35)</sup>. Lipid metabolism is highly dynamic and depends on numerous factors including the postprandial state, TG-rich lipoprotein concentrations, HDL levels and function, energy expenditure, insulin levels, sensitivity, and adipose tissue function<sup>(36)</sup>. The hallmark of dyslipidaemia in obesity is elevated fasting and postprandial TG in combination with the preponderance of small dense LDL and low HDL-C<sup>(37)</sup>. Hypertriglyceridemia may be the major cause of the other lipid abnormalities since it will lead to delayed clearance of the TG-rich lipoproteins and the formation of small dense LDL<sup>(38)</sup>. HDL metabolism is also strongly affected by obesity because of the increased number of remnants of chylomicrons and VLDL together with impaired lipolysis. The increased number of TG-rich lipoproteins results in increased CETP activity, which exchanges cholesterol esters from HDL for TG from VLDL and LDL<sup>(39)</sup>. Moreover, lipolysis of these TG-rich HDL occurs by hepatic lipase resulting in small HDL with a reduced affinity for apo A-I, which leads to dissociation of apo A-I from HDL. This will ultimately lead to lower levels of HDL-C and a reduction in circulating HDL particles with impairment of reversed cholesterol transport<sup>(40)</sup>. Although not a direct measure of adiposity, the most widely clinically used method to gauge obesity is the body mass index (BMI), which is equal to weight/height<sup>2</sup> (in kg/m<sup>2</sup>)<sup>(41)</sup>. Other approaches to quantifying obesity include anthropometry (skinfold thickness), densitometry (underwater weighing), CT or MRI, and electrical impedance<sup>(42)</sup>. BMI for the midpoint of all heights and frames among both men and women ranges from 19-26kg/m<sup>2</sup><sup>(43)</sup>. Based on data on substantial morbidity, a BMI of 30 is most commonly used as a threshold for obesity in both men and women. A BMI between 25 and 30 should be viewed as medically significant and worthy of therapeutic intervention<sup>(44)</sup>. The distribution of adipose tissue in different anatomic depots also has substantial implications for morbidity. This

distinction is most easily made clinically by determining the waist to hip ratio, with a ratio of >0.9 in women and >1.0 in men being abnormal<sup>(45)</sup>.

Concerning the evolution of the universe, many theories were established, from ancient times to modern times. One of them is the "cause and effect" theory which is called *Karya Karana Vada* in terms of *Darshana*<sup>(46)</sup>. Every *Karya* has a *Karana* and whatsoever the *Karya* may be a *Karana* for a future *Karya*. This principle of relation between *Karya* and *Karana* is called *Karya Karana Vada*. *Karya* is *Vyaktavastha* (manifested stage) and *Karana* is *Avyaktavastha* (not manifested stage)<sup>(47)</sup>. So there is only change in the stages. As per this theory, in creation *Karya* cannot be produced without *Karana*. *Karya* resides in *Karana* in subtle form hence it is capable to produce relevant *Karya*. There is *Karanatva* in *Karya* and *Karyatva* in *Karana*. All factors that existed before *Karya* cannot be considered as *Karana*. It should possess the following 3 characteristics to be called *Karana*<sup>(48)</sup>: 1. *Ananyathasiddh* (*Karya* cannot take place without *Karana*) 2. *Niyata* (Whenever *Karya* exists the *Karana* should exist invariably) 3. *Purva Vritti* (Cause should exist prior to effect). According to various philosophical schools, *Karana* is of three kinds namely *Samavayi* (Inherent), *Asamavayi* (non-inherent), *Nimitta Karana*. *Samavayi* is that in which the effect produced inheres, that is intimately connected or identical with it, that it cannot be separated from the cause without losing its own existence. The *Asamavayi Karana* is described in *Tarka Sangraha* as that which contributes to the production of the effect while co-inhering the effect in its material cause. It is inseparably united in the same object with the effect. This *Asamavayi Karana* exists in the same object along with the *Samavayi Karana* of its own effect<sup>(49)</sup>. The *Nimitta Karana* is a cause that is other than both *Samavayi* and *Asamavayi* causes. *Nimitta Karana* is different from *Samavayi* and *Asamavayi Karanas* and is the instrumental cause only. It helps the *Samavayi* and *Asamavayi Karana* in the production (creation of *Karya*). After the production of *Karya*, this *Karana* detach from *Karya*<sup>(50)</sup>. In accordance with the genesis of disease all the causative factors or Hetu should

be regarded as Nimitta Karana, Dosha should be regarded as Samavayi Karana, and Dushya should be regarded as Asamavayi Karana <sup>(51)</sup>. According to Samkhya philosophers, all the effects that come into manifestation after the fulfilment of the necessary conditions, have a previous existence in potential forms. This doctrine is called the doctrine of the precocious existence of the effect, namely *Sat Karya Vada* <sup>(52)</sup>. This Samkhya doctrine of *Sat Karya Vada* is accepted by the Vedanthists also. The principle of *Sat Karya Vada* has been mainly utilized in developing the basic fundamentals of *Ayurveda*. *Ayurveda* too accepts that without the cause, there is no action. While describing the *Dravyotpatti*, *Karya Karana Bhavas* has been dealt with. Similarly, it is considered that all the *Vyakta Bhavas* are having some cause for their production <sup>(53)</sup>. According to *Acharya Charaka*, *Samanya*, *Visheṣa*, *Guṇa*, *Dravya*, *Karma*, and *Samavaya* are the causative factors for the whole universe, or these are six such factors which are responsible for everything in this universe and hence known as *Shat Karanas* <sup>(54)</sup>. Healthy status is maintained when *Dosha*, *Dhatu*, and *Mala* are in homeostasis, and when this homeostasis is disturbed, it leads to *Vyadhi* <sup>(55)</sup>. To create this *Dosha Vaishamya* or

*Vyadhi*, certain causes are required, and these are the *Nidana* called *Karana* in *Ayurveda* <sup>(56)</sup>. Consumption of *Vishama Hetu* causes *Vaishamyata* of *Shareera Dhatu* and so as vice versa. This imbalance between *Dhatus* leads to the manifestation of several diseases. Again, by application of *Aoushadha*, one can correct this imbalance of *Dhatus*, thus *Aoushadha* acts as *Karana* for the *Karya* i.e., effect - *Dhatu Samya* <sup>(57)</sup>. In the present context, the formation of *Meda Dhatu* from *Mamsa Dhatu*, its abnormal increment due to various *Nidan Sevan*, the role of *Medadusti* in the causation of *Sthaulya* and its management with *Medadusti Nashak Chikitsa* - all these can be explained by the theory of *Sat Karya Vada*. So, the present study has been carried out to evaluate the following aims & objectives:

1. Concept of *Meda* and its role in the causation of *Sthaulya* in accordance with the theory of *Sat Karya Vada*.
2. Evaluation of *Medadusti* in form of *Medavridhhi* in *Sthaulya*.
3. Evaluation of efficacy of the selected *Ayurvedic* preparation - *Varunadi Kashayam* on *Medadusti* and subsequently its role to combat *Sthaulya*.

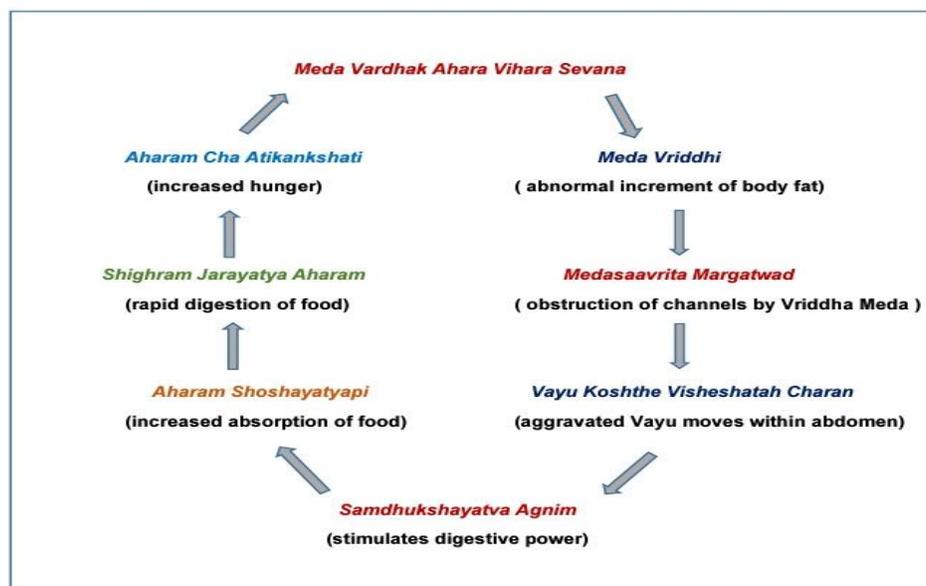


Diagram 1: Vicious cycle of *Sthaulya* in accordance with *Sat Karya Vada*

## Materials And Methods:

*Medadusti* in from of *Medavridhhi* is the main pathological cause in *Sthaulya*. The literary information regarding *Medadusti* in *Sthaulya* was verified through a clinical study. Assessment of *Medadusti* in *Sthaulya* was done on the basis of some subjective criteria and objective criteria. The study has been also carried out to evaluate the clinical efficacy of the stipulated preparation of *Varunadi Kashayam* to combat *Medadusti* as occurs in *Sthaulya*. *Varunadi Kashayam* is a well-known drug that is effective in *Medadusti* <sup>(58)</sup>. This drug was administered to the patients included in the study to observe the improvement of subjective and objective criteria. The subjective and objective criteria were evaluated before and after treatment.

## Selection of the Patients:

30 patients were selected from OPD of the Institute of Post Graduate Ayurvedic Education & Research at SVSP hospital, Kolkata irrespective of their sex, occupation, and religion. The patients having the features of *Sthaulya* were selected for the study and subsequently, the features of *Medadusti* were evaluated on the basis of subjective and objective parameters. Prior to carry out the study, the informed patient consent form was duly signed by the patients.

## Inclusion Criteria:

1. Patients above 20 years of age and below 60 years of age, irrespective of their occupation, sex, and religion.
2. Patients who are willing to include themselves in the study.
3. Patient having BMI >25 kg/m<sup>2</sup>.
4. Patients with increased abdominal circumference (>90cm in Male and >80 cm in Female).
5. Patents with increased High Waist: Hip ratio (> 1.0 in male and > 0.9 in women).
6. Patients satisfying the maximum subjective criteria of *Sthaulya*.

## Exclusion Criteria:

1. Patients below 20 years and above 70 years of age.
2. Patients those who are not willing to include themselves in the study.

3. Patients having BMI < 25.
4. Patients suffering from complications of *Sthaulya*.
5. Patients suffering from any type of cardiovascular diseases, hypertension, gall bladder diseases, hypothyroidism, malignancy, or any other endocrinal disorder.

## Subjective Parameters: <sup>(59)</sup>

1. *Snigdha Angataa* (visible glaze of body)
2. *Swasa* (difficulty in respiration)
3. *Sharira Durgandhata* (bad odour of body)
4. *Udara Parshva Vriddhi* (waist circumference greater than 80 cm in female and 90 cm in the male)
5. *Meda Ati Vriddhi* (BMI greater than 25 kg/m<sup>2</sup>)

## Objective Parameters:

1. Estimation of total Cholesterol, HDL, LDL & Triglyceride

## Adoption of Drug:

*Varunadi Kashayam* is a well-known classical Ayurvedic formulation mentioned in *Sharangadhar Samhita* under *Kwath Kalpana*. This formulation is consisting of several drugs like *Varuna*, *Bakapushpa*, *Bilva*, *Apamarga*, *Chitrak*, *Agnimantha*, *Prishniparni*, *Shigru*, *Brihati*, *Kantikari*, *Saireyak*, *Murva*, *Meshashringi*, *Ajashringi*, *Bimbi*, *Karanja* and *Shatavari* <sup>(60)</sup>. This formulation has been considered as - *Kapha Meda Nashak* and indicated in several ailments like *Gulma*, *Shirashula*, and *Abhyantar Vidradhi* <sup>(61)</sup>. Considering *Meda* as chief *Dushya* in *Ati Sthaulya* and *Medavridhhi* as the *Mukhya Vikriti* in *Sthaulya*, this formulation has been adopted for the study. The raw ingredients of this stipulated formulation have been procured from the local market and the formulation was prepared in the apothecary department of the study conducting institution following the standard procedure of making *Kwath Kalpana* <sup>(62)</sup>. The formulation has been administered in a dose of 50 ml mixed with warm water before lunch and dinner (twice daily) for 90 consecutive days. After 90 days the effect of the stipulated drug has been evaluated.

**Pathyapathya (diet restrictions):**

Patients were advised the following restricted diet throughout the treatment period of 90 days:

**Table 01**

Sl. No.	Name of Diet	Daily Amount	Energy Value
01.	Rice / Wheat	50 gm	175 Kcal
02.	Pulse	50 gm	170 Kcal
03.	Vegetables		
	(i) Cabbage	100 gm	29 Kcal
	(ii) Carrot	100 gm	45 Kcal
	(iii) Spinach	100 gm	25 Kcal
04.	Fruits	100 gm	40 Kcal
05.	Fat	25 gm	225 Kcal
06.	Egg	1 such	80 Kcal
07.	Shellfish	100 gm	50 Kcal
08.	Milk	100 ml	70 Kcal

Vyayama or physical exercise was advised according to individual capacity along with the restricted diet. In the present study, all the patients of each group were advised for brisk walking for one hour daily (brisk walking utilizes 7-20 Kcal/minute).

**Study Protocol:**

**Duration of Study:** The duration of the study was 90 days.

1. *Snigdha Angataa* :

Characteristics	Score
No feasible visible glaze	0
Feasible visible glaze in some part of the body	1
Feasible visible glaze in buttock, abdomen, thigh & neck	2
Feasible visible glaze all over the body	3

2. *Swas*:

Characteristics	Score
No difficulty in respiration after exertion	0
Mild difficulty in respiration after exertion	1
Moderate difficulty in respiration after exertion	2
Severe difficulty in respiration after exertion	3

3. *Sharira Durgandhata*:

Body Odor	Score
No Body odor	0
Body odor after 12 hours of bath	1
Body odor after 6 hours of bath	2

**Assessment Criteria:** Assessment has been done on the basis of subjective and objective parameters before and after treatment. For the statistical evaluation all the subjective parameters have been arranged as per gradation as follows (except *Udara Parshva Vriddhi* and *Meda Ati Vriddhi* as these are measured by modern parameters):

Body odor after 3 hours of bath	3
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**Follow-up of Patients:** All the patients were reviewed after 90 days from the date of administration of the first dose. Any special information regarding the general health of the patient was recorded accordingly.

**Study Sample:** A total of 30 patients of *Sthaulya* with features of *Medadusti* were included in the study.

**Statistical Analysis:** The information gathered on the basis of observation made about various parameters has been subjected to statistical analysis in terms of Mean, Standard Deviation (SD), and Standard Error (SE). Paired 't'-test was carried out at  $P < 0.05$  and  $P < 0.001$ . The obtained results were interpreted as  $-P < 0.05$  is significant &  $P < 0.001$  is highly significant.

**Observations And Results:**

Distribution of subjective parameters among 30 patients of *Sthaulya* shows that *Snigdha Angataa* present in 28 number of patients, *Swas* present in 26 number of patients, and *Sharira Durgandhata* is present in 29 patients, *Udara Parshva Vriddhi* & *Meda Ati Vriddhi* present in all among the patents (Table no. 1). Statistical analysis of subjective and objective parameters in 30 patients of *Sthaulya* before and after 90 days of treatment shows that the stipulated formulation i.e., *Varunadi Kashayam* has significant efficacy on both the subjective and objective parameters with 'a p-value  $< 0.001$  in most of the parameters after 90 days. (Table no. 2).

**Table 1:** Distribution of subjective parameters among 30 patients of *Sthaulya*

No.	Subjective Parameters	No. of patients	Percentage
01.	<i>Snigdha Angataa</i> (visible glaze of body)	28	93.33%
02.	<i>Swas</i> (difficulty in respiration)	26	86.66%
03.	<i>Sharira Durgandhata</i> (bad odor of body)	29	96.66%
04.	<i>Udara Parshva Vriddhi</i> (waist circumference greater than 80 cm in female and 90 cm in the male)	30	100%
05.	<i>Meda Ati Vriddhi</i> (BMI greater than 25 kg/m <sup>2</sup> )	30	100%

**Table 2:** Statistical analysis of subjective and objective parameters in 30 patients of *Sthaulya* before and after 90 days of treatment

Parameters	Mean BT	Mean AT	SD+/-	SE+/-	't' value	'p-value
<i>Snigdha Angataa</i>	1.96	0.78	0.547	0.103	11.39	$< 0.001$
<i>Swas</i>	1.78	0.64	0.448	0.084	13.56	$< 0.001$
<i>Sharira Durgandhata</i>	1.34	0.37	0.594	0.105	9.21	$< 0.001$
<i>Udara Parshva Vriddhi</i>	95.71	90.7	5.133	0.94	4.75	$< 0.001$
<i>Meda Ati Vriddhi</i>	27.34	25.21	0.553	0.099	13.83	$< 0.001$
Serum Total Cholesterol	211.25	209.96	0.456	0.082	15.6	$< 0.001$
Serum HDL Cholesterol	62.25	63.93	1.15	0.217	7.73	$< 0.001$
Serum Triglyceride	168.87	166.81	1.91	0.343	6.00	$< 0.001$

**DISCUSSION**

According to the theory of *Sat Karya Vada*, every phenomenon (*Karya*) can be explained through its own causative factors (*Karana*) and all the effects that come into manifestation after the fulfilment of the necessary conditions, have a previous existence in

potential forms <sup>(63)</sup>. *Sthaulya* is a condition where due to intake of several causative factors (*Karana*) there is vitiation of *Kapha Dhatu* and affliction of *Meda Dhatu* which gives rise to an abnormal increment of *Meda Dhatu* in the body - the condition known as -

Sthaulya. So, for Sthaulya as Karya (effect) need three types of Karana (cause) - Hetu as Nimitta Karana, Kapha Dosha as Samavayi Karana, and Meda Dhatu as Asamavayi Karana. Comparison between the causative factors of Medavaha Srotadusti (identical to Medadusti) and Sthaulya are given in Table 3.

**Table 3:** Comparison between the causative factors of Medavaha Srotadusti (identical to Medadusti) and Sthaulya: <sup>(64)</sup>

Causative Factors	Medavaha Srotadusti	Sthaulya
Avyayam (absence of physical exercise)	++	++
Divaswapna (habit of the day sleeping)	++	++
Medyanam Atibhakshanam (excessive intake of fatty substance)	++	-
Varuni Madya Atisevanam (excessive intake of alcoholic substance)	++	-
Atisampuran (intake of excessive food)	-	++
Guru-Madhura-Shita-Snigdha Upayoga (intake of heavy-sweet-cold and oily food)	-	++
Avyavaya (avoidance of sexual activity)	-	++
Harsha Nityatwad (state of mental happiness)	-	++
Achintanad (avoidance of mental anxiety)	-	++
Beeja Dosha (chromosomal defect)	-	++

Avyayam and Divaswapna are considered causative factors for both Medadusti and Sthaulya directly. Whereas Medyanam Atibhakshanam may be compared with Guru-Madhura-Shita-Snigdha Upayoga as properties of Meda are similar to that. Both types of foods are Apa and Prithivi Mahabhuta dominant and cause obstructions of channels. Again, Medyanam Atibhakshanam can be compared with Atisampuran also as both the factors refer to excessive intake of food in general or specifically. Vyavaya (sexual activity) can be considered a type of Vyayama. So, Avyavaya can be compared with Avyayama. So, from the above discussions, it is clear that the majority of the factors that are responsible for Medadusti are also identical in the case of Sthaulya. So, it should be un-

derstood that Medadusti (Karya) is an essential phenomenon in the case of Sthaulya (Karya) as the causative factors (Karana) for both are identical. Table 1 shows that most of the patients of Sthaulya were satisfying the subjective criteria for Medadusti (in terms of Medavridhi). It signifies that Medadusti is an essential phenomenon in the case of Sthaulya. From the pathogenesis of Sthaulya as discussed earlier it is evident that Medadusti in form of Medavridhi leads to the deposition of more and more abnormal Meda in the body resulting in Sthaulya. According to the theo-

ry of Sat Karya Vada, this Medadusti can be considered as Karana and its effect i.e., Sthaulya can be considered as Karya. The pathophysiology of the typical dyslipidaemia observed in obesity is multifactorial and includes hepatic overproduction of VLDL, decreased circulating TG lipolysis and impaired peripheral FFA trapping, increased FFA fluxes from adipocytes to the liver and other tissues, and the formation of small dense LDL. Impairment of the ASP/C3adesArg pathway probably contributes to the typical dyslipidaemia as well <sup>(65)</sup>.

Statistical analysis of various subjective and objective parameters of 30 patients, before and after 90 days of treatment in Table 2 shows the p-value <0.001 in most of the parameters, which indicates that the stipulated Ayurvedic formulation Varunadi Kashayam is significantly efficacious in the management of Sthaulya after 90 days. Varunadi Kashayam is said to be efficacious in Medadusti as mentioned by our classical texts and this information is verified by this statistical analysis. Moreover, the detailed analysis of individual properties (Rasa, Guna, Virya, and Vipaka) of the ingredients of this formulation has shown that most of the ingredient contains Tikta, Katu, and Kashaya Rasa, Laghu - Ruksha Guna, Ushna Virya and Katu Vipak - thus

very much effective to reduce *Medadusti* and subsequently to reduce *Sthaulya* (Table 4).

**Table 4:** Individual properties of the ingredients of *Varunadi Kashayam*:

Ingredients	Rasa	Guna	Virya	Vipaka
Varuna <sup>(66)</sup>	Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu
Bakapushpa <sup>(67)</sup>	Tikta	Laghu, Ruksha	Shita	Katu
Bilva <sup>(68)</sup>	Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu
Apamarga <sup>(69)</sup>	Katu, Tikta	Laghu, Ruksha, Tikshna	Ushna	Katu
Chitrak <sup>(70)</sup>	Katu	Laghu, Ruksha, Tikshna	Ushna	Katu
Agnimantha <sup>(71)</sup>	Katu, Tikta, Kashaya	Ruksha, Laghu	Ushna	Katu
Gambhari <sup>(72)</sup>	Tikta, Kashaya, Madhur	Guru	Ushna	Katu
Shigru <sup>(73)</sup>	Katu, Tikta	Laghu, Ruksha, Tikshna	Ushna	Katu
Brihati <sup>(74)</sup>	Katu, Tikta	Laghu, Ruksha	Ushna	Katu
Kantikari <sup>(75)</sup>	Katu, Tikta	Laghu, Ruksha, Tikshna	Ushna	Katu
Murva <sup>(76)</sup>	Tikta, Kashaya	Guru, Ruksha	Ushna	Katu
Meshashringi <sup>(77)</sup>	Kashaya, Tikta	Laghu, Ruksha	Ushna	Katu
Bimbi <sup>(78)</sup>	Tikta	Laghu, Ruksha, Tikshna	Ushna	Katu
Karanja <sup>(79)</sup>	Katu, Tikta, Kashaya	Laghu, Tikshna	Ushna	Katu
Shatavari <sup>(80)</sup>	Madhura, Tikta	Guru, Snigdha	Shita	Madhura

## CONCLUSION

*Meda* is one of the most important *Dhatu* among the seven *Dhatus*. The *Meda Dhatu* comprises two parts, one is the *Sthula Sthayi Dhatu* which remains in the pocket of fat in various places of the body and the other part of *Meda* is *Drava Meda* which circulates through the body and different *Srotas* to provide nutrition to all the *Dhatus* (138). The *Sthula Meda* may be co-related with adipose tissue and the *Drava Meda* may be compared with circulatory lipids. Due to various *Nidan Sevan*, *Medadusti* occurs. This *Medadusti* can be viewed as either *Medakshaya* (seen in the majority of the diseases) or *Medavridhi* (seen in some selected diseases like *Sthaulya*). *Medadusti* in terms of *Medavridhi* is an essential phenomenon in *Sthaulya*. *Sthaulya* is a state of excess *Meda* within the body, a condition similar to obesity. The typical dyslipidaemia of obesity consists of increased triglycerides (TG) and FFA, decreased HDL-C with HDL dysfunction, and normal or slightly increased LDL-C with increased small dense LDL. As per the doctrine of *Sat Karya Vada*, this *Medavridhi* acts as *Karan* in the pathogenesis of *Sthaulya* which can be considered as *Karya*. Features of *Medadusti* can be

clinically verified in the patients of *Sthaulya*. *Varunadi Kashayam* is a well-known classical *Ayurvedic* formulation used to combat *Medadusti*. This study reveals that this *Ayurvedic* formulation is very effective in the case of *Medadusti* and further helps us to reduce *Sthaulya*. Thus, the patients suffering from *Sthaulya* can be treated with therapeutic medicines like *Varunadi Kashayam* which are responsible for combating *Medadusti*.

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