

Comparative Evaluation of Efficacy of *Gomaya Mashi Udvartana* with *Petiswedana* And *Rodhradi Gana Udvartana* with *Petiswedana* In The Management of *Sthoulya* (Obesity)

Introduction

The World health organisation has defined Obesity as a condition with excessive fat accumulation in the body to the extent that health is adversely affected[1]. Obesity results from positive energy imbalance expressed by body mass index (BMI) of 25–29.9 and ≥ 30 kg/m², respectively[2,3]. In 2000,WHO labelled Obesity as most blatantly visible, but most neglected, public health problem worldwide[4].Obesity has become a major public health problem in both developed and developing countries as they causally related to wide spectrum of chronic noncommunicable diseases including Type 2 Diabetes, Cardiovascular diseases and Cancer[5]. Both generalized Obesity and Abdominal Obesity are associated with an increased risk of morbidity and mortality[6]. Moreover, several studies reported obesity as the well-documented major risk factor for many noncommunicable diseases and health conditions including Hypertension, High Lipid Concentrations, Type-2 Diabetes, Coronary Heart Disease, Stroke, and certain Cancers.[7-11] According to WHO in 2016, more than 1.9 billion adults aged 18 years and older were Overweight or Obese[12]. The global burden of Obesity is recorded to be 4 million deaths and 40 million disability-adjusted life years among adults globally in 2015[13].The prevalence of Obesity in urban area of Maharashtra is 6.6% and 2.2%. Prevalence of Obesity in rural area is 3.4% and 0.6%. The prevalence of Obesity is higher in urban area as compared to rural area. Lack of physical activities, family factors, frequently and overeating habits are important risk factors.[14]

The prevalence of Obesity in India varies due to age, sex, geographical environment, socio-economic status etc. According to ICMR-INDIAB study 2015, prevalence rate of Obesity and central Obesity are varies from 11.8% to 31.3% and 16.9%-36.3% respectively. In India, Abdominal Obesity is one of the major risk factors for cardiovascular disease (CVDs). This problem of Obesity can be preventable by spreading awareness among people about Obesity and its health consequences. Governmental agencies should promote benefits of healthy life style, food habits and physical activity.[15]. Obesity is most prevalent in middle-age, but can

occur at any stage of life. Normally the women are more prone than men[16]. Many low- and middle-income countries are now facing a “double burden” of disease. While these countries continue to deal problems of infectious diseases and undernutrition, they are also experiencing a rapid increase in noncommunicable disease risk factors such as Obesity and Overweight, particularly in urban settings[17].

Although many studies reporting the prevalence and determinants of Obesity, there are limited studies on this aspect that reported determinants of Obesity among men aged 20–59 years at the national level. Therefore, identifying determinants will have paramount importance in the prevention and control of these emerging public challenges in Ethiopia. The information can be used as baseline evidence for program planners, policymakers, and researchers working on the prevention of chronic noncommunicable diseases. It will also help community members by providing information on risk factors of Obesity.

There are different treatment modalities are described by modern science for the management of Obesity like Diet, Exercise, Drug therapy and Surgery. But, due to their certain limitations i.e. neurological and psychiatric side effects. They cause fatty/ oily stool, faecal urgency and deficiency of fat soluble vitamins[18]. So, it is our need to search simple but effective treatment modality in alternative science i.e. *Ayurveda*.

According to *Ayurveda*, Obesity can be correlated with *Sthoulya* that is to say predominance of *Kapha* and *Meda dushti*. *Sthoulya* is one among the major diseases that comes under the category of *Santarpanotha Vyadhi* (Nutritional Disorders) caused due to *Dushti of Medovaha Srotasa*. It is an abnormal and excessive accumulation of *Meda Dhatu* in the body.[19] *Acharya Charak* considered *Atisthula* as one among *Astonindita Purusha*,[20] *Meda* is increased in the body due to lack of physical exercises, sleeping during day time, consuming food which increases *Kapha Dosh*, ingestion of excess fats/oils and substances that are predominantly sweet in taste. All the channels that continuously supply nutrients to other tissues are blocked by *Medas* (Fats), so further tissues are not properly formed and only *Medas* get accumulated. Because of this unequal distribution of fats in the body, the person is called *Sthula*. In *Sthoulya* the person suffers from mild dyspnea, thirst, drowsiness, excess sleep & appetite, offensive smell from the body, incapability to work and incapability to participate in sexual intercourse.

Ayurvedic line of treatment is vividly elaborated by *Ayurveda* through various *Shaman* and *Shodhan* procedures. Among *Shodhana*, it can be classified based on route of administration by external and internal ways. Among them, *Udvaartana* and *Peti swedana*, these are *Bahya*

Shodhana procedures which eliminates Vitiated dosha through skin and helps in melting fat. *Udvartana* has *kaphhar* and *Medohar* properties. According to *Acharya Charaka*, *Udvartana* is of 2 types, *Snigdha Udvartana* and *Ruksha Udvartana*. In which *Ruksha Udvartana* is used in the context of treatment of *Sthula* (obese patients), in which dry powder of herbs without oil, used during the procedure.

The previous clinical evidences shows that many herbal drugs can be used for *Udvartana* but through this study novel efforts are done to study the comparative efficacy of *Udvartana* with *Gomaya Mashi* i.e. cow dung ash powder (Animal product) and herbal powder in management of Obesity.

1.1] Need of Study –

World Health Organization has identified Obesity as a global epidemic. Use of latest technologies by human has brought drastic changes in dietary habits, modes of lifestyles and various regimens of life. Most of people are habituated to comfortable lifestyle which lead to Obesity, which is associated with increase in risk of Hypertension, Type 2 Diabetes mellitus, Coronary Heart Disease and Hyperlipidaemia like metabolic disease, Arthritis and certain Cancers (Colorectal Cancer in males and Cancer of Gall bladder, Biliary Tract, Breast, Endometrium and Cervix in female) and it significantly increases the risk of mortality at any age. Obesity may have profound psychological consequences, compounded by stigmatization of the Obesity in many societies.[21]

As Obesity is spreading widely and considering the above limitations of conventional measures. So, there is need to study some natural but effective and safe animal product and herbal formulation in *Ayurveda* through which weight of patients can be maintained and the associated symptoms could be managed without causing any undue effects.

There are many *Shodhan* procedure in *Ayurveda* described for *Sthoulya* (Obesity) such as *Vaman*, *Virechan*, *Lekhan basti* and *Udvartana*. Among them, *Vaman*, *Virechan* and *Lekhan basti* has their own limitations like pre and post therapeutic procedures, which are time consuming for the patient and some patients hesitate to undergo *Lekhan basti*. That's why, the standard treatment modality used in the management of *Sthoulya* (Obesity) is *Udvartana*. *Udvartana* has *Kapha-Meda vilayana* property. To enhance the *Medovilayana* property, *Katu-Tikta rasa* (pungent-bitter); *Ushnavirya*; *LaghuRuksha-Tikshna guna dravyas* are present. *Twakastha agni* gets stimulated, this leads to absorption and digestion of the drug and further does *Pravilayana* of *Medha Dhatu* (liquefaction of subcutaneous fat) below skin may occur.

In *Sthoulya* (Obesity) there is increase in *vikruta Meda Dhatu* which increases *Kleda*. Due to *kleda*, *srotas* (channels) get obstructed and *abaddha Meda Dhatu* (loose fat) is formed. This may lead to *Dhatu agni mandya* (decreased molecular level fire of MedaDhatu). Due to *Ushna*, *Tikshna*, *Laghu* property of the Dravya and procedure, it acts as *Medahara*. Due to *Ruksha guna* of Dravya and *Ruksha Udvartana*, *kleda* gets absorbed (*Shoshane Ruksha|| Hemadri*) Thus *Abaddhatva* of *Meda* and *Kapha* might have reduced.

1.2] Research Question:

Whether *Gomaya Mashi Udvartana with Petiswedana* is more efficacious than the *Rodhradi Gana Udvartana with Petiswedana* in the management of *Sthoulya* (Obesity)?

1.3] Hypothesis:

NULL HYPOTHESIS:

Gomaya Mashi Udvartana with Petiswedana is not more efficacious than *Rodhradi Gana Udvartana with Petiswedana* in management of *Sthoulya* (Obesity).

ALTERNATE HYPOTHESIS:

Gomaya Mashi Udvartana with Petiswedana is more efficacious than *Rodhradi Gana Udvartana with Petiswedana* in management of *Sthoulya* (Obesity).

2.Review of Literature –

A. Disease Review:

❖ Review of Obesity as per *Ayurveda*'s perspective:

Table No.1: Textual references of *Sthoulya* from *Ayurvedic* sculptures and modern books:

S. N.	Text	Sthan	Adhyaya	Topic	Shaloka no.
1	Charak Samhita	<i>Sutrasthana</i>	14, <i>Swedadhyaya</i> , 21, <i>Ashtonindita</i> <i>Adhyaya</i>	<i>Pinda sweda hetu dravya</i> , <i>Atisthula Purush</i> <i>Dosha,Hetu, Lakshan</i> , <i>Pathyapathya, Chikitsa</i>	14/26 21/4- 9 21/21 -28
2	<i>Sushruta Samhita</i>	<i>Sutrasthana</i>	15, <i>Doshadhatu mala</i> <i>Vidnyan Adhyaya</i>	<i>Nidan,Samprapti, Chikitsa</i>	15/37 -38
3	<i>Sushruta Samhita</i>	<i>Chikitsa</i> <i>Sthan</i>	24, <i>Anaagatbadha</i> <i>Pratished</i>	<i>Udvartan Varnan</i>	24/51
4	<i>Ashtanga</i> <i>Sangraha</i>	<i>Sutrasthana</i>	14, <i>Dvividhopkrama</i> <i>niya Adhyaya</i>	<i>Nidan,Samprapti, Chikitsa</i> <i>Upkrama of Sthoulya</i>	24/18 -40
5	<i>Ashtanga Hridya</i>	<i>Sutrasthana</i>	14, <i>Dvividhopkrama</i> <i>niya Adhyaya</i>	<i>Sthoulya Chikitsasutra</i> , <i>Vishesh Chikitsa</i>	14/20 -28
6	<i>Madhavnidan</i>	<i>Sutrasthana</i>	34, <i>Medoroga</i> <i>Nidanam</i>	<i>Lakshana and Samprapti of</i> <i>Medoroga</i>	34/1- 9
7	<i>Chakradatt</i>		36, <i>Sthoulya Chikitsa</i>	<i>Pathya and Chikitsa of</i> <i>Sthoulya</i>	36/1- 39
8	<i>Sharangdhar</i> <i>Samhita</i>	<i>Pratham</i> <i>Khanda</i>	7. <i>Rogganana</i> <i>Adhyaya</i>	<i>Medodosh Lakshana</i> , <i>Samprapti</i>	7/62

9	<i>Bhavprakash Samhita</i>	<i>Madhyam Khanda</i>	<i>39, Sthoulyadhikar Chikitsa</i>	<i>Sthoulya Nidan, Samprapti, Lakshana, Chikitsa</i>	39/1-29
10	<i>Yogratnakar</i>	-	<i>4, Medorogadhikar</i>	<i>Sthoulya Chikitsa</i>	4/36
11	<i>Vangsen Samhita</i>	-	<i>42, Medorogadhikar</i>	<i>Nidan, Samprapti, Chikitsa</i>	42/1-28
12	<i>Bhaishajya rtnavali</i>	-	<i>39, Medoroga Chikitsa</i>	<i>Sthoulyanashaka Chikitsa</i>	39/1-44
13	<i>Gadnigraha</i>	-	<i>31, Medorogadhikar</i>	<i>Nidan, Lakshana and Samanya Chikitsa</i>	31/1-25
14	<i>Rasaratnasamucc haya</i>	-	<i>18, Sthoulya Nidan Chikitsa Prakaran</i>	<i>Rasa preparation for Sthoulya</i>	18/179-201
15	Davidson's Principles & Practice of Medicine	-	Chapter 5 Environmental & nutritional factors in disease	Complications, Aetiology, Clinical assessment and Investigations, Management	
16	Textbook of Medicine By Dr. S N Chugh	-	Chapter-2, Balanced Diet and Nutritional disorders	Definition, Etiology, Clinical features, Mortality and Management of Obesity	
17	Manual of Practical Medical Medicine By R. Alagappan	6 th Edition	Chapter-2, Nutrition	Types, Etiology, Pathogenesis, Prognosis and Management of Obesity	

Review as per Ayurveda

Definition and Pathogenesis:- Due to etiological factors, *Kapha dosha* gets aggravated and food remains uncooked and turn to more sweet, this *rasa dhatu* circulating throughout the body produce *Medas* because of its unctuousness is known as *Sthoulya*.

Etiological Factors:-

Excessive Eating, intake of heavy, cold, sweet, fatty food substances, *kapha vardhak* foods, drinks and activities, lack of physical exercise, day sleep, lack of sexual intercourse and mental exercise and intake of sweet substances by mother during pregnancy, defective gene.[22]

Clinical Features:-

Person can be diagnosed as *Sthoulya* when his buttocks, abdomen and breast begin to show movements due to excess accumulation of *Meda* in this area. Contrary to this age there is disproportionate in relation to build and enthusiasm [23]

Treatment:-

Heavy and non- nourishing diet useful to reduce *Sthoulya*.

Food and drinks that alleviate *Vata* and *Kapha* and reduce fat, enema with sharp, unctuous, and hot drug and unction with ununctuous drugs, use of *Guduchi*, *Musta*, *Triphala*, *Takrarinda* and Honey is recommended for the management of *Sthoulya*. [24]

Physical Activities:- One desirous of reducing *Sthoulya* should indulge more and more in vigil, sexual act, physical and mental exercises.

All causes that produce *Sthoulya* should be avoided if already developed, the person should make use of according to stipulated procedure, *Guggulu*, *Gomutra*, *Triphala*, *Lohbhasma*, *Rasanjana*, *Madhu* etc. which creates dryness and clear obstructed channel, indulge in physical exercise and resort to *Lekhan basti*. [25]

Review according to Modern Science**Definition:-**

Obesity is common disorder in which there is an excessive amount of body fat.

Incidence:-

According to WHO In 2016, more than 1.9 billion adults aged 18 years and older were Overweight or Obese [12]. The global burden of Obesity is recorded to be 4 million deaths and 40 million disability-adjusted life years among adults globally in 2015. The prevalence of Obesity in urban area of Maharashtra is 6.6% and 2.2%. The prevalence of Obesity in rural

area is 3.4% and 0.6%. The prevalence of Obesity is higher in urban area compared to rural area.

Pathogenesis and Aetiology:-

When calorie intake high, the excess calorie are stored in Adipose tissue and if this net positive energy remains prolonged will result to Obesity. This can arise in different ways and Obesity is a clinical sign of many disorders with several possible causes:-

- Age
- Hereditary and environmental factors
- Energy intake
- Drug as secondary cause of Obesity

Clinical Features and Complications:-

A majority of Obese patients do not seek medical advice unless or until they develop its complications. Gross Obesity produce mechanical and physical stress that aggravate or cause a number of disorders called its complications, which includes:-

1. Metabolic sequelae
2. Gastrointestinal consequences
3. Mechanical disabilities
4. Respiratory disorders
5. Cardiovascular disorders
6. Psychological consequences

Prognosis:-

Mortality rate is 25% higher if a person is 25% Obese and 50% higher if a person is 40% Obese.

Treatment:-

1. Diet therapy
2. Exercise
3. Drug treatment:- Peripheral acting drug- Adverse effects:- It causes fatty/ oily stool, flatus, faecal urgency and deficiency of fat soluble vitamins.
Endocannabinoid system:- Rimonoban-Adverse effects:- Neurological and psychiatric side effects.
4. Surgical treatment

5. Anti-Obesity drug should not be given to a patient with history of psychiatric illness.[26]

B. Procedure review

Procedure of massaging whole body below the neck in opposite direction to the orientation of hair with some pressure is called *Udvaartana*. *Sharira Parimarjana* is another name mentioned by *Acharya Charaka*.

2. *Chakrapani* defined it as a procedure done after *Abhyanga* in context of daily regimen.

3. Types of *Udvaartana*

- According to *Acharya Charaka*: Depending upon the variation in the therapeutic effect, it is of two types.

(a) *Snigdha Udvaartana*, Oil is used in procedure for treatment of *Krishha* (lean and thin) persons.

(b) *Rukhsha Udvaartana*, Dry powder of herbs with no addition of oil is used in procedure for treatment of *Sthula* (obese) persons.

- According to *Acharya Sushruta*: Depending upon the nature of drugs used, three different terms are mentioned by *Sushruta*. (a) *Udvaartana* (b) *Udgarshana*, in which dry powder of herbs like *Reetha* (*Sapindus Trifoliatius*) and *Ishtika Churna* (brick powder) is rubbed against the body. (c) *Utsadana*, in which *Sneha Kalka* (paste of herbs moistened with oil), is used during the procedure. It is also described in the context of *Shashthi Upkrama* by *Acharya Sushruta* and in *Dwivraniye Chikitsa* by *Acharya Charaka* as a measure to treat a *Vrana* (wound)

Materials Required *Abhyanga* (Massage) Table:

Herbal powder or oil as prescribed by the physician

Therapist(1)

Vessel (for powder/oil)

Choice Of Drug With Indications For *Udvaartana*:

Indications For *Ruksha Udvaartana*:

Kulatta Churna (powder): To reduce accumulated subcutaneous fat and to decrease excessive sweating

Kolkulattadi Churna: In Obese patients, Neurological conditions

Triphala Churna: In Obese patients, skin diseases

Nalpamaradi Churna: Eczema, Fungal infections, Diabetes mellitus associated with itching

Nimba Churna: Skin diseases *Ushira, Chandana, Musta, Padam Churna* Excessive sweating

Nimba, Khadira, Guduchi, Aragvada, Karanja Churna: Skin diseases

Procedure:

Application of medicated oil as indicated and dusting of herbal powder on the body followed by massage with some pressure in the direction opposite to that of hair is the main method adopted in *Udvaartana*.

Various steps involved in this procedure are:

- A. Preparation of the Patient: Ideal time for *Udvaartana* is the morning hour after evacuating the bowel and bladder. It should be performed empty stomach and before bath. Mild exercise may be advised to the patient before the procedure. Therapist should start the procedure after chanting prayer.
- B. Main Procedure: Patient wearing minimum cloths is advised to lie down on the *Abhyanga* table. There are four positions in which *Udvaartana* is carried out. These include supine, left lateral, prone and right lateral positions. At first, patient is advised to lie down in supine position and *Udvaartana* is done on the anterior part of the body. Second position is the left lateral position and *Udvaartana* is done on the right lateral aspect of the body. Third position is the prone position in which, posterior part of the body is treated with *Udvaartana*. At last, patient is advised to take right lateral position and *Udvaartana* is carried out in the left lateral aspect of the body. *Udvaartana* is done on each part of the body below the neck by exerting some pressure.

C. Duration Of *Udvaartana*:

Each part of body in their respective positions is massaged for 3-5 minutes. Usually the duration of *Udvaartana* is 30-45 minutes.

Post Procedural Activities:

Patient is advised to take rest for at least 15 minutes. Patient is allowed to take bath with lukewarm water after an interval of minimum 1 hour.

Care And Precautions:

Before *Udvaartana*, bladder and bowel should be emptied. It is to be done in the direction opposite to that of the hair. Type of massage on different parts of the body and position of the patient during the procedure should be followed strictly.

Indications and choice of drug to be used should be assessed before *Udvaartana*. Tender areas should be avoided for *Udvaartana*. Precaution should be taken while dusting the powder over the body. It is advisable to protect face, nose and eyes to prevent irritation.

Aseptic measures should be taken if patient is suffering from any contagious disease.[27]

Contra-indications of *Udvartana*:-

Udvartana is never used at night, regardless of patient's state of mind. There are also specific conditions under which dry massage techniques should not be used- for example when a person is weak or incapacitated, is frail and elderly, is worried or anxious or in an extreme emotional state, has an eating disorder or is emaciated, has a tendency to bleed easily, or has thin or frail skin. *Udvartana* should be avoided when *Vata* is dominant in either *prakruti* or *vikruti*. [28]

Advantages of *Udvartana*

Udvartana has *Kapha-Meda vilayana* property. To enhance the *Medovilayana* property, *Katu-Tikta rasa* (pungent-bitter); *Ushnavirya*; *LaghuRuksha-Tikshna guna dravyas* are present. *Twakastha agni* gets stimulated, this leads to absorption and digestion of the drug and further does *Pravilayana* of *Medha Dhatu* (liquefaction of subcutaneous fat) below skin may occur. In *Sthoulya* there is increase in *vikruta Meda Dhatu* which increases *Kleda*. Due to *kleda*, *srotas* (channels) get obstructed and *abaddha Meda Dhatu* (loose fat) is formed. This may lead to *Dhatu agni mandya* (decreased molecular level fire of *MedaDhatu*). Due to *Ushna, Tikshna, Laghu* property of the *Dravya* and procedure, it acts as *Medahara*. Due to *Ruksha guna* of *Dravya* and *Ruksha Udvartana*, *kleda* gets absorbed (*Shoshane Ruksha*|| *Hemadri*) Thus *Abaddhatva of Meda* and *Kapha* might have reduced.

C. Drug Review

Panchagavya The combination of *Godugdha* (cow milk), *Godadhi* (curd), *Goghrita* (cow ghee), *Gomutra* (cow urine), *Gomaya* (cow-dung) in equal quantities is called "*Panchagavya*".

It is beneficial in the following diseases: - Specially,

- 1) Epilepsy
- 2) Swelling
- 3) Fever
- 4) Jaundice
- 5) Cough

GOMAYA

Synonyms: - *Govit, Goshakrit, Gopurisham, Govishtha, Gomalam.*

Sanskrit *Gomaya*

Marathi *Gāiche shen*

Hindi *Gobar*

English *Cow dung*

Properties

Guna - *Laghu,*

Rasa - Kasay, Tikta,

Vipak - Katu

Virya - Ushna,

Prabhav - Rakshoghna ,

Doshagnata - Kaphashamak

Gomaya consumption is beneficial in the following diseases : -

- ♣ Asthma
- ♣ Cough
- ♣ Hiccough
- ♣ Eye disorders
- ♣ Mouth disorders
- ♣ Obesity

Dose: 4-6g along with lukewarm water

Rodhradi Gana

It includes *Rodhra, Saavar Rodhra, Palaash, Kutannat, Ashoka, Fanji, Katphal, Elvaaluk, Shallaki, Jingani, Kadamb, Saal, and Kadli.*

Properties of *Rodhradi Gana*

Kapha-meda Naashak

Yoni-doshahar

Sthambhaniya,

Vraniya

Vishnaashak

2.1] Previous works done:

2.1.1] List of published articles with brief conclusions:

S.n	Details of articles	Conclusion are drawn
1.	Dr. Shweta Parwe, Effect of <i>Rodhradi gana udvartana</i> in management of <i>Sthoulya</i> (Overweight) with special refrence to Obesity. Article in International Journal of Pharma and Bio Sciences- MAY 2021.	<i>Rodhradi gana udvartana</i> resulted in <i>Sthoulya</i> and had a critical for obese patients.
2.	Vyas Kruti Yagnesh kumar, Antihyperlipidemic activity of <i>Navaka Guggulu</i> prepared with fresh (Naveena) and old (Purana) <i>Guggulu</i> : A randomized clinical trial, Medical Journal of Dr.D.Y.Patil Vidyapith, 2017. Volume : 10, Issue : 3 , Page : 235-245[14]	<i>Navaka Guggulu</i> prepared from 3-year-old (Purana) sample is better antihyperlipidemic agent against fresh (Naveena) sample.
3.	Bilyan Anchal et al, Clinical study on the Efficacy & safety of <i>Tryushnadi Guggulu</i> in <i>Medoroga</i> (Dyslipidemia), World Journal of Pharmaceutical Research, volume 5, Issue 4, 2016[13]	<i>Tryushnadi Guggulu</i> showed statistically highly significant results in <i>Trishna, Atinidra, Atikshudha, Alpaprana, Lipid proile, Body weight, Weight Hip ratio</i> . So it concluded that <i>Tryushnadi Guggulu</i> can be used as effective and safe treatment for Dyslipidemia (<i>Medoroga</i>).
4.	Chhabra Shailly, A comparative clinical study of the efficacy of <i>Amritadya</i>	Treatment modality <i>Amritadya Guggulu</i> with <i>Triphala Kwatha</i> shows better efficacy

	<i>Guggulu</i> with <i>Triphala Kwatha</i> and with <i>Madhudak</i> in the management of <i>Medoroga</i> (Obesity), International Journal of Ayurvedic and Herbal Medicine, 5:6 (2015) [10]	in reliving subjective and objective features (<i>Atikshudha</i> , <i>Atipipasa</i> , <i>Daurbalya</i> , <i>Swedadhikya</i> , <i>Atinidra</i> , <i>Alasya</i> , <i>Kshudrashwasa</i> , <i>Chalaspika</i> , <i>Udar Stana</i> , Weight, B.M.I., Skin Fold Thickness, Weight Hip ratio) than <i>Amritadya Guggulu</i> with lukewarm water.
5.	Parashar Rakesh, A clinical evaluation and comparative study of <i>Loha Rasayana</i> and <i>Tryushnadya Loha</i> in management of <i>Sthoulya</i> (Obesity), IJAR, 2015 1(9)	<i>Loha Rasayana</i> is more beneficial as compare to <i>Tryushnadya Loha</i> in <i>Sthoulya</i> disease.
6.	Mandalkar Pramod, A clinical study of <i>Trushanadhya Loha Vati</i> in the management of <i>Sthoulya</i> w.s.r. to Obesity, International Ayurvedic Medical Journal, vol 3; Issue 11, November-2015(9)	<i>Tryushnadya Lauha Vati</i> shows marked improvement in 40 % patient (in <i>Udarchalatva</i> , <i>Kshudraswasa</i> and <i>Krathana</i>), and moderate improvement in 60 % patient & <i>Navaka Guggulu</i> shows 30% marked improvement (<i>Udarchalatva</i> , <i>Kshudraswasa</i>), 40% moderate & 30 % mild improvement. So by compairing overall effect <i>Tryushnadhya Lauha Vati</i> has shown better results than <i>Navaka Guggulu</i> .
7.	S.A.U.S.K. Jayasiri, A Comparative Clinical study on the efficacy of <i>Navaka Guggulu</i> and <i>Amritadya Guggulu</i> in the management of <i>Sthoulya</i> (Overweight & Obesity), Indian Journal of Ancient Medicine and Yoga, Vol-7 No.1, 2014	<i>Navaka Guggulu</i> and <i>Amritadya Guggulu</i> is more or less similar to that of when considering their pharmaco therapeutic properties. Both the drugs regulate <i>Jatharagni</i> , check the excessive growth and accumulation of <i>Medodhatu</i> and there by <i>Sthoulya</i> is improved.

2.2] Research Gaps Analysis:

Considering increasing prevalence rate of *Sthoulya* (Obesity) in current era due to unhealthy lifestyle, it is highly imperative to adopt simple measures to treat and prevent it.

In *Ayurvedic* literature regarding management of *Sthoulya* (Obesity), it is observed that extensive work has been carried out regarding efficacy of various treatment measures in *Ayurveda*. However, these measures have certain limitations. Among *Panchakarma*, through *Vamana* and *Virechana* offers significant results in weight reduction, many patients have poor compliance rate towards the consumption of medicated ghee prior administration of these procedure that is their mandatory criteria. There is also misbelief about lipid elevating effects of these medicated ghee. Therefore, obese patients get deprived from their miraculous results. Moreover, most of patients are reluctant and deny to undergo *Vasti (Medicated Vasti)* e.g. *Lekhana vasti* due to hesitancy. There is also many apprehension regarding *vasti* formulations which contains many herbo-mineral combinations, those may adversely affect over liver and kidney. Therefore, external treatment are quite popular among society for the management of this clinical condition. *Udavartna* i.e. dry powder massage is considered as best therapy for encouraging result in inches loss. Many study has been carried out regarding *Sthoulya* (Obesity) treatment but research work on *Gomaya Mashi udvartana* in *Sthoulya* (Obesity) and comparative study is not done yet. In India, there are many rural areas and villages, where cows kept for milk and dairy product purposes. Thus, the cow dung can easily be procured from such rural areas and villages at a very low cost as compared to other herbal drugs, for which one has to search a lot and also the herbal drugs are costly enough for one's reach.

Hence, this study is planned to study comparative efficacy of *Rodhradi Gana Udvartana with Petiswedana* and *Gomaya Mashi Udvartana with Petiswedana* in the management of *Sthoulya* (obesity).

Previous Work Done related to the procedure

1. Dr. Shriram Shivajirao Ragad, A CASE STUDY OF *MADHUTAILIKA BASTI* AND *UDVARTANA* IN *MEDOROGA* WITH SPECIAL REFERENCE TO OBESITY, 2020
2. Preeti S Chaudhary, Jaiprakash Ukey, Pratibha Kokate, Demendra Kumar Thakre, Jawahar Rahangdale, REVIEW ON THERAPY OF *UDVARTANA* IN THE MANAGEMENT OF *STHOULYA* (OBESITY), 2020

3. Dr. Shweta Parwe , Milind Nisargandha* , Piyush Bhagwa, Study the effect of *Rodhradi Gana Basti* and *Udvardana* in *Sthoulya* (Obesity): A Study Protocol, 2020
4. Chaitralakshmi K N, Jairaj P Basarigidad, A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFECT OF *HARIDRADI GANA CHURNA* AND *TRIPHALA CHURNA UDVARTANA* IN *STHOULYA* (OBESITY), 2019
5. Jayashankar Mund , Ramakant Dwivedi, Role of *Udvardan Chikitsa* and *Navak Gugullu* in Obesity: A Case Study, 2019
6. A.M.S.L. Chandrasiri, E.R.H.S.S. Ediriweera, Effect of *El-Vireka*, *Mudgadi Kashaya* and *Triphala Udvardana* in *Athisthaulya* (Obesity) - A case study, 2019
7. Manjunath Akki, Suresh Hakkandi, Abid Hussain, A COMPARATIVE CLINICAL STUDY ON THE EFFECT OF *UDVARTANA* AND TUMMY TRIMMER IN *UDARALAMBANATVA* W. S. R CENTRAL OBESITY, 2019
8. Dr. Prajakta S. Bodkhe, REVIEW ON *AYURVEDIC* MANAGEMENT FOR OBESITY (*STHOULYA*), 2019
9. Monica Aggarwal, AN OVERVIEW OF *AYURVEDIC* MANAGEMENT OF *STHAULYA* W.S.R OBESITY, 2019
10. Munzni NR, A Study to evaluate the effect of the *Vamana Karma Virechana Karma* and *Udvardana* in the management of *Sthaulya* wsr to Obesity, 2018
11. Dr. Bhingardive Kamini B.* , Dr. Sarvade Dattatray , Dr. Santoshkumar Bhatted, TO EVALUATE THE EFFICACY OF *LEKHANA BASTI* & *UDVARTANA* IN THE MANAGEMENT OF POST SURGICAL OBESITY: A CASE STUDY, 2015
12. Vinayak Venkatappa and Suchitra Patil, Effect of *Udvardana* (Powder Massage) On Obesity, 2014

3] AIM AND OBJECTIVES

3.1] Aim:

Evaluation of Comparative efficacy of *Rodhradi Gana Udvardana* with *Petiswedana* and *Gomaya Mashi Udvardana* with *Petiswedana* in the management of *Sthoulya* (obesity).

3.2] Objectives:

- To assess & compare the efficacy of *Rodhradi Gana Udvartana with Petiswedana and Gomaya Mashi Udvartana with Petiswedana* over Weight in Kg & B.M.I. in Obesity
- To assess & compare the efficacy of *Rodhradi Gana Udvartana with Petiswedana and Gomaya Mashi Udvartana with Petiswedana* over anthropometric parameters or measurements e.g. Mid arm circumference, abdominal circumference, Mid thigh circumference, Waist-Hip Ratio, & Skin fold thickness in Obesity.
- To assess & compare the efficacy *Rodhradi Gana Udvartana with Petiswedana and Gomaya Mashi Udvartana with Petiswedana* over biochemical parameter e.g. Serum Lipid Profile in Obesity

4] MATERIAL AND METHODS

4.1] Source of Data: Place: The Subjects will be recruited from *Panchakarma* OPD and IPD of Mahatma Gandhi Ayurveda College, Hospital & Research Centre, Salod (H), Wardha.

4.2] Type of Study:

Interventional Study

4.3] Study design:

Randomized single blind controlled clinical Trial

4.4] Drug collection/ authentication:

The Raw material will be Procured from local market and Go-Vigyan *Anusandhan Kendra* (Devalapur), the Drugs will be identified and authenticated by Department of *Dravayguna & Rasashastra* of MGACH & RC, Salod(H), Wardha. Storage -:Glass container

4.5] Toxicity studies:

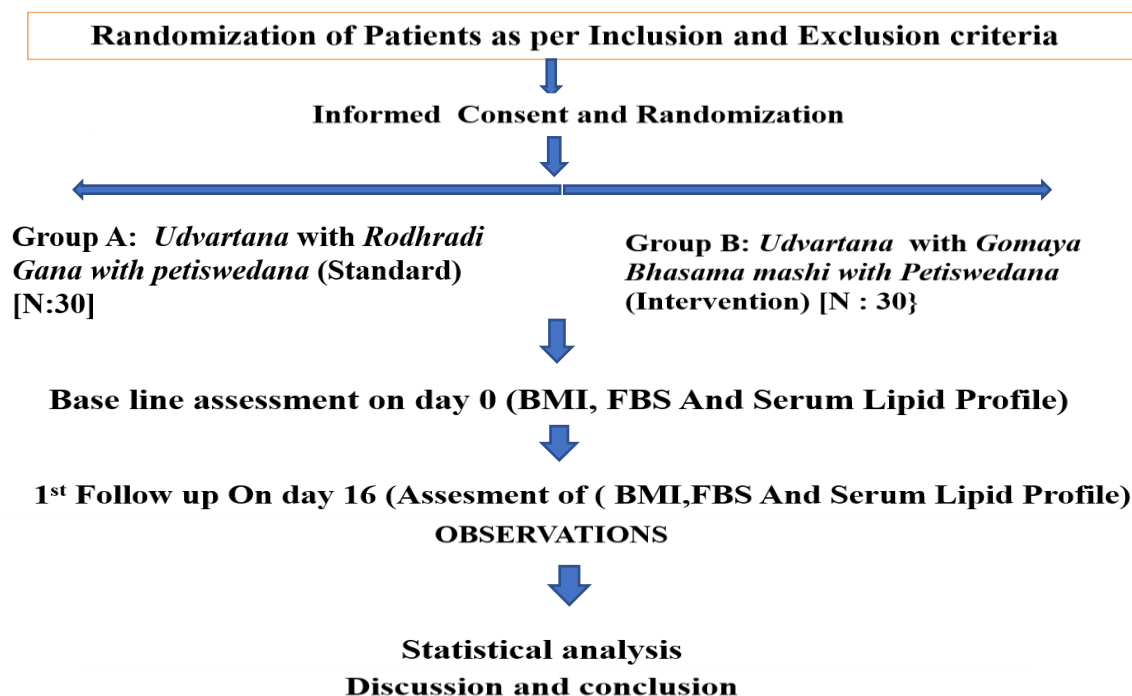
As, the *Gomaya Mashi* is being used for external purpose as *Udvartana* procedure and not used internally, so, it is totally safe to use and does not possess any toxic effects on the body.

4.6]Methodology

PICO model:

1	P	Recently diagnosed case of Obesity
2	I	<i>Udvaratna with Gomaya Mashi</i>
3	C	<i>Udvaratna with powder of Rodharadi Gana</i>
4	O	Reduction in Body Weight, B.M.I., Anthropometric measurements, serum lipid profile

Study Design:



4.5] Sampling procedure:

Simple Randomization by computerized generated table

4.6] Sample size (Including sample size calculation):

30 in each group

4.7] Grouping & Posology: (As per PICO model)

Group	Sample Size	Intervention	Quantity and Frequency	Duration	Follow up
A	30	<i>Udvaartana</i> with <i>Rodhradi Gana</i> with <i>Petiswedana</i>	100 gm Daily once	15 days	0day (base line) 16 th day
B	30	<i>Udvaartana</i> with <i>Gomaya Mashi</i> with <i>Petiswedana</i>	100 gm Daily once	15 days	0day (base line) 16 th day

4.8] Data collection tools and process:

- Case record form

4.8.1] Inclusion criteria:

ICD Criteria for obesity

- Patients having B.M.I. of 40 kg/m² or more is morbid obesity
- Patients having B.M.I. of 35.0 to 39.9 kg/m² plus at least one significant related comorbidity is severe obesity.
- Patients having B.M.I. of 35.0 to 39.9 kg/m² without comorbidity is obesity.
- Patients having B.M.I. of 30.0 to 34.9 kg/m² is obesity.

1. Subjects between age group of 20-40 years of either sex.
2. Subjects having B.M.I. >25-40 kg/m²
3. Subjects willing to participate in the study and sign the consent form

4.8.2] Exclusion criteria:

1. K/c/o Hypothyroidism, Diabetes mellitus, Cardiovascular, Renal Disorder and Drug induced Obesity etc.
2. Pregnant lady and Lactating mother.
3. Individuals showing unsuitability of Drug or ADR
4. Not willing to continue due to any reason
5. Any other illness developed during treatment
6. Patient contraindicated for *Udvaartana* and *Peti swedana* [28]

4.8.3] Assessment Criteria:**a) Objective**

The following Anthropometric assessment will be done before & after the treatment using weighing machine & measuring tape;

1. Body Weight of the patient in kg (Weight will be taken on empty stomach with same cloths)
2. B.M.I.(International criteria of B.M.I. have been calculated by following formula.)
3. Anthropometric Assessment/ **Body circumference** (The girth measurements of certain regions(*Chest- Abdomen – Hip – Mid thigh –Mid arm*) using measuring tape before and after theTreatment of following areas where generally the adiposity is found more will be taken)
 - ❖ Chest circumference – In normal expansion at the level of nipple.
 - ❖ Abdomen circumference – At the level of umbilicus
 - ❖ Hip circumference – At the level of highest point of distension of buttock.
 - ❖ Mid thigh circumference – Mid of the thigh between pelvic and knee joints
 - ❖ Mid arm circumference – Mid of the arm between shoulder joint and elbow joint.

(In case of all circumferences, measurements, the mean values will be taken before and after treatment) The body wt. will also be taken before and after treatment.

 - ❖ Waist-Hip Ratio
4. **Biochemical Test**
 - ❖ Lipid profile (S. Total cholesterol, S. triglycerides, S. HDL, L.D.L,V.L.D.L)

4.10] Investigations:

Screening investigations (base line) :

Fasting Blood Sugar

5] ANALYSIS PLAN:**A] Data Analysis (statistical methods):**

- Data having Normal Distribution will be done by paired & unpaired t test

6] Observation and results:

Data obtained from the follow up chart and other observations will be used and the results will be drawn on the basis of various charts, graphs, and tables. To verify the significance of the results:

Reduction in Body Weight by..... Kg, B.M.I by.....Kg/m² , Anthropometric measurements (each in cms) , Skin fold thickness (each in cms) after intervention will be considered as Significant

7] Discussion and Conclusions:

Will be based on observation and results obtained.

8] Scope and Implications of the proposed study:

If *Gomaya Mashi Udvartana* is effective in reducing body weight and lipid levels, then the clinical evidence with simple, safe, cost-effective and effective formulation can be generated for the management of *Sthoulya* (Obesity). It will be helpful in metabolic disorders like Obesity and Dyslipidemia.

9] Ethical consideration:

After obtaining ethical clearance from IEC, Mahatma Gandhi Ayurved College, Salod, Wardha; study will be started.

10.] Gantt chart (in Quarterly based, only for long term project, PG and PhD synopsis

Scholar/ Investigator	Dr. Shubham Verma					
Title	Comparative Evaluation of Efficacy of <i>Gomaya Mashi Udvartana</i> with <i>Petiswedana</i> And <i>Gomaya Mashi Udvartana</i> with <i>Petiswedana</i> In The Management of <i>Sthoulya</i> (Obesity)					
Steps	Q1	Q2	Q3	Q4	Q5	Q6
Approval from IEC						
Review of Literature						
Drug Preparation						
Enrolment of the patients						
Data Collection						
Statistical Analysis						
Thesis writing						
Submission						

Budget Proposal:**Mahatma Gandhi Ayurveda College Hospital & Research Centre****Salod [H], Wardha 442004, Maharashtra.****Department of Panchakarma****Title:****Comparative Evaluation of *Dashamooladi Yamaka Sneha* and *Shuddha Bala Taila Nasya* in the Management of *Vishwachi* (Cervical Radiculopathy)**

Sr no.	Heads	Specification	Amount / unit in INR	Quantity	Total amount/ INR	Justification
1.	<i>Rodhra</i> <i>Palash</i> <i>Shyonak</i> <i>Ashok</i> <i>Bharangi</i> <i>Kaiphala</i> <i>Elvaluk</i> <i>Shallaki</i> <i>Jingani</i> <i>Kadamb</i> <i>Sala</i> <i>Kadli</i> <i>Gomaya</i>	<i>Choorna</i>	Rs. 250/kg Rs. 100/kg Rs. 4000/kg Rs. 250/kg. Rs. 300/kg. Rs. 700/kg. Rs. 600/kg Rs. 700/kg Rs. 800/kg Rs.300/kg Rs.100/kg Rs.1200/kg Rs. 30/kg	30 Pts. 30 Pts.	Rs. 34800 Rs.13500	Dry form will be taken for the churna
2.	Procedure Charges	<i>Udavartana</i> <i>Peti Sweda</i>	Rs. 90/- Rs. 20/-	60 Pts.	Rs. 81,000/- Rs. 18,000/-	--
3.	Investigations	Serum lipid profile FBS	Rs. 350/- Rs. 50/-	120 Pts. 120 Pts.	Rs. 42,000/- Rs. 6000/-	--
Total					Rs.1,95,300/-	

Guide**Dr. Punam sawarkar****HOD****Dr. Shweta Parwe**

References

1. D. R. Wagner and V. H. Heyward, "Techniques of body composition assessment: a review of laboratory and field methods," *Research Quarterly for Exercise and Sport*, vol. 70, no. 2, pp. 135–149, 1999. View at: [Publisher Site](#) | [Google Scholar](#)
2. 2014, Control CfD Prevention. Overweight or obesity: adult obesity facts.
3. E. S. Kasu, A. Ayim, and J. Tampouri, "Assessment health care services among health care workers in holy Karbala governorate," *Journal of Biology, Agriculture and Healthcare*, vol. 5, 2015. View at: [Google Scholar](#)
4. World Health Organization, *Obesity: Preventing and Managing the Global Epidemic*, World Health Organization, Geneva, Switzerland, 2000.
5. J. S. Tabrizi, H. Sadeghi-Bazargani, M. Farahbakhsh, L. Nikniaz, and Z. Nikniaz, "Prevalence and associated factors of prehypertension and hypertension in Iranian population: the lifestyle promotion project (LPP)," *PLoS One*, vol. 11, no. 10, Article ID e0165264, 2016. View at: [Publisher Site](#) | [Google Scholar](#)
6. World Health Organization, *Waist circumference and waist-hip ratio: report of a WHO expert consultation*, World Health Organization, Geneva, Switzerland, 2008.
7. H. B. Hubert, M. Feinleib, P. M. McNamara, and W. P. Castelli, "Obesity as an independent risk factor for cardiovascular disease: a 26-year follow-up of participants in the Framingham Heart Study," *Circulation*, vol. 67, no. 5, pp. 968–977, 1983. View at: [Publisher Site](#) | [Google Scholar](#)
8. E. E. Calle, C. Rodriguez, K. Walker-Thurmond, and M. J. Thun, "Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. Adults," *New England Journal of Medicine*, vol. 348, no. 17, pp. 1625–1638, 2003. View at: [Publisher Site](#) | [Google Scholar](#)
9. A. Molarius and J. Seidell, "Selection of anthropometric indicators for classification of abdominal fatness- a critical review," *International Journal of Obesity*, vol. 22, no. 8, pp. 719–727, 1998. View at: [Publisher Site](#) | [Google Scholar](#)
10. C. Kragelund and T. Omland, "A farewell to body-mass index?" *The Lancet*, vol. 366, no. 9497, pp. 1589–1591, 2005. View at: [Publisher Site](#) | [Google Scholar](#)

11. J. R. Sowers, "Obesity as a cardiovascular risk factor," *The American Journal of Medicine*, vol. 115, no. 8, pp. 37–41, 2003. View at: [Publisher Site](#) | [Google Scholar](#)
12. World Health Organization, 2018, <http://www.who.int/news-room/factsheets/detail/obesity-and-overweight>.
13. G. B. D. O. Collaborators, A. Afshin, M. H. Forouzanfar et al., "Health effects of overweight or obesity in 195 countries over 25 years," *The New England Journal of Medicine*, vol. 377, no. 1, pp. 13–27, 2017. View at: [Google Scholar](#)
14. Minhajuddin Ahmed, Kuldeep Shah, Vinayak Yadavrao Kshirsagar, Prevalence and risk factor for obesity in urban and rural school going children of Karad taluka, Maharashtra, India, 2016
15. [Rajeev Ahirwar](#), [Prakash Ranjan Mondal](#) Prevalence of obesity in India: A systematic review, 2018.
16. Textbook of Medicine by Dr. S.N. Chugh- Aetiology of Obesity
17. C. G. Victora, L. Adair, C. Fall et al., "Maternal and child undernutrition: consequences for adult health and human capital," *The Lancet*, vol. 371, no. 9609, pp. 340–357, 2008. View at: [Publisher Site](#) | [Google Scholar](#)
18. Manual of Practical Medicine by R. Alagappan, Management of Obesity.
19. Srikantha Murthy K.R., Bhavprakasha of Bhavmishra, Chawkhamba KrishnadasAcademy Varanasi, 5th edition reprint 2015 Vol.2, Madhyam Khanda chapter-39, shloka 1-5, pg.502
20. Srikantha Murthy K.R., Bhavprakasha of Bhavmishra, Chawkhamba KrishnadasAcademy Varanasi, 5th edition reprint 2015 Vol.2, Madhyam Khanda chapter-39, shloka 1-5, pg.502
21. Davidson's Principles & Practice of Medicine, 21st edition, reprinted 2010, Elsevier limited publication, edited by Nicki R. Colledge, Brian R Walker, Stuart Ralston, Chapter 5 environmental & nutritional factors in disease, pg.116
22. Ambika Dutta Shastri Sushrut Samhita Sutra Sthan- 15/32
23. Khemraj Shrikrishna Das BhavPrakash Madhyam Khand-39/9-10
24. Kashinaath Shastri Charak Samhita Sutra Sthan-21/20
25. Ambika Dutta Shastri Sushrut Samhita Sutra Sthan- 15/32

26. Textbook of Medicine by Dr. S.N. Chugh- Chapter-2, Balanced diet and Nutritional disorders,Unit-9, Obesity
27. Dr. Gopesh Mangal, Jatinder Verma, Pravesh Srivastava, Dr. Gunjan Garg, Udvardana (Ayurvedic Powdered Massage) : A Review Article, 2019
28. Modalities for Massage and Bodywork - E-Book, Chapter-2, Ayurvedic Therapies.