



## A Clinical Study of Management of Medovruddhi [Obesity] By Haridryadi Gana.

<sup>1</sup>Dr Sandesh Goje , <sup>2</sup>Dr Sumedh Wasnik

<sup>1</sup>Pg Scholar, Dept Of Panchakarma, M.S.Ayurved College, Gondia,

<sup>2</sup>Professor & Head, Dept.Of Shalya, Pmt Ayurved College, Shevgaon, Dist Ahmednagar, Maharashtra State

### ABSTRACT

Obesity is a burning issue before medical science. It is a penalty of today's life style. If we follow daily and seasonal routine as advocated by Ayurveda, we can prevent as well as overcome various life style induced problems. Though the problem comes, we have an answer it by Ayurved management. Obesity leads to many serious issues such as hypertension, hyperlipidemia, ischemic heart diseases, diabetes, renal dysfunctions, infertility and even brain disorders. In various ayurved texts, obesity is described as medovruddhi as a separate entity and cause & complication of other diseases. In the management of medovruddhi, many acharyas have mentioned various formulations among which we selected Haridryadi gana for the study which was found to be very significant.

### INTRODUCTION

In this Recent Era it is to be found that each and every person is running towards his life's goal and achievement. So they are completely get ignored and do not think about their health by adopting sedentary life style, psychological factors, excessive intake of oily and fatty food, bad habits etc. Due to this artificial living life style, persons have forgotten to follow the proper Dinacharya, Ritucharya, Dietetic Rules and Regulations. Due to such living life-style, persons have gotten so many disorders for themselves. Medovruddhi (obesity) is one of them.

Obesity is found to be basics of so many disorders. It provides the platform for so many hazards like H.T., C.H.D., D.M., O.A. infertility, impotency as well as psychological disorders like stress, anxiety, depression etc. Thus, the mortality and morbidity are more in obese person compared to others. Excessive weight creates serious and fatal health problems as well as social and emotional problems to well being resulting increased morbidity and mortality rate. Dyslipidemia being major factor in obesity results in atherosclerosis. Due to deposition of cholesterol in the lumen of arteries leads to heart, kidney and brain disorders. Hence treatment of obesity is necessary to prevent these various risk factors. In developed countries approximately 20 to 40% of adults and 10 to 20% of children are found to be affected by this obesity. Total health care expenditure for obesity patients is 2-8%.

**Rationale of study:** - The various changing pattern of diet and food such disorder namely obesity are on high incidence. It results of lack of physical activities with increased intake of daily diet results into the clinical conditions, called as obesity. Obesity is gaining more and more attention at the globally. That's why so many countries are making an effort to find out the perfect remedy for this burning problem. However, still today there isn't found any effective medicine in modern medical Science.

**Prevalence:** - The World Health Organization has described obesity as one of today's most neglected public health problems, affecting every region of the globe.

A study published in the noted medical journal Lancet says India is just behind US and China in this global hazard list of top 10 countries with highest number of obese people. India is under siege, junk food, alcohol and sedentary lifestyle are leading us to silent selfdestruction, making one in every five Indian men and women either obese or overweight. A systematic analysis for the Global Burden of Disease Study 2013' – used data collected by international bodies and organizations in various countries like India over three decades. The US topped the list with 13 -per cent of the obese people worldwide in 2013, while China and India together accounted for 15 per cent of the world's obese population, with 46 million and 30 million obese people, respectively.

Overweight in adults is categorized as Body Mass Index of 25 kg/m<sup>2</sup> to 30 kg/m<sup>2</sup> and obesity as Body Mass Index of more than 30 kg/m<sup>2</sup>. In 2010, overweight and obesity were estimated to cause 3 to 4 million deaths, 3.9 per cent of years of life lost, and 3.8 per cent of disability-adjusted life-years worldwide, the study said.

4 Overweight in adults is categorized as Body Mass Index of 25 kg/m<sup>2</sup> to 30 kg/m<sup>2</sup> and obesity as Body Mass Index of more than 30 kg/m<sup>2</sup>. In 2010, overweight and obesity were estimated to cause 3 to 4 million deaths, 3.9 per cent of years of life lost, and 3.8 per cent of disability-adjusted life-years worldwide, the study said.

5 According to the National Family Health Survey (NFHS), the percentage of ever-married women aged 15-49 years who are overweight or obese increased from 11% in NFHS- 2 to 15% in NFHS-3. Under nutrition is more prevalent in rural areas, whereas overweight and obesity are more than three times higher in urban areas. This may be due to lesser physical activity in the urban areas.

2. Need of study: - Being a symptomatic approach and limited relief with troublesome side effects to the human beings which are suffering from obesity, modern medical science & its management have enough scope to workout on its aetiopathological and management aspect of the obesity. So mankind hopes to search the perfect remedy from Ayurveda by its holistic approach. As per Ayurveda concern, Obesity has been described very earlier here in various Bruhattrayee as well as Laghutrayee, Samhitas, Sangraha granthas, Nighantu, etc. as Charaka has described Sthaulya among the Ashtanindit diseases (Ch. Su. 21) and Samtarpanajanita roga (Ch. Su. 23). In pathogenesis of Sthaulya, Kapha (Kledak Kapha), Vata (Samana & Vyana Vayu), Meda (fat /lipid) and Medodhatvagni Mandyata are main responsible factors. So that type of therapy should be selected, which effect on all these factors? Also the basic and fundamental ethics of ayurveda is “**Nidan parivarjan & Samprapti vighatan chikitsa**” keeping this in consideration in mind, the present study has been planned. With this to be a social and noble aspect towards society it's our kind responsibility to give cost effective, no side effects, easily available everywhere ayurvedic remedy for Medovridhhi (obesity). Many research works has been conducted by Research Scholars to get relief from this condition, obesity. Now this work is a humble effort to elicit and validate the efficacy of Haridradi gana in the management of Medovridhhi (Sthaulya). Above said drugs are already - mentioned by our Acharya in Ashtang Hridaya sanshodhanadi ganasangraha addhay no. 15 Shlok no.35-36. So this study is and attempts to find a better solution in our Ayurveda for the treatment of Medovridhhi with special reference to obesity.

#### **4. AIMS AND OBJECTIVES: -**

**AIMS:-** To study the efficacy of Haridradi gana in the management of Medovridhhi (Obesity).

#### **OBJECTIVES: -**

1. To study of literature on Medovridhhi (Obesity) as per Ayurveda and modern aspects.
2. To establish a correlation between Medovridhhi and Obesity.

3. To study & assess the following involvement in the pathogenesis of Medovridhhi: - a) Dosha b) Dushya c) Strotas d) Samprapti.
4. To provide better availability, easily acceptable, cost effective and impressive treatment therapy for Medovridhhi.
5. Any new theoretical and practical concept if found in the management of Medovridhhi will be noted.

#### **MATERIALS AND METHOD: -**

**Clinical Study :-** Clinical study is the main part of research work is clinical study. Systemic procedure and unbiased study may enhance the research work.

**Study design: -** An Open Randomized Control Clinical trial.

#### **MATERIALS: -**

1. Study of Meda, Medovridhhi, Medoroga, Atisthaulya and Obesity according to Ayurvedic and modern Literatures and concepts.
2. Study of literature on the drug 'Haridradi gana' and 'Vachadi gana' and its contents.
3. Selection of patients from O.P.D. and I.P.D. in department of Kayachikitsa of our Hospital will be selected for the study.
4. Randomly selected 60 patients suffering from Medovridhhi (obesity) which is divided into two groups i.e. Group A (Trial Group) and Group B. (Control Group).
5. Clinical, anthropometric and laboratory study of patients will be incorporated.
6. Selection of Drug: Haridradi gana and Vachadi gana for Group A (Trial Group) and Group B. (Control Group) respectively.

**METHODS: -** This is an open randomized control clinical study on Haridradi gana for Group A as a Trial Group and Vachadi gana for Group B as a Control Group in management of Medovridhhi (obesity), which was carried out in the O.P.D./I.P.D. of Dept. of Kayachikitsa patients were diagnosed on the basis of clinical signs and symptoms described in Ayurved and Modern medicine.

**NUMBER OF GROUPS: -** The patients selected for the study were grouped into 2 groups i.e. Group-A (Trial Group) and Group-B (Control Group) on random basis each containing 30 patients which is been carried out by using lottery method. Separate regimens of treatment also been prescribed.

**Haridradi gana: -** In Ashtang Hridaya Sutrasthan chapter fifteen i.e. 'Shodhanadi Gana Sangrahadhyaya' Vagbhat has mentioned 'Haridradi gana' for Meda-kapha vridhhi which contains five drugs viz. Haridra(Curcuma Longa), Daruharidra (Berberis aristata), Yashtimadhu(Glyzeria glabra), Prushniparni (Uriria picta) and Indrayav (Hollereena antidysentrica).

#### **DURATION OF STUDY: -**

- a. Group A – kwath of Haridradi gana had been given for 60 days.
- b. Group B - kwath of Vachadi gana had been given for 60 days.
- c. Total duration of study was for 60 days.
- d. Assessment had been taken on Day 0, 15<sup>th</sup>, 30<sup>th</sup>, 45<sup>th</sup> and Day 60.

Sr. No.	Drug of Haridradi gana	Quantity	Drug of Vachadi gana	Quantity
1	Haridra	1 Part	Vacha	1 Part
2	Daruharidra	1 Part	Nagarmotha	1 Part

3	Yashtimadhu	1 Part	Devdaru	1 Part
4	Prushaniparni	1 Part	Sunthi	1 Part
5	Indrajav	1 Part	Atish	1 Part
6	Water	16 Part	Haritaki	1 Part
			Water	16 Part

## DRUG REVIEW: -

### Drug, Dose and Duration:-

Following Drugs, Doses & Durations will be used to study.

	<b>Group-A</b>	<b>Group-B</b>
• <b>Drug</b>	-Haridradi gana kwath	Vachadi gana kwath
• <b>Dose</b>	-40ml twice a day	40ml twice day
• <b>Aushadhi Sevan Kaal</b>	- Pragbhakta	Pragbhakta
• <b>Anupan</b>	-Koshna jal	Koshna jal
• <b>Route of administration</b>	-Oral	Oral
• <b>Duration</b>	-60 days	60 days

The method used for preparation of kwath was as described in Sharangdhara samhita.

## INCUSION CRITERIA: -

### A) Subjective criteria: -

- 1) Age – 16 – 60 yrs.
- 2) Patients of both sex included.
- 3) Irrespective of caste and religion.
- 4) Irrespective of socioeconomic status.

### Symptoms: -

- 1) Kshudra Shwas (Shortness of breath on exertion)
- 2) Kshudhatimatra (Excessive hunger)
- 3) Pipasadhikya (Excessive thirst -)
- 4) Swedadhikya (Excessive sweat)
- 5) Atinidra (Excessive sleep)
- 6) Daurgandhya (Bad body odor)
- 7) Daurbalya (Generalised weakness)
- 8) Sharirbhar vridhi (Gross weight gain)

### B) Objective criteria: -

- a) Body Weight
- b) BMI > 25 (Body Mass Index) {Wt in Kg / Height in m<sup>2</sup>}
- c) Waist circumference
- d) Hip circumference
- e) Waist- Hip ratio
- f) Skin folds thickness at sites of Mid Triceps
- g) Measurement of Lipid Profile

**MEASUREMENT:** - The direct method of measuring body fat include Under water weighing (densitometry) and estimation of total body water or total body potassium or of fat cell mass by isotope dilution method. Computer tomography (CT scan) and nuclear magnetic resonance imaging (MRI) can be used to distinguish between fat and lean tissue.

The indirect methods are more commonly used in clinical and field practice and have advantage of less sophisticated equipments. They include,

**a) Height and Weight measurement:** - The most common method of recording relative weight is from the standard height and weight table. The standard height and weight table for the Indian male and female is adopted from LIC of India standard.

**b) Body mass Index (BMI):** - It is a measure of body fat relative to height. It is calculated as: -

$$\text{BMI} = \frac{\text{Weight in Kg}}{(\text{Height in meter})^2}$$

BMI's for the mid point of all heights and weights among both men and women range from 18.5 – 24.9 kg/m<sup>2</sup>. At a same BMI women have more body fat than men. Based on equivocal data of substantial morbidity, a BMI of 30 is most commonly set as threshold for obesity.

According to 1998 standards established by U.S. Public Health Services and W.H.O., B.M.I.classification is

Overweight	-	25-30
Class I	-	30-35
Class II	-	35-40
Class III	-	40-50
Class IV	-	>50

**c) Measurement of Skinfold thickness:** - The width of subcutaneous skinfold in the triceps is measured with calibrated calipers. It can also be measured at biceps, subscapularis and suprailliacus. Skinfolds have been used to measure fat distribution between trunk and extremities. This is termed as fat patterning index. The subscapularis to triceps skin fold ratio is associated with high rates of diabetes mellitus and ischemic heart disease.

**d) Measurement of Waist and Hip circumference with ratio:** - It is also an estimation of body fat distribution. Both in men and women high Waist-Hip ratio is considered risk factor for ischemic heart disease, stroke and death. This risk increases when the Waist-Hip ratio arises above.

In male > 1.0

In female > 0.8

Subjects with abdominal obesity (android obesity) are at greater risk for cardiovascular complications than those with gluteal obesity (gynoid obesity).

**Exclusion criteria:** –

- 1) Age below 16 yrs. and above 60 yrs.
- 2) BMI <25
- 3) Patients having medical emergencies associated with Hyperlipidemia like Coronary Heart disease, Atherosclerosis, Myocardial infarction etc.
- 4) Diabetes mellitus.
- 5) Hypothyroidism.
- 6) Pregnancy.
- 7) Drug induced.

**Investigation: -**

Lipid profile was performed before and after treatment in the patients selected for the study.

**Assesment of Progress:** – All the parameters were assessed before and after treatment. The assessment of progress was noted at 15<sup>th</sup>, 30<sup>th</sup>, 45<sup>th</sup>, 60<sup>th</sup> day after starting the treatment. Symptoms of the patient were noted at every follow up. Subjective and objective criteria were applied at every follow up to assess the effect of treatment. Suitable changes were made in the protocol, if necessary during the course of the study.

**Toxicity profile:** – An attention was given for the development of any adverse effect and intolerance to the drug during the course of the study,

**ASSESSMENT GRADE FOR SUBJECTIVE AND OBJECTIVE CRITERIA:**

**Subjective Criteria –**

**A. Pipasadhikya (Excess thirst) -**

- (0) - Absent
- (+) - Mild
- (++) - Moderate
- (+++)
- (++++)

**B. Kshudraswasa (Shortness of breath) –**

- (0) - Normal Breath.
- (+) - Short of breath on extra exertion.
- (++) - Short of breath on walking up mild inclines or stairs.
- (+++)
- (++++)

**C. Kshudhatimatra (Excess hunger) -**

- (0) - Absent
- (+) - Mild
- (++) - Moderate
- (+++)
- (++++)

**D. Swedadhikya (Excess perspiration) -**

- (0) - Absent
- (+) - After heavy exertion
- (++) - After Moderate exertion
- (+++)
- (++++)

**E. Atinidra (Excess sleep)**

- (0) - Absent
- (+) - Mild
- (++) - Moderate
- (+++)
- (++++)

**F. Sharirbhar vridhi**

- (0) - No change

- (+) - Mild reduced
- (++) - Moderatly reduced
- (+++)- Highly reduced
- (++++)- Markedly reduced

**Objective Criteria –**

**A. BMI: -**

Improvement	Reduction in BMI (in kg/m <sup>2</sup> )
I <sub>1</sub> (< 25 %)	- < 1
I <sub>2</sub> (25-50 %)	- 1-2
I <sub>3</sub> (50-75 %)	- 2-3
I <sub>4</sub> (>75 %)	- >3

**Criteria of assessment were as follows: -**

- a) Unsatisfactory - No or < 25 % improvement
- b) Mild improvement - 25-50 % improvement
- c) Moderate improvement - 50-75 % improvement
- d) Maximum improvement - >75 % or improvement

A composite score of above subjective parameter was done.

**Criteria of assessment of treatment result**

Symptoms before treatment +++++			
++++	No relief	-	0%
+++	Mild relief	-	25%
++	Moderate relief	-	50%
-	Maximum relief	-	>75

**OBSERVATIONS AND RESULTS:-**

**Statistical Analysis in between the Group A and Group B**

**Subjective Parameters (By Mann Whitney’s U Test)**

**Effect of therapy according to relief in Patients’ score**

Sr No	Group A				Sr No	Group B			
	B.T.	A.T.	Relieved	Relief %		B.T.	A.T.	Relieved	Relief %
1	27	8	19	70.37	1	27	5	22	81.48
2	26	7	19	73.07	2	26	1	25	96.15
3	28	8	20	71.42	3	27	3	24	88.88
4	24	10	14	58.33	4	24	4	20	83.33
5	29	9	20	68.96	5	29	5	24	82.75
6	19	0	19	100	6	20	0	20	100
7	21	8	13	61.90	7	22	7	15	68.18
8	27	11	16	59.25	8	27	1	26	96.29
9	19	9	10	52.63	9	27	7	20	74.07

10	24	5	19	79.16	10	24	4	20	83.33
11	19	4	15	78.94	11	22	0	22	100
12	19	0	19	100	12	21	0	21	100
13	26	3	23	88.46	13	26	2	24	92.30
14	19	10	9	47.36	14	22	5	17	77.27
15	29	5	24	82.75	15	29	4	25	86.20
16	23	7	16	69.56	16	23	2	21	91.30
17	25	5	20	80	17	25	0	25	100
18	19	3	16	84.21	18	21	1	20	95.23
19	22	8	14	63.63	19	22	5	17	77.27
20	19	7	12	63.15	20	26	5	21	80.76
21	24	0	24	100	21	24	0	24	100
22	22	3	19	86.36	22	23	3	20	86.95
23	20	0	20	100	23	21	0	21	100
24	24	4	20	83.33	24	24	1	23	95.83
25	19	7	12	63.15	25	26	3	23	88.46
26	21	9	12	57.14	26	23	2	21	91.30
27	26	11	15	57.69	27	29	7	22	75.86
28	21	1	20	95.23	28	21	1	20	95.23
29	17	3	14	82.35	29	20	2	18	90
30	24	6	18	75	30	24	0	24	100

The relieved symptom score and percent relief are given in the table 5.62. This relief is calculated according to BT and AT total score of patients in each patient of both groups.

**Effect of therapy according to relief in Symptoms' score in group A**

Sr. No.	Symptoms (Group A)	B.T.	A.T.	Relieved	% Relief
1	Kshudrashwasa	77	22	55	71.42
2	Kshudatimatra	94	21	73	77.66
3	Pipasadhikya	83	24	59	71.08
4	Swedadhikya	81	19	62	76.54
5	Atinidra	90	19	71	78.88
6	Daurgandhya	86	23	63	73.25
7	Daurbalya	77	22	55	71.42
8	Sharbhar vruddhi	94	21	73	77.66

Relieved score and %relief in Symptoms' score in Group B

Sr. No.	Symptoms (Group B)	B.T.	A.T.	Relieved	% Relief
---------	--------------------	------	------	----------	----------



1	Kshudrashwasa	85	11	74	87.05
2	Kshudatimatra	98	9	89	90.81
3	Pipasadhikya	86	10	76	88.37
4	Swedadhikya	91	9	82	90.11
5	Atinidra	92	12	80	86.95
6	Daugandhya	90	9	81	90
7	Daurbalya	85	11	74	87.05
8	Sharbhar vruddhi	98	9	89	90.81

The relieved symptom score and percent relief are mentioned in the table 7.48 and table 7.49. This relief is calculated according to BT and AT total symptom score of each symptom in both groups.

## DISCUSSION

In the present study Trial and Control groups comprising 30 patients each of Medovridhhi. (Obesity) were treated with Haridradi gana and Vachadi gana respectively. The Hypothesis for the study were-

### Null Hypothesis (H<sub>0</sub>)

Haridradi gana is not effective than Vachadi gana in Medovridhhi.

### Alternate Hypothesis (H<sub>1</sub>)

Haridradi gana is effective than Vachadi gana in Medovridhhi.

Collected data was tabulated, classified and present in the forms of tables and graphs and finally analyzed statistically in order to draw interference and to accept/reject hypothesis. Discussion and critical analysis is as follows.

### Statistical Analysis within Group A and Group B

#### Subjective Parameters (By Wilcoxon Signed Rank Test)

Statistical analysis within the Group A and B by Wilcoxon Signed Rank Test

Sr. No.	Symptoms	Gr.	W	P	Significance
1	Kshudra shwasa	A	435	P<0.0001	Significant
		B	465	P<0.0001	Significant
2	Kshud atimatra	A	465	P<0.0001	Significant
		B	465	P<0.0001	Significant
3	Pipasa adhikya	A	465	P<0.0001	Significant
		B	465	P<0.0001	Significant
4	Sweda adhikya	A	465	P<0.0001	Significant
		B	465	P<0.0001	Significant
5	Ati nidra	A	465	P<0.0001	Significant
		B	465	P<0.0001	Significant
6	Daur- gandhya	A	635	P<0.0001	Significant
		B	465	P<0.0001	Significant
7	Daurbalya	A	435	P<0.0001	Significant
		B	465	P<0.0001	Significant
8	Sharir bhar vruddhi	A	465	P<0.0001	Significant
		B	465	P<0.0001	Significant

Wilcoxon Ranked Sign test was applied to both groups separately to observe whether the difference between BT and AT score is significant or not.

### Group A

**H<sub>0</sub>:** Haridradi gana is not effective to reduce symptoms in Medovriddhi.

**H<sub>1</sub>:** Haridradi gana is effective to reduce symptoms in Medovriddhi.

In the case of all symptoms Kshudrashwasa, Kshudatimatra, Pipasadhikya, Swedadhikya, Atinidra, Daurgandhya, Daurbalya and Shrir bhar vruddhi the test has shown highly significant difference between BT and AT symptom scores. **H<sub>1</sub>** is accepted and **H<sub>0</sub>** is rejected here. It was hence concluded that Haridradi gana is effective to reduce Kshudrashwasa, Kshudatimatra, Pipasadhikya, Swedadhikya, Atinidra, Daurgandhya, Daurbalya and Shrir bhar vruddhi symptoms in Medovriddhi.

### Group B

**H<sub>0</sub>:** Vachadi gana is not effective to reduce symptoms in Medovriddhi.

**H<sub>1</sub>:** Vachadi gana is effective to reduce symptoms in Medovriddhi.

In the case of all symptoms Kshudrashwasa, Kshudatimatra, Pipasadhikya, Swedadhikya, Atinidra, Daurgandhya, Daurbalya and Shrir- bhar vruddhi the test has shown highly significant difference between BT and AT symptom scores. **H<sub>1</sub>** is accepted and **H<sub>0</sub>** is rejected here. It was hence concluded that Vachadi gana is effective to reduce Kshudrashwasa, Kshudatimatra, Pipasadhikya, Swedadhikya, Atinidra, Daurgandhya, Daurbalya and Shrirbhar vruddhi symptoms in Medovriddhi.

### Objective Parameters (By Student's t Test for Paired data)

Statistical analysis within the Group A and B by Paired t Test

Sr. No.	Parameters	Gr.	t	P	Significance
1	Weight	A	10.26	P<0.0001	Significant
		B	16.31	P<0.0001	Significant
2	BMI	A	8.700	P<0.0001	Significant
		B	9.989	P<0.0001	Significant
3	Skin fold	A	9.778	P<0.0001	Significant
		B	12.59	P<0.0001	Significant
4	Waist	A	17.66	P<0.0001	Significant
		B	2.043	P=0.0407	Significant
5	Hip	A	11.31	P<0.0001	Significant
		B	10.50	P<0.0001	Significant
6	Waist:Hip	A	2.248	P=0.039	Significant
		B	3.352	P=0.002	Significant
7	Triglyceride	A	10.96	P<0.0001	Significant
		B	20.03	P<0.0001	Significant
8	Cholesterol	A	13.29	P<0.0001	Significant
		B	15.78	P<0.0001	Significant

Paired t test was applied to both groups separately to observe whether the difference between BT and AT score is significant or not

### Group A

**H<sub>0</sub>:** Haridradi gana is not effective to decrease parameters in Medovriddhi.

**H<sub>1</sub>:** Haridradi gana is effective to decrease parameters in Medovriddhi.

In the case of all parameters Weight, BMI, Skin fold thickness, Waist, Hip, Waist hip ratio, Triglyceride and Cholesterol the test has shown highly significant difference between BT and AT symptom scores. **H<sub>1</sub>** is accepted and **H<sub>0</sub>** is rejected here. It was hence concluded that Haridradi gana is effective to decrease Weight, BMI, Skin fold thickness, Waist, Hip, Waist hip ratio, Triglyceride and Cholesterol parameters in Medovriddhi.

### Group B

**H<sub>0</sub>:** Vachadi gana is not effective to decrease parameters in Medovriddhi.

**H<sub>1</sub>:** Vachadi gana is effective to decrease parameters in Medovriddhi.

In the case of all parameters Weight, BMI, Skin fold thickness, Waist, Hip, Waist hip ratio, Triglyceride and Cholesterol the test has shown highly significant difference between BT and AT symptom scores. **H<sub>1</sub>** is accepted and **H<sub>0</sub>** is rejected here. It was hence concluded that Vachadi gana is effective to decrease Weight, BMI, Skin fold thickness, Waist, Hip, Waist hip ratio, Triglyceride and Cholesterol parameters in Medovriddhi.

### Statistical Analysis in between the Group A and Group B

#### Subjective Parameters (By Mann Whitney's U Test)

Both groups were compared and analyzed statistically by Mann Whitney's U test.

**H<sub>0</sub>:** Haridradi gana is not effective than Vachadi gana to reduce symptoms in Medovriddhi.

**H<sub>1</sub>:** Haridradi gana is effective than Vachadi gana to reduce symptoms in Medovriddhi.

**Table 8.5.1** Mann Whitney's U Test in between the Group A and Group B

Sr. No.	Symptom	U	P	Significance	Efficay
1	Kshudrashwasa	251	P=0.0031	Singnificant	B > A
2	Kshudatimatra	275	P=0.0087	Singnificant	B > A
3	Pipasadhikya	276	P=0.0097	Singnificant	B > A
4	Swedadhikya	231	P=0.0011	Singnificant	B > A
5	Atinidra	342	P=0.106	Not significant	A = B
6	Daugandhya	246	P=0.0024	Singnificant	B > A
7	Daurbalya	251	P=0.0031	Singnificant	B > A
8	sharirbhar vrudhhi	275	P=0.0087	Singnificant	B > A

In the case of symptom Atinidra test has shown insignificant difference between mean differences of Group A and Group B. **H<sub>0</sub>** is accepted and **H<sub>1</sub>** is rejected here. It was hence concluded that Haridradi gana is not effective than Vachadi gana to reduce Atinidra in Medovriddhi. It can be said that both are almost equally effective to reduce above said symptom. A little difference was found between the mean differences of both groups but this difference is not statistically significant because it is not greater than expected by chance.

In the case of symptoms Kshudrashwasa, Kashudatimatra, Pipasadhikya, Swedadhikya, Daurgandhya, Daurbalya and Sharir Bhar vrudhhi test has shown significant difference between mean differences of Group A and Group B. But still  $H_0$  is accepted and is  $H_1$  rejected here because the test shows significance for Control Group as mean difference of Control Group is more than that of Trial Group. It was hence concluded that Haridradi gana is not effective than Vachadi gana to reduce Kshudrashwasa, Kashudatimatra, Pipasadhikya, Swedadhikya, Daurgandhya, Daurbalya and Sharir Bhar vrudhhi in Medovridhhi. It means Vachadi gana is more effective than Haridradi gana to reduce above said symptoms.

**Objective Parameters (By Student’s t Test for Unpaired data)**

Both groups were compared and analyzed statistically by unpaired t test.

$H_0$ : Haridradi gana is not effective than Vachadi gana to decrease parameters in Medovridhhi.

$H_1$ : Haridradi gana is not effective than Vachadi gana to decrease parameters in Medovridhhi.

Table 8.4 Unpaired t Test in between the Group A and Group B

Sr. No.	Parameters	T	P	Significance	Efficay
1	Weight	2.258	P=0.035	Singnificant	B > A
2	BMI	2.064	P=0.045	Singnificant	B > A
3	Skin fold	2.042	P=0.049	Singnificant	B > A
4	Waist	2.040	P=0.05	Singnificant	B > A
5	Hip	2.053	P=0.046	Singnificant	B > A
6	Waist : Hip	0.884	P=0.380	Not significant	A = B
7	Triglyceride	6.792	P<0.0001	Singnificant	B > A
8	Cholesterol	8.863	P<0.0001	Singnificant	B > A

In the case of parameter Waist hip ratio test has shown insignificant difference between mean differences of Group A and Group B.  $H_0$  is accepted and is  $H_1$  rejected here. It was hence concluded that Haridradi gana is not effective than Vachadi gana to decrease Waist hip ratio in Medovridhhi. It can be said that both are almost equally effective to reduce above said symptom. A little difference was found between the mean differences of both groups but this difference is not statistically significant because it is not greater than expected by chance.

In the case of parameters Weight, BMI, Skin fold thickness, Waist, Hip, Triglyceride and Cholesterol test has shown significant difference between mean differences of Group A and Group B. But still  $H_0$  is accepted and is  $H_1$  rejected here because the test shows significance for Control Group as mean difference of Control Group is more than that of Trial Group. It was hence concluded that Haridradi gana is not effective than Vachadi gana to decrease Weight, BMI, Skin fold thickness, Waist, Hip, Triglyceride and Cholesterol in Medovridhhi. It means Vachadi gana is more effective than Haridradi gana to reduce above said parameters.

**Total Effect of the Therapy**

**According to Patients’ score**

Sr No	Improvement	Criteria	No of patients
-------	-------------	----------	----------------

	Grade		Group A	Group B
1	I <sub>4</sub>	75% - 100%	15	29
2	I <sub>3</sub>	50% - 74%	14	1
3	I <sub>2</sub>	25% - 49%	1	0
4	I <sub>1</sub>	00% - 24%	0	0

**In Group A** 15 patients have shown Grade IV improvement, 14 have shown Grade III improvement, 1 patient has shown Grade II improvement while none has shown Grade I improvement.

**In Group B**, 29 patients have shown Grade IV improvement, 1 has shown Grade III improvement while none has shown Grade II improvement and Grade I improvement.

It suggest that Group B has shown overall good effect than Group A to reduce patients' score.

#### According to Symptoms' score

Sr No	Improve-ment Grade	Criteria	Group A	Group B
			Symptoms	Symptoms
1	I <sub>4</sub>	75%-100%	Kshudatimatra, Swedadhikya, Atinidra, Bharvruddhi	Kshudatimatra, Swedadhikya, Atinidra, Bharvruddhi, Kshudrashwasa, Pipasadhikya, Daurgandhya, Daurbalya
2	I <sub>3</sub>	50% - 74%	Kshudrashwasa, Pipasadhikya, Daurgandhya, Daurbalya	---
3	I <sub>2</sub>	25% - 49%	---	---
4	I <sub>1</sub>	00% - 24%	---	---

**In Group A**, 4 symptoms have shown Grade IV improvement, 4 symptoms have shown Grade III improvement while none has shown Grade II improvement and Grade I improvement. **In Group B**, all 8 symptoms have shown Grade IV improvement while none has shown Grade III improvement, Grade II improvement and Grade I improvement.

It suggest that Group B has shown overall good effect than Group A to reduce patients' score.

#### Scope of study

1. Medovriddhi (Obesity) is increasing day by day. Hence such study has got mere importance.
2. Instead of taking for shorter duration if the same therapy should be given for atleast six months to one year for better results.
3. The management of Medovriddhi by Haridradi gana is found to be cost effective, easily avialiable and successful therapy.
4. There is no specific line of treatment for Medovriddhi (Obesity) in morden medicine.

5. The side effects of Modern drugs can be overcome surely by this Ayurvedic remedy.
6. Being panchabhautik chikitsa Haridradi gana helps to eradicate the disease completely.
7. Haridradi gana is also used for any age group patient i.e, sukumar, vyovridhha, mrudu koshta patients without any side effects.
8. There is further scope for new researchers to add Shodhan chikitsa and for long duration.

### Limitations of study

1. Present study was carried out in less sample size drawn from limited population. Larger representative sample drawn from large population would have yielded more fruitful results.
2. Study duration was only for sixty days. Longer duration study may open new dimensions regarding results.
3. Only oral therapy was studied without any shodhanopakram. Oral drugs against Medovridhhi (Obesity) along with panchakarma shodhanopakram such as snehan swedan, udvartan, basti chikitsa etc may be studied in future.

### CONCLUSION

After literary study, clinical trials, data collection, data classification, data presentation and data analysis in the dissertation work “A Clinical Study in the Management of Medovridhhi (Obesity) by Haridradi Gana.” here is time to conclude few interferences found from the study.

1. Medovridhhi can be correlated with Obesity or partially with hyperlipidemia.
2. Prevalence of Medovridhhi is increasing day by day due to sedentary life style and improper food habits.
3. Kaphaprakopak and Medovardhaka aahar-vihar, fast food, having Kapha dominant prakruti, packaged and ready food, long term sitting work, addictions, poor physical exertion, family history and stress are found most common hetus for Medovridhhi.
4. Medovridhhi found mostly prevalent in middle aged people (approximately 31 to 45) which is Madhya avastha of vaya. Females found more prone than males.
5. Servicemen and Businessmen are found more prone to Medovridhhi.
6. Samprapti ghatak observed were  
**Dosha** – Kapha pradhan  
**Dushya** – Mansa, Meda and Asthi (**Mala** – Sweda)  
**Strotasa** – Rasavaha, Annavaha, Mansavaha and Medovaha  
**Avastha** – Strotavrodhajanya.  
**Stroto dushti prakara** – Sang.  
**Vyadhi marga** – Shakha  
**Udbhavasthana** – Amashaya.  
**Adhithana** – Sarva sharira  
**Sadhyasadyatva** – Averagely Kashtasadya

Control group (Vachadi Gana) has shown overall better efficacy as compared to Trial group (Haridradi Gana) in Medovridhhi according to observations found and this efficacy found statistically significant. Hence final conclusion was Haridradi gana is less effective than Vachadi gana in Medovridhhi.

7. Haridradi Gana effectively reduced the all 8 symptoms and all 8 objective parameters in Medovridhhi. (p<0.0001)
8. Haridradi Gana effectively reduced the all 8 symptoms and all 8 objective parameters in Medovridhhi. (p<0.0001)

9. Vachadi gana found more efficient as compare to Haridradi gana to reduce all symptoms except Atinidra. (P<0.05) In case of Atinidra both drugs found almost equally effective. (P>0.05)
10. Vachadi gana found more efficient as compare to Haridradi gana to reduce all parameters except Waist/Hip ratio. (P<0.05) In case of Waist/Hip ratio both drugs found almost equally effective. (P>0.05)
11. Overall by Haridradi Gana 15 patients achieved excellent improvement and by Vachadi Gana 29 patients achieved excellent improvement. (Table 8.5)
12. While by Haridradi Gana 4 symptoms achieved excellent improvement and by Vachadi Gana all 8 symptoms achieved excellent improvement. (Table 8.6)
13. Haridradi Gana is effective, safe, easy to consume, easily available, cost effective to treat Medovridhi.
14. No complications or adverse drug effects were observed during the study with both of the drugs Haridradi gana and Vachadi gana.
15. Medovridhi can be treated effectively and safely by Ayurvedic drugs.

**Reference:-**

1. Shashtri A. Part –I, Sushrut Samhita of Sushruta Chaukhambha Prakashan Varanasi:, P No. 78,81,82.
2. Upadhyay Y. Part – II, Madhav Nidan, Chaukhambha Prakashan Varanasi:, Reprint 2010,34 P. 36
3. Shashtri A. Part – I, Sushrut Sutrostan Chaukhambha Sanskrit Sansthan Varanasi: Reprint 2013, 4/12-13 P.39
4. Tripathi B. P-I, Charak Sharirsthan, Chaukhambha Surbharti Varanasi: Reprint 2014, 7/15 P. 927
5. Upadyay Y. P-II, Madhav Nidana, Chaukhambha Prakashan Varanasi: Reprint 2010, 34/1 P. 36
6. Upadyay Y. P-II, Madhav Nidana, Chaukhambha Prakashan Varanasi: Reprint 2010 34/34 P. 36
7. Desai R. R, Ayurvediya Kriya Sharir, 8<sup>th</sup> Ed., Shri Baidnath Nagpur: 1999 P.646
8. Tripathi B. P – I Charak Samhita Chaukhambha Surbharti Varanasi Reprint 2014, 22/9 P. 412
9. Shashtri A. P-I, Sushrut Sutrasthan, Chaukhambha Sanskrit Sansthan Varanasi: Reprint 2013 15/7 P. 75
10. Shashtri A. P- I, Sushrut Sutrasthan, Chaukhambha Sanskrit Sansthan Varanasi:, Reprint 2013 15/13 P. 76
11. Gupta K. A. Ashtanga Hridaya, Chaukhambha Prakashan Varanasi: Reprint 2007 11/18 P.116
12. Tripathi B. P – I Charak Samhita, Chaukhambha Surbharti Varanasi: Reprint 2014, 8/106 P. 764
13. Tripathi B. P-I, Charak Samhita, Chaukhambha Surbharti Varanasi: Reprint 2014, 5/14 P. 697
14. Shashtri A. P- I Sushrut Sutrasthan, Chaukhambha Surbharti Varanasi:, Reprint 2013 9/11 P. 97
15. Shashtri A. P- I Sushrut Sutra Chaukhambha Surbharti Varanasi:, Reprint 2013 4/30 P. 42
16. Tripathi B. P-I Chaukhambha Surbharti Varanasi:, Reprint 2014, 7/10 P. 924
17. Tripathi B. P-I Charak Samhita Chaukhambha Surbharti Varanasi:, Reprint 2014 27/32 P. 390
18. Tripathi B. P-II Charak Samhita, Chaukhambha Surbharti Varanasi:, Reprint 2014 5/136 P. 269
19. Shashtri A. P-I, Sushrut Sutra Chaukhambha Surbharti Varanasi:, Reprint 2013 35/32 P. 173
20. Tripathi B. P-II, Charak Samhita Chaukhambha Surbharti Varanasi: Reprint 2014 15/15 P. 553
21. Tripathi B. P-II, Charak Samhita Chaukhambha Surbharti Varanasi:, Reprint 2014 15/13 P. 552
22. Tripathi B. P-I, Charak Samhita, Chaukhambha Surbharti Varanasi:, Reprint 2014 5/15 P. 699
23. Shashtri A. P-I, Sushrut Sutrasthan Chaukhambha Surbharti Varanasi:, Reprint 2013 15/37 P. 81
24. Upadhyay Y. Madhav Nidanam, Chaukhambha Prakashan Varanasi:, Reprint 2010 34/1 P. 34
25. Tripathi B. P-I, Charak Samhita Chaukhambha Surbharti Varanasi:, Reprint 2014 21 P. 300
26. Shashtri A. P-I, Sushrut Sutra, Chaukhambha Surbharti Varanasi:, Reprint 2013 15/37 P. 81
27. Misra B. S. 2<sup>nd</sup> Ed., Bhav Prakash, Chaukhambha Sanskrit Series Varanasi: P. 424

28. Sampurn Pandit, Shri. Misra, Bhav Prakash P. 424
29. Shashtri A. P-I, Sushrut Sutra, Chaukhambha Surbharti Varanasi:, Reprint 2013 21/36 P. 121
30. Shashtri A. P-I, Sushrut Sutra, Chaukhambha Surbharti Varanasi:, Reprint 2013 15/37 P. 81
31. Upadhyay Y. P- II Madhav Nidanam, Chaukhambha Prakashan Varanasi: Reprint 2010 34/8 P. 35
32. Tripathi B. P-I, Charak Samhita, Chaukhambha Surbharti Varanasi:, Reprint 2014 21/20 P. 404
33. Shashtri A. P-I, Sushrut Sutra Chaukhambha Surbharti Varanasi:, Reprint 2013 15/38 P. 82
34. Shashtri A. Bhaishajya Ratnavali, Choukhamba Sanskrit Sansthan Varanasi: 2005 P. No. 62.
35. Shetty M., 1<sup>st</sup> Ed. Yog Ratnakar, Choukhamba Sanskrit Series Varanasi: 2005 P. No. 97, 98.
36. Dan L. Longo Harrison's Principles of Internal Medicine N Shah 18<sup>th</sup> Edition 2008
37. Shaha S. N., 8<sup>th</sup> Ed, API Vol 1-2, The Association Principal of India 2012 P. No. 985
38. Jay Pee Brothers Medical Publishers Ltd. Textbook of pathology 6<sup>th</sup> Edition 2010.
39. Charchill Living Stone London Principles and Practice of Medicine Davidson 21<sup>th</sup> Edition P. 116.
40. Sharma P.V., Dravyaguna Vigyan, Choukhamba Bharti Varanasi:, 2006 P.162.
41. Vaidya Bapalal, Nighantu Adarsha, Choukhamba Bharti Varanasi: 2005, P No. 559, 49, 435, 847.
42. .Kirtikar K.R., 2<sup>nd</sup> Ed. Indian Medicinal Plants, International Distributer Dehradun: 2006 P No. 102, 569, 727, 749.
43. Sharma P. Dravyaguna Vigyan Choukhamba, Prakashan P. 537
44. Sharma P. Dravyaguna Vidyan P. 822
45. Deshpande A. P. Dravyaguna Vigyan, Proficient Publishing House Pune: 2016 P. No. 563, 519, 809, 852,977.
46. Sharma P.V. Dravyagun Vigyan, Choukhamba Bharti Varanasi: P. No. 253, 463
47. Chunekar K. Chaukhambha Bharti Varanasi, Bhawprakash Nighantu, Reprint 2013 1/197 P. 111, 113, 118,247
48. Satoskar R. S. Popular Prakashan Pvt. Ltd Mumbai Pharmacology & Pharmacoth erapeutics 21<sup>th</sup> Edition Reprint 2009P 2010 P. 575
49. Mahajan B. K. Jaypee Brothers Medical Publishers Pvt. Ltd. Methods in Biotatistics 7<sup>st</sup> Edition 2010.P.117.