

## A CLINICAL STUDY ON THE MANAGEMENT OF STHAULYA BY VACHADI CHURNA WITH SPECIAL REFERENCE TO OBESITY

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### ABSTRACT

Obesity or being overweight is a condition characterized by excessive storage of fat in the body. When the body's calorie intake exceeds the amount of calories burned, it leads to the storage of excess calories in the form of body fat. For treating *Sthaulya* lot of Herbal, Mineral, and Herbomineral medicines are described in ancient texts of Ayurveda. From which we have chosen the drug from *Ashtang Hridaya* i.e. *Vachadi Gana*<sup>1</sup> which contained *Vacha*, *Nagarmotha*, *Devdaru*, *Nagar*, *Ativisha* and *Haritki* and given the name as *Vachadi Churna*. **Aibjectives:** 1) to assess the clinical efficacy of *Vachadi Churna* in the patients of *Sthaulya*. 2) To compare the clinical efficacy of *Vachadi Churna* with that of *Dashang Guggul*. 3) To establish an effective, simple herbal combination in the management of *Sthaulya*. **Material and Methods:** In this study total 60 patients were randomly selected from the 20 to 50 years of age group with classical signs and symptoms of *sthaulya*. **Observation & Result:** Overall it was observed that Percentage of Relief in Each Patient of 60 Patients of *Sthaulya* in experimental group was 67.14 while 58.26 % in control group. On average in both group 62.70 % relief got in each patients of *sthaulya*. **Conclusion:** *Vachadi churna* has significant effect on *sthaulya*.

**Keywords:** Obesity, *vachadi churna*, *sthaulya*

### INTRODUCTION

In Ayurveda, obesity is known as *Medarog*, which is caused by the aggravation of *Kapha*. *Kapha* is an Ayurvedic humor which is dense, heavy, slow, sticky, wet and cold in nature. In a balanced state, *Kapha* gives nourishment to these tissues through various micro channels.<sup>13</sup> However, when it is aggravated, *Kapha* leads to production of toxins in

the body. These toxins are heavy and dense in nature and accumulate in weaker channels of the body, causing their blockage. In the case of an obese person, toxins accumulate in *Medovahi Srotas* (fat channels), thereby leading to an increase in the production of fat tissue (*Meda Dhatu*). When the

body produces more fat tissues, it causes an increase in weight.<sup>13</sup>

In Obesity, there is problem at the level of *Meda* (fat), nourishing *Asthi* (bone). This nutrition shift is hampered, because of which more and more of fat tissue gets produced, but it is not being converted further into *Asthi* (bone), *Majja* (bone marrow) and *Shukra* (reproductive system). There is blocking of transition of nutrition from *Meda* to *Asthi*.<sup>13</sup>

#### **Causes for obesity:**<sup>13</sup>

- Excess intake of food –
- Excess intake of heavy to digest, sweet foods, Coolant and oily foods

Lack of physical exercise, day sleeping

- Lack of mental stress, increased happiness:
- Heredity

For treating *Sthaulya* lot of Herbal, Mineral, and Herbomineral medicines are described in ancient texts of Ayurveda. Ample of studies were undertaken for treating *sthaulya vyadhi*. From which we have chosen the drug from *Ashtang Hriday* i.e. Vachadi Gana<sup>1</sup> which contained *Vacha*, *Nagarmotha*, *Devdaru*, *Nagar*, *Ativisha* and *Haritki* and given the name as *Vachadi Churna*.

Various studies were carried out on *Sthaulya* using single drugs as well as formulations, Ayurveda has potential remedy in the management of *Sthaulya*. Considering *Vachadi Churna* efficacy for treating *Sthaulya*. Hence *Vachadi Churna* was taken up for the present study.

#### **Aim:**

To evaluate the efficacy of *Vachadi Churna* in *Sthaulya* patients.

#### **Objectives:**

- To assess the clinical efficacy of *Vachadi Churna* in the patients of *Sthaulya*.
- To compare the clinical efficacy of *Vachadi Churna* with that of *Dashang Guggul*.
- To establish an effective, simple herbal combination in the management of *Sthaulya*.

#### **Material and Methods:**

##### **Source of Data:**

- Patients were selected from Ayurvedic Hospital.
- Ayurvedic Seminars magazines, Journals, Conferences, digital library & website.
- The raw drug was collected from the market under the supervision of Dravyaguna, Ras-shastra Specialist.

##### **Method of Collection of Data:**

- **Sample Source:** Total of 60 uncomplicated symptomatically diagnosed cases of *Sthaulya* studied during this research work. For this study the patients was taken from *kayachikitsa* O.P.D. of *Ayurvedic* Hospital.
- **Duration of Research Study:** 3 Months
- **Method of Selections:** Patients were selected symptomatically & on the basis of Weight and B.M.I.
- **Design of Study:** - An open randomized control clinical study has been conducted in patients suffering from *Sthaulya*
- **Drug Source:**-The required drugs were identified and collected from local market. it were prepared under the guidance of *Dravyagun* and Ras-shastra expert.
- **Group of Patients:** -
  - a. Group “A” were made as a Trial Group on *Vachadi Churna*. Group “B” were made as a Controlled Group on *Dashang Guggul*.

##### **Procedure:**

A Separate case proforma were prepared with history taking, physical signs, and symptoms, laboratory Investigations, B.M.I. and Weight of patient & other investigations which are necessary. Consent was taken from all patients with all instructions, benefits & hazards of treatment in the language understood by patients. The parameter of sign, symptoms & investigation were scored & assessed.

##### **Selection of Drug:-**

In various Samhitas, it is mentioned that various drugs having Medohar property. In *Ashtang Hriday*

has stated use of Vacha, Musta, Devdaru, Nagara, Ativisha & Haritki for Sthaulya.

**Table 1:** Showing properties of *Vachadi Churna*

| Drug            | Latin Name                    | Rasa                   | Virya  | Vipak  |
|-----------------|-------------------------------|------------------------|--------|--------|
| <i>Vacha</i>    | <i>Acorus calamus</i>         | Tikta, katu.           | Ushna  | Katu   |
| <i>Musta</i>    | <i>Cyperus rotundus</i>       | Tikta, katu            | Sheeta | Katu   |
| <i>Devdaru</i>  | <i>Cedrus deodara</i>         | Tikta                  | Ushna  | Katu   |
| <i>Nagara</i>   | <i>Zinziber officinalis.</i>  | katu,                  | Ushna  | Madhur |
| <i>Haritki</i>  | <i>Terminalia chebula</i>     | Pancharasa(lavanrhith) | Ushna  | Madhur |
| <i>Ativisha</i> | <i>Aconitum heterophyllum</i> | Tikta, katu            | Ushna  | Katu   |

**DASHANG GUGGUL** having following property.

**Table 2:** Showing properties of DashangGuggulu

|                              | Drug                          | Latin Name                  | Rasa                   | Virya        | Vipaka |
|------------------------------|-------------------------------|-----------------------------|------------------------|--------------|--------|
| <i>Triphala</i> <sup>7</sup> | <i>Aamalaki</i> <sup>8</sup>  | <i>Emblica officinalis</i>  | Pancharas(Lavanrahith) | Shita        | Madhur |
|                              | <i>Haritaki</i> <sup>9</sup>  | <i>Terminalia chebula</i>   | Pancharas(Lavanrahith) | Ushna        | Madhur |
|                              | <i>Bibhitak</i> <sup>10</sup> | <i>Terminalia belerica</i>  | Kashaya                | Ushna        | Madhur |
| <i>Trikatu</i> <sup>11</sup> | <i>Shunthi</i> <sup>12</sup>  | <i>Zinziber officinalis</i> | Katu                   | Ushna        | Madhur |
|                              | <i>Maricha</i> <sup>13</sup>  | <i>Piper nigrum</i>         | Katu                   | Ushna        | Katu   |
|                              | <i>Pimpali</i> <sup>14</sup>  | <i>Piper longum</i>         | Katu                   | Anushna Shit | Katu   |
| <i>Trimad</i>                | <i>Vidang</i> <sup>15</sup>   | <i>Emblica ribes</i>        | Katu, Kashaya          | Ushna        | Katu   |
|                              | <i>Musta</i> <sup>16</sup>    | <i>Cyperus rotundus</i>     | Tikta, Katu, Kashaya   | Shita        | Katu   |
|                              | <i>Chitrak</i> <sup>17</sup>  | <i>Plumbago zeylanica</i>   | Katu                   | Ushna        | Katu   |
|                              | <i>Guggulu</i> <sup>18</sup>  | <i>Commiphora mukula</i>    | Tikta, Katu            | Ushna        | Katu   |

**DRUG MANUFACTURING:** Crude Drugs were identified and collected from the local market of

Nagpur and it were prepared under the guidance of Dravyaguna & Ras-shastra experts.

**DRUG COMPONENTS:-**

|                        |                   |
|------------------------|-------------------|
| <i>Vacha Churna</i>    | } In Equal Amount |
| <i>Musta Churna</i>    |                   |
| <i>Devdaru Churna</i>  |                   |
| <i>Nagar Churna</i>    |                   |
| <i>Haritki Churna</i>  |                   |
| <i>Ativisha Churna</i> |                   |

**Selection criteria:-**

**Inclusion criteria:**

- Patient fulfilling the diagnostic criteria, signs and symptoms of Sthaulya.
- Aged between 20 to 50 Yrs. of either sex.
- Patients having B.M.I. between 25 to 30.

**Exclusion Criteria:**

- Patients not willing for trial.
- Patients having complications such as uncontrolled diabetes, cardiovascular diseases etc.

- Patients having poorly Controlled blood pressure >160/100 mmHg.
- Patients having other complications like Malignancies or having hepatic or renal problems.
- Patients are on prolonged medication like cortico steroids or any other drugs that may have an influence on the outcome of the study.
- Patients who are currently participating in any other trial.(since last 6 months)
- Pregnant and lactating mothers.

- Any other conditions which the researcher thinks may jeopardize the study.

**Withdrawal Criteria:**

If any Complication arises during treatment the cases were liable for rejection.

**Investigation:**

1. Routine blood and urine investigation were done.
2. Blood Sugar (Fasting and Post prandial) .
3. Lipid Profile was done wherever necessary.

**Observation Period:-**

| Day                   | Follow Up       |
|-----------------------|-----------------|
| 0 day                 | -               |
| 15 <sup>th</sup> days | 1 <sup>ST</sup> |
| 30 <sup>th</sup> days | 2 <sup>ND</sup> |
| 45 <sup>th</sup> days | 3 <sup>RD</sup> |
| 60 <sup>th</sup> days | 4 <sup>TH</sup> |
| 75 <sup>th</sup> days | 5 <sup>TH</sup> |
| 90 <sup>th</sup> days | 6 <sup>TH</sup> |

**Table 3: Management of Groups:-**

|               | <b>Trial Group</b>     | <b>Controlled Group</b>   |
|---------------|------------------------|---------------------------|
| Drug          | <i>Vachadi Churna</i>  | <i>Dashang Guggulu</i>    |
| Dose          | 5gm orally twice daily | 500 mg orally twice daily |
| <i>Anupan</i> | <i>Koshan Jal</i>      | <i>Koshana Jal</i>        |
| Duration      | 3 months               | 3 months                  |

**Assessment criteria:-**

The proforma was prepared with all the points of history taking. It also included the examination based on criteria mentioned in Ayurvedic classics. Assessment of the effect of treatment was done on the basis of relief in the clinical Symptoms of the disease. Scoring pattern was adapted to assess the relief in the Symptoms.

**Subjective parameters:-**

- Symptoms of *Sthaulya Vyadhi* mentioned in the text or practically observed were assessed at each follow- up and presence or absence of them was registered.
- All symptoms were graded into grade scale from 0 onwards up to 5 on the basis of severity to assess the changes and this study in gradation were done at each follow up.

### Gradation of symptoms:

Following scoring pattern were adopted for the assessment of sign and symptoms.

#### 1. *Angachalatva:*

|   |   |
|---|---|
| - Absence of Chalatra                             | 0 |
| - Little visible movement after fast movement     | 1 |
| - Little visible movement after moderate movement | 2 |
| - Movement after mild movement                    | 3 |
| - Movement even after changing posture            | 4 |

#### 2. *Atikshudha*

*Atikshudha* was decided on the basis of *Abhyavaharana Shakti* and *Jarana Shakti*.

##### a. *Abhyavaharana Shakti*

|  |   |
|--|---|
| - Person not at all taking food                            | 0 |
| - Person taking food in less quantity once a day           | 1 |
| - Person taking food in less quantity twice in a day       | 2 |
| - Person taking food in moderate quantity twice in a day   | 3 |
| - Person taking food in normal quantity twice in a day     | 4 |
| - Person taking food in excessive quantity twice or thrice | 5 |

##### b. *Jarana Shakti*

|  |   |
|--|---|
| - According to presents of Jirna Ahara Lakshana (MN. 6/24) Utsaha, Laghuta, UdgatSuddhi, Kshudha-Trisha Pravritti, Yathochita, Malotsarga. |   |
| - Presence of one symptom after 6 hours  | 0 |
| - Presence of two symptoms after 6 hours   | 1 |
| - Presence of three symptoms after 5 hours   | 2 |
| - Presence of four symptoms after 5 hours  | 3 |
| - Presence of all symptoms after 4 hours   | 4 |
| - Presence of all symptoms within 4 hours  | 5 |

#### 3. *Kshudraswasa:*

|  |   |
|--|---|
| - Dyspnoea after heavy work but relieved soon and upto tolerance     | 0 |
| - Dyspnoea after moderate work but relieved later and upto tolerance | 1 |
| - Dyspnoea after little work but relieved later and upto tolerance   | 2 |
| - Dyspnoea after little work but relieved later and beyond tolerance | 3 |
| - Dyspnoea in resting condition                                      | 4 |

#### 4. *Gatrasada:*

|   |   |
|---|---|
| - No fatigue                                  | 0 |
| - Little fatigue in doing hard work           | 1 |
| - Moderate fatigue in doing routine work      | 2 |
| - Excessive fatigue in doing routine work     | 3 |
| - Excessive fatigue even in doing little work | 4 |

#### 5. *Daurgandhya:*

|   |   |
|---|---|
| - Absence of bad smell  | 0 |
| - Occasional bad smell in the body removed after bathing                            | 1 |
| - Persistent bad smell limited to close areas difficult to suppress with deodorants | 2 |

|  |   |
|--|---|
| - Persistent bad smell felt from long distance is not suppressed by deodorants         | 3 |
| - Persistent bad smell felt from long distance even intolerable to the patient himself | 4 |
| <b>6. Swedadhikya:</b> (at normal temperature in normal condition) :                   |   |
| - Sweating after heavy work and fast movement or in hot season                         | 0 |
| - Profuse sweating after moderate work and movement                                    | 1 |
| - Sweating after little work and movement  | 2 |
| - Profuse sweating after little work and movement                                      | 3 |
| - Sweating even at rest or in cold season  | 4 |
| <b>7. Atipipasa:</b>   |   |
| - Normal thirst  | 0 |
| - Upto 1 litre excess intake of water  | 1 |
| - 1 to 2 litre excess intake of water  | 2 |
| - 2 to 3 litre excess intake of water  | 3 |
| - More than 3 litre of water   | 4 |
| <b>8. Snigdhangata:</b>  |   |
| - Normal snigdghata  | 0 |
| - Oily luster of body in summer season   | 1 |
| - Oily luster of body in dry season  | 2 |
| - Excessive oily luster of body in dry season which can be removed with difficulty     | 3 |
| - Persistence and profuse stickiness all over body                                     | 4 |
| <b>9. Daurbalya:</b>   |   |
| - Can do routine exercise  | 0 |
| - Can do moderate exercise without difficulty  | 1 |
| - Can do only mild exercise  | 2 |
| - Can do mild exercise with very difficult   | 3 |
| - Cannot do even mild exercise   | 4 |
| <b>10. Alasya:</b>   |   |
| - No alasya (doing work satisfactory with proper vigour in time)                       | 0 |
| - Doing work satisfactory with initiation late in time                                 | 1 |
| - Doing work unsatisfactory with lot of mental pressure and late in time               | 2 |
| - No starting any work in his own responsibility doing little work very slowly         | 3 |
| - Does not have any initiation and not wants to work even after pressure               | 4 |
| <b>11. Nidradhikya:</b>  |   |
| - Normal sleep 6-7 hrs. per day  | 0 |
| - Sleep upto 8 hrs./day with Angagaurava   | 1 |
| - Sleep upto 8 hrs./day with Angagaurava and Jrimbha                                   | 2 |
| - Sleep upto 10 hrs./day with Tandra   | 3 |
| - Sleep more than 10 hrs./day with Tandra and Klama                                    | 4 |

**Objective criteria:-**

1. Standard height–weight chart were included.
2. The value of BMI were used.(25 to 30)

3. Waist and Hip circumference

4. Waist and Hip ratio

**Assessment Criteria:**

- <25 % Relief – Unchanged.
- 25 - 50 % Relief – Minor improvement.
- 50 – 75 % Relief – Moderate Improvement.
- >75 % Relief – Marked improvement.
- 100% Relief - Complete remission

#### OBSERVATION & RESULTS:

In this study, 60 patients of *Sthaulya* were studied and selected randomly as per criteria of selection irrespective of religion, socio-economic status. All these patients were diagnosed with the help of criteria of diagnosis. Specially designed Case Report Form (CRF) was used to fill the all information of subjects. Patients attending *Kayachikitsa* O.P.D of the hospital were examined prior to the start of treatment with respect to the Proforma these values were termed as before treatment values. (B.T)

After complete examination treatment was started while patients were assigned randomly in groups. Experimental group was treated with *Vachadi Churna* along with *koshna jala* & it is considered as group-A. While in control group *Dashang Guggul* along with *Koshna jala* allocated and considered as group-B. After completion of therapy all values of these investigations and examinations were recorded, it was termed as after treatment (AT).

All these observations were statistically analyzed and results obtained are presented as follows:

1. Total number of patients recruited in the study - 65
2. Number of patients who completed study - 60
3. Number of patients in Exp. Group - 30
4. Number of patients in Control group - 30

Number of patients enrolled in the study in the beginning and number of patients dropped out are tabulated accordingly:

**Table 4:** Distribution of Patient in Each Group:

| Group                                     | Trial Group | Control Group | Total |
|---|-------------|---------------|-------|
| Number of patients in the beginning       | 32          | 33            | 65    |
| Patients dropped out                      | 2           | 3             | 5     |
| Patients remain till the end of the trial | 30          | 30            | 60    |

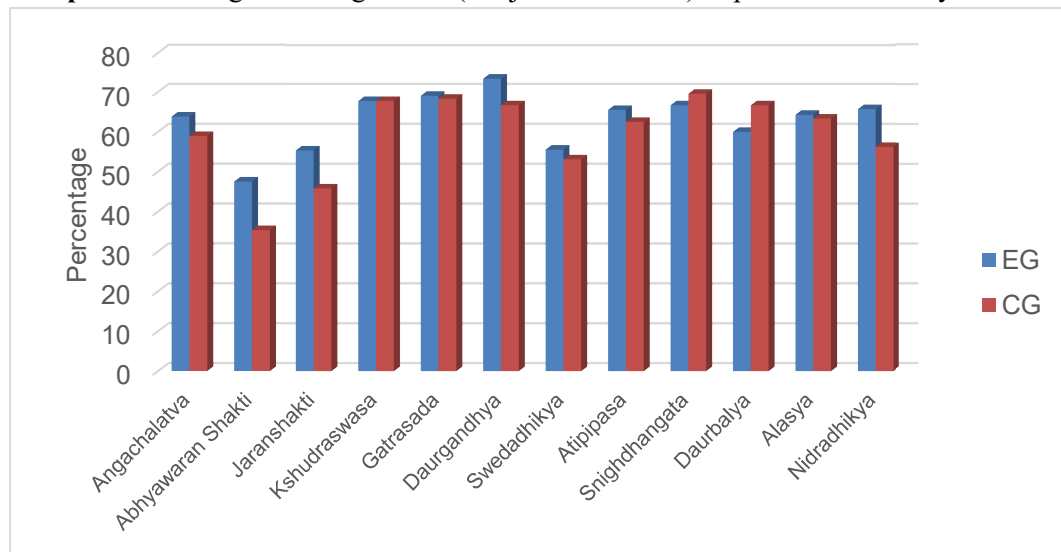
#### CLINICAL OBSERVATIONS:

**Table 5:** Showing Percentage of Relief (Subjective Criteria) in Each Symptom of 60 Patients of *Sthaulya*

| Sr. No. | Symptoms                       | Experimental Group |    |      |              | Control Group |    |      |              |
|---------|--------------------------------|--------------------|----|------|--------------|---------------|----|------|--------------|
|         |                                | BT                 | AT | Diff | % of Relief  | BT            | AT | Diff | % of Relief  |
| A       | <b>Subjective Criteria</b>     |                    |    |      |              |               |    |      |              |
| 1       | <i>Angachalatva</i>            | 47                 | 17 | 30   | <b>63.82</b> | 39            | 16 | 23   | <b>58.97</b> |
| 2       | <i>Atikshudha</i>              |                    |    |      |              |               |    |      |              |
|         | a) <i>Abhyavaharana Shakti</i> | 61                 | 32 | 29   | <b>47.54</b> | 82            | 53 | 29   | <b>35.36</b> |
|         | b) <i>Jarana Shakti</i>        | 56                 | 25 | 31   | <b>55.35</b> | 48            | 26 | 22   | <b>45.83</b> |
| 3       | <i>Kshudraswasa</i>            | 31                 | 10 | 21   | <b>67.74</b> | 31            | 10 | 21   | <b>67.74</b> |
| 4       | <i>Gatrasada</i>               | 42                 | 13 | 29   | <b>69.04</b> | 41            | 13 | 28   | <b>68.29</b> |
| 5       | <i>Daurgandhya</i>             | 30                 | 8  | 22   | <b>73.33</b> | 27            | 9  | 18   | <b>66.67</b> |
| 6       | <i>Swedadhikya</i>             | 27                 | 12 | 15   | <b>55.55</b> | 32            | 15 | 17   | <b>53.12</b> |
| 7       | <i>Atipipasa</i>               | 29                 | 10 | 19   | <b>65.51</b> | 32            | 12 | 20   | <b>62.5</b>  |
| 8       | <i>Snighdhangata</i>           | 18                 | 6  | 12   | <b>66.67</b> | 23            | 7  | 16   | <b>69.56</b> |
| 9       | <i>Daurbalya</i>               | 30                 | 12 | 18   | <b>60.00</b> | 33            | 11 | 22   | <b>66.67</b> |
| 10      | <i>Alasya</i>                  | 28                 | 10 | 18   | <b>64.28</b> | 30            | 11 | 19   | <b>63.33</b> |
| 11      | <i>Nidradhikya</i>             | 35                 | 12 | 23   | <b>65.71</b> | 32            | 14 | 18   | <b>56.25</b> |



**Graph 1: Showing Percentage relief (Subjective Criteria) in patients of Sthaulya**



**Table 6: Showing Percentage of Relief (Objective Criteria) in Each Parameter of 60 Patients of Sthaulya:**

| Sr. No. | Parameters              | Experimental Group |         |           |             | Control Group |         |           |             |
|---------|-------------------------|--------------------|---------|-----------|-------------|---------------|---------|-----------|-------------|
|         |                         | BT Mean            | AT Mean | Diff Mean | % of Relief | BT Mean       | AT Mean | Diff Mean | % of Relief |
| 1       | Weight(kg)              | 73.5               | 66.3    | 7.2       | 9.80        | 74.1          | 70.5    | 3.56      | 4.81        |
| 2       | BMI(kg/m <sup>2</sup> ) | 27.17              | 24.51   | 2.65      | 9.77        | 27.72         | 26.32   | 1.34      | 4.83        |
| 3       | Waist circumference(cm) | 100.2              | 98.8    | 1.36      | 1.36        | 98.4          | 97.6    | 0.8       | 0.81        |
| 4       | Hip circumference       | 108.7              | 107.8   | 0.90      | 0.82        | 107.9         | 107.2   | 0.63      | 0.58        |
| 5       | Waist /Hip ratio        | 0.92               | 0.91    | 0.004     | 0.51        | 0.91          | 0.91    | 0.00      | 0.00        |

**Table 7: Comparison between Two Group w.r.t Symptoms Score of 60 Patients in Sthaulya**

| No | Symptoms           | Mean ± SD |           | Sum of Rank |       | Test static |       | p Value |
|----|--------------------|-----------|-----------|-------------|-------|-------------|-------|---------|
|    |                    | Gr-A      | Gr-B      | Gr-A        | Gr-B  | U'          | U     |         |
| 1  | Angachalatva       | 1.0±0.74  | 0.76±0.93 | 978         | 852   | 513         | 387   | 0.3532  |
| 2  | Atikshudha         |           |           |             |       |             |       |         |
|    | a)Abhyvaran shakti | 0.96±0.96 | 0.96±0.96 | 903         | 927   | 462         | 438   | 0.8639  |
|    | b)Jaran shakti     | 1.03±0.80 | 0.73±0.63 | 1008.5      | 821.5 | 543.5       | 356.5 | 0.1646  |
| 3  | Kshudraswasa       | 0.70±0.65 | 0.70±0.70 | 907.5       | 922.5 | 457.5       | 442.5 | 0.9165  |
| 4  | Gatrasada          | 0.96±0.92 | 0.93±0.69 | 914         | 916   | 451         | 449   | 0.9941  |
| 5  | Daurgandhya        | 0.70±0.59 | 0.60±0.56 | 952.5       | 877.5 | 487.5       | 412.5 | 0.5781  |
| 6  | Swedadhikya        | 0.46±0.58 | 0.56±0.67 | 850.5       | 979.5 | 514.5       | 385.5 | 0.3386  |
| 7  | Atipipasa          | 0.63±0.80 | 0.66±0.71 | 891         | 939   | 474         | 426   | 0.7250  |
| 8  | Snighdhangata      | 0.40±0.49 | 0.53±0.77 | 870         | 960   | 495         | 405   | 0.5051  |
| 9  | Daurbalya          | 0.60±0.72 | 0.73±0.78 | 885.5       | 944.5 | 479.5       | 420.5 | 0.6644  |
| 10 | Alasya             | 0.60±0.62 | 0.63±0.71 | 900         | 930   | 465         | 435   | 0.8281  |
| 11 | Nidradhikya        | 0.76±0.67 | 0.60±0.77 | 961.5       | 868.5 | 496.5       | 403.5 | 0.4914  |



**Table 8:** Effect of Therapy on Objective parameters of *Sthaulya* in Experimental Group (Test Applied was Paired T –Test)

| Sr. No | Parameters              | Mean ± SD  |            | ±S Ed |       | t value | P Value |
|--------|-------------------------|------------|------------|-------|-------|---------|---------|
|        |                         | BT         | AT         | BT    | AT    |         |         |
| 1.     | Weight(kg)              | 73.5±6.97  | 66.3±8.01  | 1.27  | 1.46  | 8.722   | <0.001  |
| 2.     | BMI(kg/m <sup>2</sup> ) | 27.17±1.93 | 24.51±2.50 | 0.35  | 0.45  | 9.111   | <0.001  |
| 3.     | Waist Circumference     | 100.2±9.52 | 98.86±9.16 | 1.73  | 1.67  | 5.163   | <0.001  |
| 4.     | Hip circumference       | 108.76±8.6 | 107.8±8.7  | 1.57  | 1.60  | 4.791   | <0.001  |
| 5.     | Waist /Hip ratio        | 0.92±0.03  | 0.91±0.03  | 0.006 | 0.005 | 2.015   | <0.05   |

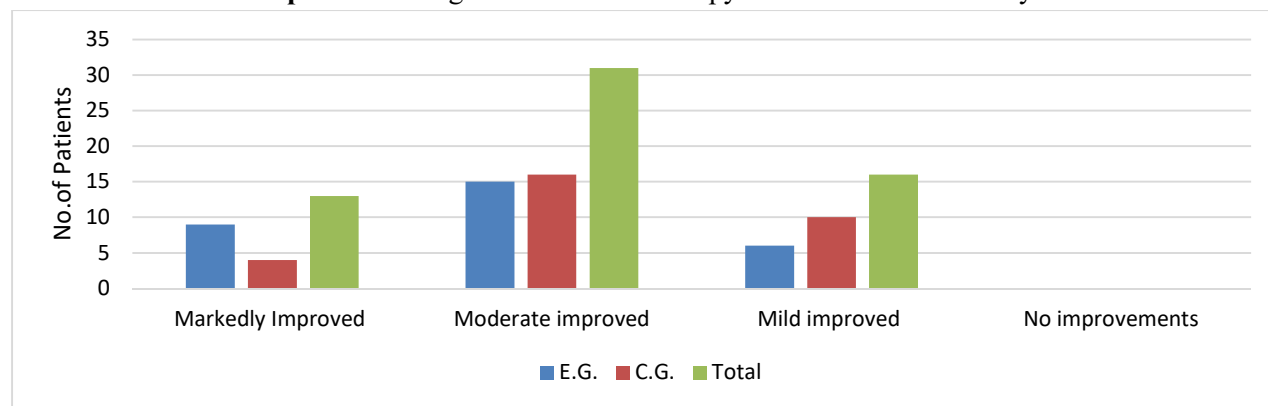
**Table 9:** Showing Effect of Comparison Between Group w.r.t. Objective parameters of 60 Patients in *Sthaulya* (Test Applied was Unpaired T –Test)

| Sr.No | Parameters              | Mean ± SD  |            | ±S Ed |       | t Value | p Value |
|-------|-------------------------|------------|------------|-------|-------|---------|---------|
|       |                         | Gr.A       | Gr.B       | Gr.A  | Gr.B  |         |         |
| 1.    | Weight(kg)              | 7.20±4.52  | 3.56±3.24  | 0.82  | 0.59  | 3.576   | <0.001  |
| 2.    | BMI(kg/m <sup>2</sup> ) | 2.65±1.59  | 1.33±1.20  | 0.29  | 0.22  | 3.602   | <0.001  |
| 3.    | Waist Circumference     | 1.36±1.45  | 0.80±2.05  | 0.26  | 0.37  | 1.233   | >0.05   |
| 4.    | Hip circumference       | 0.90±1.02  | 0.63±2.04  | 0.18  | 0.37  | 0.6387  | > 0.05  |
| 5.    | Waist /Hip ratio        | 0.004±0.01 | 0.003±0.02 | 0.002 | 0.004 | 0.3264  | >0.05   |

**Table 10:** Showing Total Effect of therapy in 60 Patients of *Sthaulya*

| Sr. No | Effect Of Therapy          | No. Of Patients |      |       | Percentage % |       |       |
|--------|----------------------------|-----------------|------|-------|--------------|-------|-------|
|        |                            | E.G.            | C.G. | Total | E.G.         | C.G.  | Total |
| 1.     | Markedly Improved >75%     | 09              | 04   | 13    | 30.0         | 13.33 | 21.67 |
| 2.     | Moderate improved (50-75%) | 15              | 16   | 31    | 50.0         | 53.33 | 51.67 |
| 3.     | Mild improved 25-50 %      | 06              | 10   | 16    | 20.0         | 33.33 | 26.67 |
| 4.     | No improvements <25%       | 00              | 00   | 00    | 00           | 00    | 00    |

**Graph 2:** Showing Total Effect of therapy in 60 Patients of *Sthaulya*:



In Experimental Group, 09 [30%] patients were markedly improved, 15 [50 %] were moderately, 06 [20 %] patients were mild improved, while no patients in left the study.

In Control Group, no patients were improved markedly, 04 [13.33%] patient was moderately improved, 16[53.33%] patients were mild improved

and 10 [33.33 %] patients were not able to improve the conditions.

Totally, 13[21.67%] patients were markedly improved, 31[51.67%] patients moderately, 16 [26.66%] were mild improved.

## DISCUSSION

For the analysis of subjective criteria in control group the Wilcoxon Signed Rank Test was applied for the difference between before treatment and after treatment score of both group compared by 'Mann-Whitney U Test'.

Overall, it was observed that Percentage of Relief in Each Patient of 60 Patients of *Sthaulya* in experimental group was 67.14 while 58.26 % in control group. On average in both group 62.70 % relief got in each patients of *sthaulya*

In Experimental Group, 09 [30%] patients were markedly improved, 15 [50 %] were moderately, 06 [20 %] patients were mild improved, while no patients left in the study.

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## CONCLUSION

Totally, 13 [21.67%] patients were markedly improved, 31 [51.67%] patients moderately, 16 [26.66%] were mild improved.

Overall it was observed that Percentage of Relief in Each Patient of 60 patients of *Sthaulya* in experimental group was 67.14 while 58.26 % in control group. On average in both group 62.70 % relief got in each patients of *Sthaulya*. The difference between means of two sets of observation that is before and after treatment is the same, so the Null Hypothesis is accepted.

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