IJIRR

International Journal of Information Research and Review
Vol. 05, Issue, 05, pp.5489-5492, May, 2018

# REVIEW ARTICLE

## A STUDY ON THE EFFICACY OF *MAHAPASMUL* DECOCTION ON OBESITY AND TYPE II DIABETES

**[1,] *Perera, M.S.S and [2]Samarakoon, S.M.S**

[1]Department of Prasuti tantra and StreeRoga, IPGT & RA, Gujart Ayurved University, Jamnagar, India
[2]Department of *Deshiyachikitsa*, Institute of Indigenous Medicine, University of Colombo, Sri Lanka

**ARTICLE INFO**

***Article History:***

Received 19th February, 2018
Received in revised form
20th March, 2018
Accepted 26th April, 2018
Published online 30th May, 2018

***Keywords:***

*Mhapasmul* Decoction,
Obesity,
Type-II Diabetes,
Lipid profile,
Fasting Blood Sugar.

**ABSTRACT**

The present study is a clinical study to evaluate the efficacy of *Mahapasmul* Decoction (MD) on Obesity and type II diabetes. Diagnosed patients were selected from Ayurveda Teaching Hospital at Borella from the period of January 2015 to May 2016. Thirty patients (30) who had BMI between 25 to 45 and fasting blood glucose <200 mg/dl were included in the study. Subjective assessment criteria were the sympoms of obesity with proper grading whereas objective criteria were BMI, body circumferences, skin-fold thickness, Lipid profile and FBS. Data were analyzed by using SPSS statistical software. In this study, *Mahapasmul* Decoction was given for eight weeks, 120 ml twice a day, before meal with 5ml Bee honey. *Mahapasmul* Decoction improved most of the signs and symptoms of obesity,most of the body circumferences, BMI (from 35.30 ±0.85 to 32.53±0.92), Skin Fold Thickness, Triglyceride (from122.73 ± 1.68 to126.45 ±1.10), and Fasting Blood Sugar (from 95.68 ±1.67 to 91.91 ± 1.54 ) in statistically highly significant manner ($p<0.001$) whereas the improvement of excessive thirst, excessive sweating, and drowsiness is statistically significant.($p< 0.05$). Considering lipid profile, MD improved Triglyceride, Fasting blood sugar in statistically highly significant manner ($P<0.001$), whereas the reduction of LDL is statistically significant ($p<0.05$). Collectively, MD is composed of *Katu*(20%), *Tikta*(100%) and *Kashaya rasa* (100%); *Laghu* (100%), *Ruksha* (66.6%) and *Guru guna* (16.6%); *Ushanavirya* (66.6%); and *Katuvipaka* (100%). The pharmaco-dynamic properties of MD reduce *kapha-meda* and increase *agni*. Hence, MD is efficacious on promoting digestive power and correcting *sroto-avarodha*. Finally, it may be concluded that *Mhapasmul* Decoction is effective on most of the subjective and objective parameters of Obesity and type II Diabetes.



## INTRODUCTION

Sthaulya is included under Ashtauninditapurusha[1] *and diseases of* Shleshmananatmaja[2], Samtarpananimittaja[3], Ati-Brihmana nimittaja,[4]and Bahudoshajanita *vikara*[5]. Accumulation of fat over the limit led to ill effect in the body known as obesity. Body mass index (BMI) is an index of weight-for-height that is commonly used to classify overweight and obesity.

***Corresponding author:*** **Perera, M.S.S**
Department of Prasuti tantra and StreeRoga, IPGT & RA, Gujart Ayurved University, Jamnagar, India

[1]Charaka Samhita of Agnivesha (2007); Translated by Sharma P.V, Chaukambha Orientalia, Varanasi (Ch. Su.21).
[2]Charaka Samhita of Agnivesha (2007); Translated by Sharma P.V, Chaukambha Orientalia, Varanasi Ch.Su. 20).
[3]Charaka Samhita of Agnivesha (2007); Translated by Sharma P.V, Chaukambha Orientalia, Varanasi (Ch.Su. 23).
[4]Charaka Samhita of Agnivesha (2007); Translated by Sharma P.V, Chaukambha Orientalia, Varanasi (Ch.Su.22).
[5]Charaka Samhita of Agnivesha (2007); Translated by Sharma P.V, Chaukambha Orientalia, Varanasi (Ch.Su.16).

The World Health Organization (WHO) definition is [6]a BMI greater than 25 is overweight and[7] BMI greater than 30 is obesity. Obesity and overweight occurs due to imbalance between calories consumed and calories utilized. Globally, there have been two reasons for overweight and obesity:[7] an increased intake of energy-dense foods that are high in fat, salt and sugars; and[8] a decrease in physical activity due to the increasingly sedentary nature of many forms of workand increasing urbanization. Overweight and obesity are the fifth leading risk for global deaths. At least, 2.8 million adults die each year as a result of being overweight or obese. In addition, 44% of the diabetes burden, 23% of the ischemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity. Overall, more than one

[6]World Health Organization, "Obesity. Preventing and managing the Global Epidemic, Report of a WHO consultation (WHO Technical Report Series 894), WHO, 2000. http://www.who.int/nutrition/publications/obesity/WHO_TRS_ 894/en/
[7]Worldwide Obesity Trends—Globosity," http://www.annecollins.com/obesity/ causes-of-obesity.htm.

in ten of the world's adult population is obese. [8] In addition to increased future risks, obese persons experience breathing difficulties, increased risk of fractures, hypertension, cardiovascular diseases and psychological effects.[9] *Apathyanimittajaprameha* is caused by unhealthy dietary and lifestyle factors and it is well correlated with type II Diabetes Mellitus. Ayurveda possesses a number of valuable remedies that can be used in the management of *apathyanimittajaprameha*.

**Justification**

Obesity is one of the burning problems globally as it hamper the different systems in the body. An obese person is prone to land up in complications like dyslipidemia, hypertension, coronary heart diseases, diabetes mellitus, osteoarthritis, infertility, impotency andmany psychological. Ayurveda is one of the highly developed indigenous systems of medicine in the world. The classical *Mahapasmul* Decoction had not been subjected to any scientific study to evaluate its efficacy on *Sthoulya* and *apathyanimittajaprameha*.

**Objectives**

This study was carried out to evaluate the efficacy of *Mahapasmul* Decoction on *Sthoulya* and *apathyanimittajaprameha*.

## METHODOLOGY

The present study is a clinical study in which patients who fulfilled the criteria were selected from Ayurveda Teaching Hospital at Borella, Colombo 08, Sri Lanka from period of January 2015 to May 2016.Both male and female patients, between 20 -60 years of age, who had BMI between 25 to 45 kg/m $^2$and FBS less than 200 mg/dl were included in the study.Sixty (30) patients were treated with *Mahapasmul* Decoction at the dose of 120ml at 8.00 a.m & 6.00 p.m before mealwith 5 ml bee honey for a period of eight (08) weeks. Patients were evaluated before starting the treatment and after completing the treatment for their subjective as well as objective criteria.Subjective criteria (symptoms of *sthaulya* and *apatyanimittajaprameha*) were assessed with proper grading according to their severity.Objective assessment criteria were BMI, body circumferences, skin-fold thickness, lipid profile and FBS.[10] Specific diet was recommended to each patient during the period of treatment. Data were analyzed by SPSS statistical software. Qualitative data were analyzed by Wilcoxon Sign Rank test and Mann-Whitney test whereas quantitative data were analyzed by paired and unpaired students 't' tests.

[8]Obesity and overweight-Fact sheet No. 311, 2012. http:// www.who.int/media centre/factsheets/fs311/en/index.html

[9]Centre for Public Health Excellence at NICE (UK), National Collaborating Centre for Primary Care (UK), "Obesity: The Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children," National Institute for Health and Clinical Excellence (UK) (NICE Clinical Guidelines, No.43), 2006. http:// www.ncbi.nlm.nih.gov/books/ NBK 63696).

[10]An International Quarterly Journal of Research in Ayurveda /AYU 2014 Jan-Mar; 35(1): 28–34 Shri Kant Tiwari Department of *Kaya Chikitsa*, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India).

## RESULTS AND OBSERVATION

Majority of patients were in 40-49 age group (48.33%), female (93.33%), married (93.3%), housewife (76.7%), had secondary education (78.3%), belonged to middle socio-economic status (86.7%), and lived in suburban areas (66.7%). Considering the family history, obesity and type II DM were among sisters (41.7%), mother (38.3%) and father (30.0%). The majority of patents had mixed diet (90%); *adayasana*(53.3%), *vishamasana*(36.7%) and *virudhasana* (25%); food rich in *snigdha* (73.3%) and *guruguna* (70.0%); *madhurarasa* (58.3%); and *visamagni*(53.3%). Considering the life style, the majority of patients had no exercise (68.3%), had excessive sleep (61.7%) and day sleep (36.7%). *Vata-kaphaprakriti* (58.3%) were more common among *sthaulya* and *apatyanimittajaprameha.* All most all patients had *avara* state of *abayavaranashakthi* and *avarajaranashakthi* (each 100%).

**Effect of *Mahapasmul* Decoction on *Sthaulya* and *Apathyanimittajaprameha***

The improvement of the mean value of*sphik-chalata* (from 3.65 to 3.04), *anga-gaurava* (from 3.39 to 2.50), *anga-daurgandaya* (from 3.67 to 2.46), *ati- kshudha* (from 2.00 to 0.40)*, daurbalya* (from 3.35 to 2.41)*, gathra-sada* (from 3.37 to 2.53)*, udara-chalata* (from 3.36 to 2.69) and *sthana – chalata* (from 3.56 to2.84) was statistically highly significant ($p<0.001$). The improvement of the mean value of *ati- trisha* (from3.55 to 2.55), *seweda-abadha*(from 3.28 to 2.56), *utsaha-hani* (from 3.40 to 2.80), *swasa* (from3.60 to2.60) and *nidradikya* (from3.57 to 2.64) was statistically significant ($p< 0.05$). The mean value of mid arm circumference (from 34.65±0.74 to 32.470.70), waist circumference (from 103.97± 2.14 to 98.982.16) and hip circumference (from 111.84 2.23to 106.84±2.40) was reduced in statistically highly significant manner ($p<0.001$).The mean value of BMI was reduced from 35.30±0.85 to 32.53±0.92 which is statistically highly significant ($p<0.001$).The mean value of skin fold thickness over middle portion of the bicep (from 24.7±1.62to 22.8±1.61), triceps (from 24.7±0.97 to 21.20±0.86), supra iliac (from 41.13±0.97 to 39.13±1.03), mid-thigh (from 42.30 ±0.73to 39.87±0.90) and umbilicus (from 39.93 ±0.95 to 38.07±0.90) was reduced in statistically highly significant manner ($p< 0.001$). The mean value of triglyceride (from 122.7 ±1.68to126. 45±1.10), Fasting blood sugar (from 95.68 ±1.67to 91.91± 1.54) was reduced in statistically highly significant manner ($P<0.001$), whereas the mean value of LDL (from 144.10±5.90 to 123.80±7.40) was reduced in statistically significant ($p<0.05$). According to the reduction of mean value of total cholesterol and HDL was insignificant ($p>0.05$). The mean value of Skin Fold Thickness over middle portion of the Bicep (from 24.7 ±1.62 to 22.8±1.61), Triceps (from 24.7±0.97 to 21.20±0.86), Supra iliac (from 41.13±0.97 to 39.13±1.03), Mid-thigh (from 42.30±0.73 to 39.87±0.90) and Umbilical region (from 39.93 ±0.95to 38.07±0.90) was reduced in statistically highly significant manner ($p<0.001$).

## DISCUSSION

In this study, collectively, 80% of patients belong to the age group of 30-49 meaning young adults and middle aged people are more prone to have obesity. The majority of *sthaulya* patients are female (93.33%).

**Table 1. Effect of *Mhapasmul* Decoction on body circumferences**

| Parameter | Mean | | SD± SE | | t | P |
|---|---|---|---|---|---|---|
| | BT | AT | BT | AT | | |
| Mid Arm Circumference | 34.65 | 32.47 | 4.05 ±0.74 | 3.83± 0.70 | 4.43 | p<0.001 |
| Waist Circumference | 103.97 | 98.98 | 11.74± 2.14 | 11.87±2.16 | 8.34 | p<0.001 |
| Hip Circumference | 111.84 | 106.84 | 12.21±2.23 | 13.18±2.40 | 9.27 | p<0.001 |

**Table 2. Effect of *Mhapasmul* Decoction on Lipid profile and Fasting Blood Sugar**

| Parameter | Mean | | SD± SE | | t | p |
|---|---|---|---|---|---|---|
| | BT | AT | BT | AT | | |
| Total Cholesterol | 221.06 | 205.19 | 59.82±10.92 | 54.82±9.89 | 0.10 | p>0.05 |
| Triglyceride | 122.73 | 126.45 | 9.23±1.68 | 6.06±1.10 | 4.80 | P<0.001 |
| LDL | 144.10 | 123.80 | 32.34±5.90 | 40.58±7.40 | 3.33 | p<0.05 |
| HDL | 52.97 | 52.85 | 28.54±5.21 | 21.53±3.93 | -0.67 | p>0.05 |
| FBS | 95.68 | 91.91 | 9.19±1.67 | 8.14± 1.54 | 4.59 | P<0.001 |

**Table 3: Effect of *Mhapasmul* decoction on Skin Fold Thickness of *sthaulya***

| Parameter | Mean | | SD± SE | | t | P |
|---|---|---|---|---|---|---|
| | BT | AT | BT | AT | | |
| over Bicep | 24.70 | 22.80 | 8.91±1.62 | 8.82±1.61 | 1.41 | P<0.001 |
| over Triceps | 24.07 | 21.20 | 5.33±0.97 | 4.75±0.86 | 1.92 | P<0.001 |
| over Supra iliac | 41.13 | 39.13 | 5.36±0.97 | 5.66±1.03 | 1.53 | P<0.001 |
| over Mid thigh | 42.30 | 39.87 | 4.04±0.73 | 4.93±0.90 | 1.47 | P<0.001 |
| over Umbilical region | 39.93 | 38.07 | 5.21±0.95 | 4.95±0.90 | 1.32 | P<0.001 |

According to a study conducted byAI-Isa AN- Prevalence of obesity among adult Kuwaitis: a cross-sectional study, it has been reported that obesity (BMI ≥ 30.0) is, at present, estimated to be about 40.6% in adult females are obese.[11] Hence, it is evident that females are more vulnerable to develop obesity. The majority of patients are married (93.3%), housewives (76.7%), having secondary education (78.3%), belonging to middle socio-economic status (86.7%) and living in suburban areas (66.7%). The majority of the patients are having gradual onset (98.3%). Considering the family history, obesity is common among sisters (41.7%) and mothers (38.3%). Considering the psychological history, this study reports that majority of the obesity patient having tension (45%) which may be due to the effect of disease. Among female patients, the majority of patients are having regular menstrual cycle (53.6%).The majority of patents are having mixed diet (90%) than the people who take vegetarian diet (10%). Excessive consumption of animal products rich in fat and oil is well established risk factor of obesity. The majority of patients are having *Adayasana*(53.3%) which is a causative factor of *santarpanajanitavyadhi.*[12] Obesity is one among *santarpanajanitavyadhi*. Majority of patient are having *visamagni*(53.3%) and *tikshanagni* (46.7%). The former is due to *vataprakopa* resulting in *sroto-avardha* in the pathogenesis of *sthaulya*. The majority of patients have *madhyakoshta* (48.3%) and regular bowel habit (53.3%). The majority of patients has no exercise (68.3%), has excessive sleep (100%) and day-sleep (61.7%). As a *santarpanajanitavuadhi*, sedentary life style is one of causative factors of *sthaulya*. The 73.3% of patients are having food rich in *Snigdhaguna* (73.3%), *ati-guru* (70.0%) and *ati-madhura* (58.3%) which increase *medo-dhatu* resulting obesity.

In this study it is revealed that *Sthaulya* is more common among *vata-kaphaprakriti* (58.3%) indicating this type of *prakriti* is more prone to obesity. All most all patients had*Avara* state of *abhyavaranashakthi*(100%) and *jaranashakthi*(100%). As stated in the pathogenesis, *sthaulya* is associated with increased appetite (*abhyavaharanashakti*) and decreased digestion specially in the latter parts of formation of *dhatu (jaranashakti)*.

## Discussion on the effect of *Mhapasmul* Decoction

*Mhapasmul* Decoction improved *Sphik Chalata*, *Anga Gaurava Angadaurgandaya*, *Ati- kshudha, Daurbalya, Gathrasada, Udara Chalata, Sthana Chalata,* Mid Arm Circumference, Waist Circumference, Hip Circumference, BMI, Skin Fold Thickness over middle portion of the Biceps, Triceps, Supra iliac, Mid-thigh and Umbilical region Triglyceride and Fasting Blood Sugar is statistically highly significant ( p<0.001). *Mhapasmul*decoction is composed of *Katu rasa*(20%), *Tikta rasa* (100%) and *Kashaya rasa* (100%); *Laghuguna* (100%), *Rukshaguna* (66.6%) and *Guru guna* (16.6%); *Ushanavirya* (66.6%); and *Katuvipaka* (100%). *Bilva* is having *thridosagna*, *vatagna*, anti-diabetic, *shothhara*, *deepana*, *pachana* properties. *Agnimantha* is having *kaphaghna, vatagna, deepana, anulomana, pramehagna* and *shothahara* properties. *Shyonaka* is known to have anti-inflammatory and diuretic astringent effects. *Kashmarya* is known to have anti-diabetic, anti-aging, analgesic, diuretic and hepato-protective. *Patala* is having *tridosahara, vatakapha-shamaka*, diuretic, anti- inflammatory, *ruchikaraka*, *agni-deepaka*, *yakruthuttejaka*, *muthrakaraa*, *sewedauthpadaka* properties. *Makshika* (bee honey) is of *thridosagna*, *kapha pitta shamaka*, anti- inflammatory and anti- oxidant properties. Collectively, the pharmaco-dynamic properties of *Mhapasmul*decoction reduce *kapha* and *meda*, increase *agni*. Hence, *Mhapasmul* decoction is responsible for promoting digestive power and correcting *sroto-avarodha*. Collectively,

[11]AI-Isa AN. Prevalence of obesity among adult Kuwaitis: a cross-sectional study. *Int. J. Obese,* 1995; 19:431-433.

[12]Charaka Samhita of Agnivesha (2007); Translated by SharmaP.V, Chaukambha Orientalia, Varanasi (Ch.Su.23).

the pharmaco-dynamic properties of *Mhapasmul* decoction reduce *kapha* and *meda*, increase *agni*. Hence, *Mhapasmul*decoction is responsible for promoting digestive power and correcting *sroto-avarodha*. Due to these pharmaco-dynamic properties, *Mhapasmul*decoction improves most of the subjective as well as objective parameters of *Sthaulya* significantly.

**Conclusion**

By fore going, it may be concluded that *Mahapasmul* Decoction is effective in improving most of the subjective as well as objective parameters of obesity (*Sthaulya*). Finally, it may be suggested that these findings need to be validated by further research having more number of patients with longer duration of treatment.

## REFERENCES

Charaka Samhita of Agnivesha, 2007. TranslatedbySharma P.V, ChaukambhaOrientalia, Varanasi (Ch. Su.21).

Charaka Samhita of Agnivesha, 2007. TranslatedbySharma P.V, ChaukambhaOrientalia, Varanasi Ch.Su. 20).

Charaka Samhita of Agnivesha, 2007. TranslatedbySharma P.V, Chaukambha Orientalia, Varanasi (Ch.Su. 23).

Charaka Samhita of Agnivesha, 2007. TranslatedbySharma P.V, ChaukambhaOrientalia, Varanasi (Ch.Su.22).

Charaka Samhita of Agnivesha, 2007. TranslatedbySharma P.V, ChaukambhaOrientalia, Varanasi (Ch.Su.16).

World Health Organization, "Obesity. Preventing and managing the Global Epidemic, Report of a WHO consultation (WHO Technical Report Series 894), WHO, 2000. http://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/

Worldwide Obesity Trends—Globosity," http://www.anneco llins.com/obesity/causes-of-obesity.htm.

Obesity and overweight-Fact sheet No. 311, 2012. http:// www.who. int/media centre/factsheets/fs311/en/index.html

Centre for Public Health Excellence at NICE (UK), National Collaborating Centre for Primary Care (UK), "Obesity: The Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children," National Institute for Health and Clinical Excellence (UK) (NICE Clinical Guidelines, No.43), 2006. http:// www.ncbi.nlm.nih.gov/books/ NBK 63696).

An International Quarterly Journal of Research in Ayurveda /AYU 2014 Jan-Mar; 35(1): 28–34 Shri Kant Tiwari Department of Kaya Chikitsa, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India).

AI-Isa AN. Prevalence of obesity among adult Kuwaitis: a cross-sectional study. *Int. J. Obese,* 1995; 19:431-433.

Charaka Samhita of Agnivesha (2007); Translated by Sharma P.V, Chaukambha Orientalia, Varanasi (Ch.Su.23).

*******