



ISSN 2456-3110

Vol 2 · Issue 4

July - Aug. 2017

Journal of
**Ayurveda and Integrated
Medical Sciences**

www.jaims.in

JAIMS



Charaka
Publications

Indexed

Multi modal treatment approach in management of *Sthaulya* (Obesity)

Dhaval Dholakiya,¹ Nirmal Alodaria,² Kaushik Vyas,³ Drashti Shah,⁴ S.N. Gupta⁵

¹Lecturer, ⁵Professor & HOD, Dept. of Kayachikitsa, ²Lecturer, Dept. of Roganidana & Vikruti Vigyana, ³Lecturer, Dept. of Shalya Tantra, J. S. Ayurved College, Nadiad, Gujarat, ⁴Dept of Kayachikitsa, I.P.G.T. & R.A., G.A.U, Jamnagar, Gujarat, India.

ABSTRACT

Charaka has emphasized *Sthaulya* (obesity) in planning of treatment according to *Sharira* (*Purusha Prakruti*). Obesity is irreversible blessing from current machinery, vehicle friendly, foody life style. India is prime hub of Obesity due to genetic tendency and lifestyle. According to the WHO, World Health Statistics Report 2012, globally one in six adults is obese and nearly 2.8 million individuals die each year due to overweight or obesity, so present study is the need of the hour. *Apakva Meda Dhatu* along with *Ama* plays a key role in development of the disease and will lead to many life style disorders (*Santarpanotha Vyadhi*). For effective management of this disease Multi-modal treatment approach is the need of time. *Amapachana, Shodhana, Udvartana, Langhana, Lekhana, Pathya Ahara Vihara* etc. treatment modalities are used in *Sthaulya* according to condition of patient and cause of the disease. Multi-modal approach in the management of *Sthaulya* (obesity) is much useful to treat patient successfully.

Key words: *Sthaulya, Obesity, Amapachana, Shodhana, Langhana, Pathya.*

INTRODUCTION

While treating the patient physician has to know “*Purushaprakruti Sharirabheden*” and for that purpose *Sthaulya* is mentioned under broad umbrella of *Ashtau Nindita* (eight undesirable conditions) by *Charaka*.^[1] The patient of *Sthaulya* shows very strange observable fact that their appetite is excessive and whatever they eat is quickly digested, which indicates hyper functioning of the *Jatharaagni* due to increase *Vata* in *Kostha*.^[2] Besides this, the patient suffers from fatigue (*Daurabalya*) laziness, may be due to under

supply of energy, which may be due to hypo functioning of *Dhatvagni*. As a result of *Medo Dhatvagni Mandhya* immature improper *Medo Dhatu* produces, that will lead to vicious cycle of *Sthaulya*.

According to the World Health Organization (WHO), obesity is one of the most common, yet among the most neglected, non communicable health problems in both developed and developing countries.^[3] According to the WHO World Health Statistics Report 2012, globally one in six adults is obese and nearly 2.8 million individuals die each year due to overweight or obesity.^[4] Obesity is stalwartly associated with other metabolic disorders including diabetes, hypertension, dyslipidaemia, cardiovascular disease and even some hormonal disturbances. The risk for these disorders appears to start from a body mass index (BMI) of about 21 kg/m².^[5] Obesity is generally classified as generalized obesity (GO) and abdominal obesity (AO). Individuals with obesity have higher rates of mortality and morbidity compared to non obese individuals.^[6-7] India, with 1.2 billion people is the second most heavily populated country in the world and is currently experiencing rapid epidemiological transition. Under nutrition due to poverty which

Address for correspondence:

Dr. Dhaval M. Dholakiya

Lecturer, Dept. of Kayachikitsa,

J. S. Ayurved College, Nadiad, Gujarat, India.

E-mail: vddhaval@dholakiya1910@gmail.com

Submission Date : 16/08/2017

Accepted Date: 28/08/2017

Access this article online

Quick Response Code



Website: www.jaims.in

DOI: 10.21760/jaims.v2i4.9343

dominated in the past, is being rapidly replaced by obesity associated with affluence.^[8] Industrialization and urbanization also contribute to increased prevalence of obesity. Studies from different parts of India have provided evidence of the rising prevalence of obesity now a days.^{[9],[10],[11],[12]}

Obese adults, relative to those of normal weight, have a 3 times higher prevalence of type 2 diabetes. Morbidly obese adults (obesity class 3; BMI >40 kg/m²), compared with normal weight adults, fair much worse and have up to a 7 times higher prevalence of type 2 diabetes.^{[13],[14]} Gradual weight gain leading to obesity also increases the risk for developing type 2 diabetes^[15] because for each 1 kilogram increase in weight there is an approximate 9% increase in the relative risk for diabetes.^[16]

The causes of overweight and obesity are characterised as a natural reaction to an unnatural situation. The wide and constant availability of foods, many of which are high in salt, sugar and fat, along with more sedentary work and transport patterns contribute greatly. The term 'obesogenic environment' has been coined to describe contexts in which weight gain is passively encouraged. The health and economic impact of this is considerable. Obesity is linked with physical and psychological ill-health and premature death. India is prime hub for Obesity and related diseases.

Thus, *Sthaulya* (Obesity) is burning issue for urban society and for treating the patient without any adverse effect, "A multimodal therapy" base on clinical condition of patient (*Purusham Purusham Vikshaya*) is needed. Multimodal approach itself is a tripod of *Ahara* (*pathya*), *Vihara* / *Vyayama* (exercise) and medicaments (*Shodhana* and *Shamana*).

MATERIALS AND METHODS

For this study, the basic and conceptual materials were collected from the *Ayurvedic* classics namely, *Brihatrayee* and *Laghutrayee*, other texts, literature in Modern science concerned with these principles, scientific journals, dissertations, research papers and from the patients.

For multi-modal treatment approach *Panchakarma* procedures as well as internal medicaments are used.

Trikatu, *Kshara*, *Ushnodaka* are used for *Amapachana* and *Shleshma Chhedana*. *Narayana Taila* and *Tila Taila* are used for *Abhyanga* purpose. *Tila Taila* is used for *Sneha Pana* and *Abhyanga* with *Narayana Taila* and *Tila Taila*, *Svedana* with *Nirgundi* / *Erandapatra*. *Madanfala* and *Madhu* are used for *Vamana*. *Eranda Sneha* and *Trivruta* are used for *Virechana*. *Lodhra*, *Vacha*, *Haridra Churna* are used for *Udvartana*. *Niruha* / *Lekhana* / *Kshara Basti* by *Dashmoola*, *Gaumutra*, *Devdaru*, *Pathyadi Kvatha* is performed. Internal medicaments like *Arogyavardhini Vati*, *Triphala Guggulu*, *Varunadi Kvatha*, *Dashmoola Kvatha*, *Musta Churna*, *Vidanga Churna* etc. are used.

DISCUSSION

Obesity is a chronic disease prevalent worldwide among the people who have sedentary life style and habit of eating too much. The incidence of childhood obesity is also a burning issue for world now days. While global prevalence of obesity continues to increase dramatically, treatment options remain less than optimal. In today's era people have no time at all for their health. The aetiology of obesity is multi factorial; life style is changing drastically and become very fast and busy. Over use of fast-food, pizza and burger culture, vehicle friendly life-style, faulty dietary habits, lack of exercise, more mental work than physical, to use of medications that have weight gain as an undesirable side effect, over burden of work and mental stress lead to Obesity and Obesity induced other disorders. Generally people ignore obesity until it becomes mother of other diseases. Economic and political determinants of available foodstuffs and even social networks may also contribute to obesity.

Obesity promotes a cascade of secondary pathologies including Diabetes, Insulin resistance, Dyslipidemia, Inflammation, Thrombosis, Hypertension, coronary disease, Metabolic syndrome, and Obstructive Sleep Apnoea, lower backache, Osteoarthritis, Osteoporosis.^{[18],[19]}

Atisthauya (obesity) is considered as one of the eight disgraceful conditions as described by *Acharya Charaka*.^[20] A person in whom there is excessive accumulation of *Meda* (fat/adipose tissue) leading to flabbiness of hips, abdomen, and breast has been

categorized as *Atisthula*.^[21] *Medas* is body tissue predominant in *Prithvi* and *Apa Mahabhuta* similar structure to *Kapha Dosh*.^[22] Consumption of *Guru* (heavy to digest), *Sheeta* (cold), *Snigdha* (unctuous), *Madhuradi Kapha*, *Meda-mamsa Vardhaka* drugs along with lack of exercise and sedentary life style result in excessive nourishment of *Medas* while other bodily elements (*Dhatus*) are poor of nourishment. Disproportionately increased *Medas* is responsible for several serious consequences reported in *Charaka Samhita* like *Ayurharsa* (decrease of life span), *Javoparodha* (decrease in enthusiasm and activity), *Krichravayavayata* (difficulty in sexual act), *Daurbalya* (decrease of strength), *Daurgandhya* (bad odour), *Swedabadha* (excess perspiration) and *Kshut Pipasadhikya* (excessive hunger and thirst).^[23]

Due to non veg. food (*Dravyasamanya*) as a principle of “*Samanyam Vruddhi Karanam*” only production of *Mamsa* and *Medo Dhatu* occurs. Food like oily, sweet, milk products which have similar qualities like *Medodhatu* create excessive *Medas* in the body and activity like day sleep (*Divaswapna*) plays a key role in *Sthaulya*. In the patients of *Sthaulya*, *Poshya Medo Dhatu* deposits in micro channels (*Aavrut Marga*) and due to that less energy at the cellular level (*Bhutagnidhatvagni*) create a condition of excessive hunger and thirst. Thus, a vicious cycle of excessive hunger - over eating - again hunger starts. *Mandotsaham* (less activity referring to sedentary lifestyle), *Atisnigdham* (excessive intake of fatty substances), *Atisthaulyam* (gross obesity) and *Mahashanam* (excessive eating) constitute for causation of *Prameha*.^[24] (urinary diseases including Diabetes)

Successful management of obesity requires the understanding and acceptance of a new concept that identifies obesity as not only a simple disease but also a clinical syndrome. On the basis of the above mentioned facts of pathogenesis of *Sthaulya*, it can be said that the treatment plan, which have action on excessive hunger (*Abhyavaharana Shakti*), increases *Dhatvaagni* and *Bhutagni* and at the same time have *Medohara*, *Kaphahara* and *Vatahara* actions, may be suitable for its management.^[25]

Classification of patient base on clinical presentation (*Purusham Purusham Vikshaya*)

1. Patient with Obesity having symptoms of *Shleshma Vruddhi*
2. Patient with Obesity caused by drug therapy
3. Patient with Obesity having more prone features of *Asta Dosh*
4. Patient with central obesity(*Rasa Nimitaja Sthaulya*)
5. Patient with peripheral obesity(*Medo Nimitaja Sthaulya*)
6. Patient with Obesity with *Santarpanotthavikara*
 - Having symptoms of CVS
 - Having symptoms of DM (*Apathyanimitaja*)
 - Having symptoms of Dyslipidemia
 - Having symptoms of Hypothyroidism

For effective treatment tripod of *Pathya*, *Vyayama* (*Yogasana*) and *Chikitsa Upakrama* is essential.

Aharavarga	Pathya	Apathya
Shukadhanya	Yava, Shyamaka, Venuyava, Kodrava, Nivar, Jurna	Godhuma, Navanna, Shali, Shashti
Shamidhanya	Mudga, Rajmasha, Kulattha, Chanaka, Masura, Adhaki	Masha
Shakavarga	Vruntaka, Patrashaka, Patola, Shigru	Kanda Shaka
Phala	Kapittha, Jamuna, Amalaka	Draksha, Kharjura, Madhuraphala
Anya	Takra, Madhu, Ushnodaka, Tiltai, Sarshapa Tail	Dugdha, Ikshu, Navnita, Ghrita, Dadhi
Harita	Adraka, Lashuna	-

Some common food that should be avoided.

- Dairy products especially cheese cream, ice cream, yogurt.

- Meat especially red meat, fried food, grilled food.
- Avoid packaged foods, processed food and restaurant
- Fried foods - pizza, hot dog, burger, doughnuts, French fries.
- Cold drinks

Most of the *Pathya Varga Dravyas* take longer time to digestion but give sense of satiety. Most of *Dhanya Varga Dravyas* have *Katu, Kashaya Rasa* and *Ruksha Guna* also have action on *Medo Dhatu*. *Ushna Virya Dravyas* like *Mudaga, Kulattha, Vruntaka* make *Agni* proper.

Pathya	Apathya
Shrama	Sheetal Jala Sevana
Jagarana	Divaswapa (Day sleep)
Nityabhramana, Chankramana	Atiashana (sedentary life style)
Yana Rohana	Sukhashaiya Sevana
Vyavaya	Avyayama (lack of exercise)

Asana and *Pranayama* useful in treating the disease are;

- *Suryanamaskara*
- *Pawanmuktasana* (Wind Liberating Pose)
- *Utthanpadasana* (Raised Leg Pose)
- *Dvichakrikasan* (Bicycling)
- *Padvruttasan* (Leg rotation)
- *Naukasana* (Boat Pose)
- *Pranayama* (breathing exercise) and Meditation

Day sleep, lack of exercise and sedentary lifestyle have strong impact on body fat tissue and on micro channels. Due to obstruction in micro channels vicious cycle of excessive hunger and excessive food intake happens. Obesity is a disorder of imbalance of food intake and consumption. *Shrama, Chankramana, Vyayama, cycling, different kind of Asanas, Pranayama* is useful to burn calories, consumption and also to open up micro channels (*Srotasa*).

Chikitsa Upakrama in patients of Sthaulya based on clinical condition

1. In patient with Obesity having symptoms of *Shleshma Vruddhi*.

- 1st step: *Shleshma Chedana* by *Trikatu, Pippali, Kshara* with *Ushnodaka*
- 2nd step: If needed do *Vamana Karma* by *Madanafala* with *Madhu*
- 3rd step: Any outdoor sport play like badminton / cricket (follow diet strictly)
- 4th step: *Udvartana* by *Lodhra, Vacha, Haridra Churna*

2. Patient with Obesity caused by drug therapy.

- 1st step: Use *Pippali* or *Sanjivani Vati* with *Ushnodaka* (to nullify drug effect)
- 2nd step: *Snehapana* with *Tila Taila, Abhyanga* with *Narayana Taila, Svedana* with *Nirgundi / Erandapatra*.
- 3rd step: *Virechana Karma* by *Erandasneha* or *Trivruta*.
- 4th step: Any outdoor sport play like badminton / cricket (follow diet strictly)
- 5th step: *Udvartana* by *Lodhra, Vacha, Haridra churna*

3. Patient with Obesity having more prone features of *Asta Dosh*.

- 1st step: Use *Trikatu* or *Sanjivani Vati* with *Ushnodaka*
- 2nd step: *Snehapana* with *Tila Taila, Abhyanga* with *Narayana Taila, Svedana* with *Nirgundi / Erandapatra*.
- 3rd step: *Virechana Karma* by *Erandasneha* or *Trivruta*.
- 4th step: Any outdoor sport play like badminton / cricket (follow diet strictly), *Bhastrika, Bhramari, Suryabhedanam Pranayama, cycling, Suryanamaskara*.
- 5th step: *Udvartana* by *Lodhra, Vacha, Haridra Churna*
- 6th step: Internal medicaments like *Arogyavardhini Vati, Triphala, Guggulu, Varunadi Kvatha, Dashmoola kvatha, Musta Churna, Vidanga Churna*.

4. Patient with central obesity (*Rasa Nimitaja Sthaulya*).

- 1st step: Treatment of *Ajirna* - Use *Trikatu* or *Sanjivanivati*, *Eranda Bhrusta Haritaki Churna* with *Ushnodaka*.
 - 2nd step: *Snehapana* with *Tila Taila*, *Abhyanga* with *Narayana Taila*, *Svedana* with *Nirgundi / Erandapatra*.
 - 3rd step: *Vamana Karma* by *Madanafala* with *Madhu* and *Virechana Karma* by *Erandasneha* or *Trivruta*.
 - 4th step: Any outdoor sport play like badminton / cricket (follow diet strictly), *Bhastrika*, *Bhramari*, *Suryabhedanam Pranayama*, cycling, *Suryanamaskara* (minimum 1 round), *Vajrasana*, *Pavanamuktasana*, *Paschimotanasana*.
 - 5th step: *Udvardana* by *Lodhra*, *Vacha*, *Haridra Churna*
 - 6th step: Internal medicaments like *Arogyavardhini Vati*, *Triphala Guggulu*, *Varunadi Kvatha*, *Dashmoola Kvatha*, *Musta Churna*, *Vidanga Churna*.
5. Patient with peripheral obesity (*Medo Nimitaja Sthaulya*).
- 1st step: Use *Trikatu*, *Sunthi*, *Chitrakadi Vati* or *Sanjivani Vati* along with *Eranda Bhrusta Haritaki Churna* with *Ushnodaka*.
 - 2nd step: *Snehapana* with *Tila Taila*, *Abhyanga* with *Narayana Taila*, *Svedana* with *Nirgundi / Erandapatra*.
 - 3rd step: *Vamana Karma* by *Madanafala* with *Madhu* and *Virechana Karma* by *Eranda Sneha* or *Trivruta*
 - 4th step: *Basti Karma - Niruha / Lekhana / Kshara Basti* by *Dashmoola*, *Gaumutra*, *Devdaru*, *Pathyadi*.
 - 5th step: Any outdoor sport play like badminton / cricket (follow diet strictly), *Bhastrika*, *Bhramari*, *Suryabhedanam Pranayama*, cycling, *Surya Namaskara* (minimum 2 round), *Vajrasana*, *Pavanamuktasana*, *Paschimotanasana*.
 - 6th step: *Udvardana* by *Lodhra*, *Vacha*, *Haridra Churna*
- 7th step: Internal medicaments like *Arogyavardhini Vati*, *Triphala Guggulu*, *Navaka Guggulu*, *Gaumutra Haritaki*, *Varunadi Kvatha*, *Dashmoola Kvatha*, *Musta Churna*, *Vidanga Churna*, *Trifala Churna*.
 - 8th step: Use *Asava-Arista* like *Lohasava*, *Kumari Asava*, maximum use of *Madhu + Udaka*
6. Patient with Obesity with *SantarpanotthaVikara*
- 1st step: Use *Trikatu*, *Sunthi*, *Chitrakadi Vati* or *Sanjivani Vati* along with *Eranda Bhrusta Haritaki Churna* with *Ushnodaka*
 - 2nd step: *Snehapana* with *Tila Taila*, *Abhyanga* with *Narayana Taila*, *Svedana* with *Nirgundi / Erandapatra*.
 - 3rd step: *Vamana Karma* by *Madanafala* with *Madhu* and *Virechana Karma* by *Eranda Sneha* or *Trivruta*.
 - 4th step: *Basti Karma - Niruha / Lekhana / Kshara Basti* by *Dashmoola*, *Gaumutra*, *Devdaru*, *Pathyadi*.
 - 5th step: Any outdoor sport play like badminton / cricket (follow diet strictly), *Bhastrika*, *Bhramari*, *Suryabhedanam Pranayama*, cycling, *Suryanamaskara* (minimum 2 round), *Vajrasana*, *Pavanamuktasana*, *Paschimotanasana*.
 - 6th step: *Udvardana* by *Lodhra*, *Vacha*, *Haridra Churna*
 - 7th step: Internal medicaments like *Arogyavardhini Vati*, *Triphala Guggulu*, *Navaka Guggulu*, *Gaumutra Haritaki*, *Varunadi Kvatha*, *Dashmoola Kvatha*, *Musta Churna*, *Vidanga Churna*, *Trifala Churna*.
 - 8th step: Use *Asava-Arista* like *Lohasava*, *Kumari Asava*, maximum use of *Madhu + Udaka*
7. Having symptoms of CVS: use *Arjuna Churna*, *Chitrakadi Vati*, *Trimada Churna*, *Lashuna Kshirpaka*.
8. Having symptoms of DM (*Apathya nimitaja*): Use *Chitrakadi Vati*, *Trimada Churna*, *Mamejaya*

Ghanvati, Meshshrungi Churna, Jambubija Ghanvati.

9. Having symptoms of Dyslipidemia: Use *Chitrakadi Vati, Trimada Churna, Vidanga Churna, Gaumutra Haritaki, Yavakshara, Triphala Guggulu, Kanchnara Guggulu, Musta Churna, Haridra Churna, Vacha Churna, Karanja Churna*.
10. Having symptoms of Hypothyroidism: Use *Shilajatu, Trimada Churna, Vidanga Churna, Gaumutra Haritaki, Yavakshara, Triphala Guggulu, Kanchnara Guggulu, Musta Churna, Haridra Churna, Vacha Churna, Karanja Churna, Arogyavardhini Vati*.

CONCLUSION

Obesity is irreversible blessing from current machinery, vehicle friendly, junk foodie, sedentary lifestyle. India is prime hub of Obesity due to genetic tendency and lifestyle. *Charaka* has emphasized *Sthaulya* (obesity) in planning of treatment according to *Sharira (Purusha Prakruti)*. *Apakva Meda Dhatu* along with *Ama* and *Rasa Dhatu* play key role in development of the disease and will lead to many life style disorders (*Santarpanottha Vyadhi*). For effective management of the disease Multi-modal treatment approach in the form of *Pathya* (diet), *Vyayama* (exercise) and *Upkrama* (therapy) is the need of time.

REFERENCES

1. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutrasthana, Astauninditiya Adhyaya, 1/21/3, edited by Rajeshvardatta Shastri. Varanasi: Chaukhambha Bharati Academy; 2005;p.407.
2. Agnivesha, Charaka, Dridhabala. Charaka Samhita, Sutrasthana, Astauninditiya Adhyaya, 1/21/5-6, edited by Rajeshvardatta Shastri. Varanasi: Chaukhambha Bharati Academy; 2005;p.411.
3. World Health Organization (WHO). Obesity: preventing and managing the global epidemic. Report of a WHO consultation. (1-253).World Health Organ Tech Rep Ser. 2000;p.894:i-xii. [PubMed]
4. Geneva: WHO; 2012. [accessed on November 28, 2012]. World Health Organization (WHO). World Health Statistics 2012. Available from:http://www.who.int/gho/publications/world_health_statistics/EN_WHS2012_Full.pdf
5. James WPT, Jackson-Leach R, Ni Mhurchu C, Kalamara E, Shayeghi M, Rigby NJ, et al. Overweight and obesity (high body mass index) In: Ezzati M, Lopez AD, Rodgers A, Murray CJL, editors. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. I. Geneva: World Health Organization; 2004;p.497–596.
6. Flegal KM, Kit BK, Orpana H, Graubard BI. Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. JAMA. 2013;309:71–82. [PMC free article] [PubMed]
7. Geneva: Switzerland, WHO; 2009. [accessed on February 3, 2014]. World Health Organization (WHO). Global health risks: mortality and burden of disease attributable to selected major risks. Available from:http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf
8. Mohan V, Deepa R. Obesity & abdominal obesity in Asian Indians. Indian J Med Res. 2006;123:593–6.[PubMed]
9. Bhardwaj S, Misra A, Misra R, Goel K, Bhatt SP, Rastogi KV, et al. High prevalence of abdominal, intra-abdominal and subcutaneous adiposity and clustering of risk factors among urban Asian Indians in North India. PLoS One. 2011;6:e24362. [PMC free article] [PubMed]
10. Deepa M, Farooq S, Deepa R, Manjula D, Mohan V. Prevalence and significance of generalized and central body obesity in an urban Asian Indian population in Chennai, India (CURES: 47) Eur J ClinNutr. 2009;63:259–67. [PubMed]
11. Misra A, Khurana L. Obesity and the metabolic syndrome in developing countries. J ClinEndocrinolMetab. 2008;93(11 Suppl 1):S9–30. [PubMed]
12. Anjana RM, Pradeepa R, Deepa M, Datta M, Sudha V, Unnikrishnan R, et al. The Indian Council of Medical Research-India Diabetes (ICMR-INDIAB) study: methodological details. J Diabetes Sci Technol. 2011;5:906–14. [PMC free article] [PubMed]

13. Mokdad AH, Ford ES, Bowman BA, et al. Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. JAMA. 2003;289:76-79.
14. Field AE, Coakley EH, Must A, et al. Impact of overweight on the risk of developing common chronic diseases during a 10-year period. Arch Intern Med. 2001;161:1581-1586.
15. Colditz GA, Willett WC, Stampfer MJ, et al. Weight as a risk factor for clinical diabetes in women. Am J Epidemiol. 1990;132:501-513.
16. Mokdad AH, Ford ES, Bowman BA, et al. Diabetes trends in the U.S.: 1990-1998. Diabetes Care. 2000;23:1278-1283.
17. www.sciencedirect.com
18. Gallagher E J, Karnieli E, LeRoith D. The metabolic syndrome: From insulin resistance to obesity and diabetes. Med Clin North Am 2011;95:855.
19. Gallagher E J, Karnieli E, LeRoith D. The metabolic syndrome: From insulin resistance to obesity and diabetes. Med Clin North Am 2011;95:931.
20. Agnivesha, Charaka, Dridhabala, Charaka Samhita, Sutra Sthana, Ashtauninditeeya Adhyaya, 21/3, Vaidya Jadavaji Trikamji Acharya. editor. 5th ed. Chaukhamba Sanskrit Sansthan, Varanasi; 2009;p.116.
21. Agnivesha, Charaka, Dridhabala, Charaka Samhita, Sutra Sthana, Ashtauninditeeya Adhyaya, 21/1; Vaidya Jadavaji Trikamji Acharya. editor. 5th ed. Chaukhamba Sanskrit Sansthan, Varanasi; 2009;p.117.
22. Chakrapanidutta, Commentator, Sushruta Samhita, Sutra Sthana, Doshadhatumalakshayavruddhi Vijnaniya Adhyaya, 15/4, editor. Vaidya Jadavaji Trikamji Acharya, 8th ed. Varanasi: Choukhambha Orientalia; 2005;p.68.
23. Agnivesha, Charaka, Dridhabala, Charaka samhita, Sutra Sthana, Ashtauninditeeya Adhyaya, 21/4, Vaidya Jadavaji Trikamji Acharya, editor, 5th ed. Chaukhamba Sanskrit Sansthan, Varanasi; 2009;p.116.
24. Agnivesha, Charaka, Dridhabala, Charaka samhita, Nidanasthana, Pramehanidanam, 4/51; Vaidya Jadavaji Trikamji Acharya, editor, 5th ed. Chaukhamba Sanskrit Sansthan, Varanasi; 2009;p. 215.
25. Agnivesha, Charaka, Dridhabala, Charaka samhita, Sutra Sthana, Ashtauninditeeya Adhyaya, 21/21; Vaidya Jadavaji Trikamji Acharya, editor, 5th ed. Chaukhamba Sanskrit Sansthan, Varanasi; 2009;p.117.

How to cite this article: Dhaval Dholakiya, Nirmal Alodaria, Kaushik Vyas, Drashti Shah, S.N. Gupta. Multi modal treatment approach in management of Sthaulya (Obesity). J Ayurveda Integr Med Sci 2017;4:155-161. <http://dx.doi.org/10.21760/jaims.v2i4.9343>

Source of Support: Nil, **Conflict of Interest:** None declared.
