



## STHOULYA AND AHARA: UNRAVELLING THE AYURVEDIC CONNECTION

Dr. P. Meghana Herale\*<sup>1</sup>, Dr. Manjunatha Adiga<sup>2</sup>

<sup>1</sup>PG Scholar, Department of Kayachikitsa, Sri Kalabyraveshwara Swamy Ayurvedic Medical College Hospital and Research Centre, Bangalore.

<sup>2</sup>Professor and HOD, Department of Kayachikitsa, Sri Kalabyraveshwara Swamy Ayurvedic Medical College Hospital and Research Centre, Bangalore.

Sri Kalabyraveshwara Swamy Ayurvedic Medical College Hospital and Research Centre, RPC Layout Hosahalli Extension, Vijayanagar, Bangalore-560104.



\*Corresponding Author: Dr. P. Meghana Herale

PG Scholar, Department of Kayachikitsa, Sri Kalabyraveshwara Swamy Ayurvedic Medical College Hospital and Research Centre, Bangalore.

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### ABSTRACT

Sthoulya is the most prevalent form of malnutrition extensively seen in developed and developing countries affecting Children as well as Adults. Ayurveda advocates prevention of diseases as its primary aim which can be done through Nidana Parivarjana. Aahara being one among the Trayopasthambha plays a critical role in maintaining a balance among the doshas and preventing diseases like Sthoulya, Prameha etc. No medicine can do good for a patient who does not follow Pathya Aahara. Sthoulya being one among the Kapha Pradhana Vyadhi involves Kapha, Vata, Medas as main Doshas and Dushya in Samprapti.<sup>[1]</sup> Aahara having Guru and Atarpana gunas must be followed like Yava, Mudga, Kulattha in the form of Krutanna Ahara Kalpana which helps in improving Agni.<sup>[2]</sup> More of Katu, Tikta, Kashaya rasa are to be used in the form of spices as Prakshepaka dravyas in Aahara, and use of Takra, Shunti siddha jala are to be advised. And also proper cooking methods like boiling, steaming, grilling instead of frying along with mindful eating helps in proper digestion which yields better outcome.

**KEYWORDS:** Sthoulya, Ahara, Pathya, Obesity.

### INTRODUCTION

Sthoulya is one among the major diseases that falls under the category of *Santarpanajanya Vyadhi*<sup>[2]</sup> wherein *srothorodha* and *agnivaishamyata* occurs. It is an abnormal and excessive accumulation of *Medodhatu* in the body and is one of the *Medodoshaja Vikaras*.<sup>[3]</sup> Acharya Charaka considered *Atisthula* as one among *Ashtonindita Purusha*. Meda is increased in the body due lack of physical exercises, sleeping during day time, consuming food which increases *kapha* and *meda*. A person having pendulous appearance of *sphik*, *udara* and *sthana* due excess deposition of *meda* along with *mamsa dhatu* having unequal and abnormal distribution of *meda* with reduced enthusiasm towards life is called *atisthula*.<sup>[4]</sup>

According to WHO, Obesity is a lifestyle disorder which is the commonest condition among developed and developing countries. Obesity is a disease of caloric imbalance, that results in formation of excess intake of calories that exceeds the demand by the body. According to WHO, a BMI greater than or equal to 25 is considered as overweight and a BMI greater than or equal to 30 is

obesity. The neuroendocrinal feedback associated with pathological overeating coupled with physical inactivity seems to be the major factors governing obesity. Apart from this, genetic predisposition, hormonal imbalance and gut microbial dysbiosis also contribute to the accumulation of fat stores.

Obesity is often associated with a higher risk of mortality and morbidity as it is an important risk factor of non-communicable diseases like Type II Diabetes Mellitus, Hypertension, Dyslipidemia, Osteoarthritis, Cardiovascular disease, Infertility, Polycystic Ovarian Disease as well as psychological disturbances like stress and depression. According to some studies, the cases of obesity and its related comorbidities increased significantly during COVID-19 pandemic. Due to lockdowns during the pandemic, there was a huge increase in cases of obesity. Obesity is a major risk factor for Type 2 Diabetes Mellitus and the two conditions are strongly associated therefore a combination of Healthy eating along with portion control and regular exercise is advised to maintain moderate weight to help prevent or manage Diabetes Mellitus.

Improper functioning of Agni leads to various diseases.<sup>[5]</sup> Therefore the main treatment for all diseases as per Ayurveda is to restore or strengthen the Agni. Ahara Kalpana serves the same purpose.<sup>[6]</sup> So Ahara Kalpana should be included in the dietic preparations for both patients & the healthy individuals. it is classified into Krutanna Varga-Prescribed for healthy individuals.

Pathya Kalpana-prescribed for the patients Both of these groups contain same basic preparations like Manda, Peya, Vilepi, Yavagu and Mamsa rasa. Certain Ahara Kalpanas like Manda, Peya, Yavagu, Vilepi, Krishara, Yusha, Mamsa rasa etc have been described which are easily digestible in increasing order and have curative effects also. However in Pathya Kalpana, the liquid media taken for the preparation are generally the medicated decoctions.

**Purvarupa:** None of Ayurvedic texts has described the *Purvarupa* of *Sthoulya*. *Acharya Charaka*, in *Nidana Sthana*, has mentioned similar pathogenesis of *Prameha* and *Medoroga*, the reason being that in both of them there is vitiation of *Kapha* and *Meda*. Therefore, *Purvarupa* of *Prameha*<sup>[7]</sup> and *Medovaha Strotodushti Lakshanas*<sup>[8]</sup> can be considered as *Purvarupa* of *Sthoulya*. These are as follows.

1. *Atinidra*
2. *Tandra*
3. *Alasya*
4. *Visra Sharira Gandha*
5. *Anga Gaurava*
6. *Anga Shaithilya*
7. *Ati Sweda*

#### Rupa<sup>[9]</sup>

*Medomamsa Ativriddhi, Chala Sphik, Chala Udara, Chala Stana, Ayathaopachaya, Anutsaha.*

#### Ashta Mahadosha

1. *Ayushohrasa* (Diminution of lifespan)
2. *Javoparodha* (Lack of interest in Physical activity)
3. *Kricchra Vyavaya* (Difficulty in having coitus)
4. *Dourbalya* (Debility)
5. *Dourgandhya* (Unpleasant smell from the body)
6. *Swedaabadha* (Excessive sweating)
7. *Kshudhatimatra* (Excessive hunger)
8. *Pipasatiyoga* (Excessive thirst)

#### Samprapti

According to *Charaka*, due to *Srotorodha* by the *Meda*, there is *Vridhhi* of *Koshtasthit Samana Vayu*, which in turn causes *Ati Sandhukshana* of *Jatharagni*. The increase in *Jatharagni* leads to rapid digestion of consumed Ahara and leaves the person craving for more food. If at all due to some reason the person doesn't receive more food the increased *Agni* causes *Dhatu Pachana* which may lead to various complications.<sup>[10]</sup> But because of the hunger the persons tend to eat more and the cycle continues. In this way it becomes a vicious circle creating excessive improperly formed *Medo*

*Dhatu* with giving rise to various symptoms. Because of such condition of *Srotorodha*, the other *Dhatu*s are not nourished properly causing *Shaithilya* (flabbiness) of *Dhatu*s prior to *Meda Dhatu* and depletion of *Dhatu*s next to *Medo Dhatu*s.

According to *Sushruta*, *Kaphavardhaka Ahara*, *Adhyashana*, *Avyayama*, *Diwaswapna* etc. leads to formation of *Ama Rasa* i.e., *Apachit Adya Rasa Dhatu*. The *Madhura Bhavayukta Ama Rasa* moves within the body, the *Snigdhamsha* of this *Ama Rasa* causes *Srotosanga* which leads to *Sthoulya*.<sup>[11]</sup>

#### Chikitsa

The general principle of treatment in *Ayurveda* is

1. *Nidana Parivarjana*
2. *Samshodhana*
3. *Samshamana*

#### Pathya – Apathya

In case of *Sthoulya* i.e., *Pathya* is the most important which an individual should follow.

*Acharya Charaka* advises *Vata, Kapha, and Medohara Anna Pana* for *Sthoulya*.

#### Guna Karma of few Pathya Ahara

##### Mudga (*Vigna radiata*)

It is *Laghu, Medorogahita, Kaphahara*.<sup>[12]</sup> *Mudga* having *Kashaya rasa* brings about *Rukshatha* which mitigates *Kapha dosha* and dries up the *kleda* and *Meda Dhatu* thereby doing *Srotoshodhana*.

*Mudga* can be advised in the form of *Yusha* by adding *Saindhava Lavana, Hingu Mudga Parpata* (Papadums) can be prepared using *Mudga, Jeeraka, Hingu, Maricha* and *Saindhava Lavana*. They are best when roasted on fire and not fried in oil. These are *Agni Deepana*. It is a rich source for carbohydrates and proteins and aminoacids.

*Mudgendari* (Idli made of *Mudga*) is prepared using flour of *Mudga, Hingu, Jeeraka, Adraka*.<sup>[13]</sup> *Mudga* can be used as an alternative to *Shali*. *Mudgadi Kashaya Peya* which consists of *Mudga, Laja* and *Khadira* can be administered in *Sthoulya* which have *Laghu, Ruksha gunas* in common, increasing the *Dhatwagni* and *Kaphahara*. The high fibre content of *Mudga* slows the release of calories into the blood stream. It has a low GI of 31 which makes it a good diabetic food. Clinical trials have shown that green gram supplplantation was found to significantly reduce the S. Total Cholesterol, Triglycerides and LDL Levels in mice fed with high fat diet. It also showed that there was a change in gut microbiota after Green gram administration. was found that mung bean supplementation could reverse the HFD-induced gut microbiota dysbiosis, and promote the growth of some specific bacteria. The decreases in the richness of gut microbiota in HFD-induced obese mice were fully prevented by the consumption of mung bean. These extracts have a potent scavenging activity against

pro-oxidant species and reactive nitrogen species as well as an inhibitory effect on LDL oxidation.

**Yava**(*Hordeum vulgare*)-It has *Kashaya, Madhura Rasa*. *Kashaya Rasa* reduces *Kapha, Pitta* absorbs *Kleda, Meda* leading to *Agni Vardhana* and does *Lekhana Karma*. *Madhura rasa* and *Sheeta veerya* does *vriddhi* of *Sharira dhatu bala*. It has *Ruksha, guru gunas, Kaphahara. Katu vipaka* absorbs *Sneha, Meda, Kleda* present in the body. Has *Agnivardhaka, Lekhana karma*.<sup>[14]</sup>

Acharya Charaka mentioned Yava as a *Nitya sevaniya Dravya*.<sup>[15]</sup> It is considered as a *Lekhaniya Dravya* along with *Ushna jala, Madhu* and *Vacha*.<sup>[16]</sup>

Cited as *Shreshta Dhanya* in *Sushruta Samhita*.

Barley is easily digestible compared to wheat and other grains and is endowed with various active principles including phenolic acid, flavonoids, lignans beta-glucan, folates .dietary fibres have potent anti inflammatory action which could thereby moderate risk of obesity. It is a rich source of Macro and Micronutrients containing coumaric acid and ferulic acid which does anti adipogenic action and inhibition of adipogenesis. Phytochemicals present in Barley is a rich source of antioxidants and fibres which promotes Satiety. It is rich in a type of soluble fibre called beta glucan which is recognized for its cholesterol lowering activities. *Yava* can be advised as a *Pathya* in various *Ahara Kalpana* like *Manda, Yusha, Peya, Vilepi, Sakthu, Anna, Yavagu, Vatya, Utkarika, Krutanna*.

**Takra**- *Takra* is prepared by churning the curd after adding 1/4<sup>th</sup> quantity of water.

*Takra* is *Agnideepana, grahi*, easily digestible having *Kapha-vatahara gunas*. It does not cause *Pitta prakopa* due to its *Madhura Vipaka*. It is useful in *Kapha Prakopa* due to its *Kashaya rasa, Ushna veerya* and *Ruksha guna*. It is useful in *Vata Prakopa* due to its *Madhura Vipaka, Amla Rasa* and *Snigdha Guna*.

In *Vata Prakopa-Amla Takra +Shunti/Amla Takra +Saindhava Lavana*.

In *Kapha Prakopa-Madhura Takra+Trikatu Churna*.

One should take *Takra* for seven, ten days, fifteen days or one month according to *Roga bala* and *Rogi bala*. The quantity of Consumption of *takra* should be in increasing order. Once the maximum dose is reached one should reduce the dose in the same manner. One should not stop the consumption of *Takra* suddenly and it is advised to take in Winter season. Buttermilk is a low calorie high protein beverage, with only 40 calories and 3.31g of protein per 100ml, making it an excellent addition to weight loss diets. Buttermilk has low saturated fat content, making it safe for people with hypercholesterolemia. Clinical trials shows that sphingolipid molecules in buttermilk prevent stomach absorption of cholesterol, resulting in lower cholesterol levels.

### **Vruntaka** (*Solanum melongena*)

It has *Teekshna Laghu Guna* with *Ushna Veerya* and *Katu Vipaka*

Seedless brinjal is cooked in smokeless fire and mixed with *Ardraka, Nimbu, Saindhava Lavana* and *Taila* improves *Agni*.

*Bhatitrikam-Vruntaka* that is burnt dry on coal is mashed, cooked in ghee along with *Saindhava Lavana, Hingu* and other spices. This preparation is called *Bhatitrikam*.<sup>[17]</sup> *Brinjal* that is cooked over *Mrudu Agni* does *Agni Deepana, Vata kaphahara*. *Vruntaka* cooked on *Angara*(fire) is *Kapha-Medo-Anila -Amaghna, Laghu* and *Agni Deepana* but when mixed with *Taila* and *Lavana* becomes *Guru* and *Snigdha*. *Tila Taila Bhrishta Vartaka* is a good appetizer. An in vitro study investigated the inhibitory effect of eggplant on pancreatic lipase activity where the saponins isolated from the methanol extract of eggplant have shown an inhibitory effect on pancreatic lipase activity. This acts as a key enzyme in intestinal fat digestion. These eggplants are high fibre and low calorie which aids in weight management.

### **Lashuna**(*Allium sativum*)

It has *Pancharasa* except *Amla rasa, Snigdha-Teekshna-Guru Guna, Ushna veerya, Katu vipaka, Kapha-Vatahara*. Numerous clinical trials have shown *Lashuna* to be good for the heart by lowering total Cholesterol, LDL Cholesterol and Triglycerides.<sup>[18]</sup> By its *Katu* and *Teekshna Guna* it helps to clear the *Srotorodha* and can be administered in the form of *Ksheerapaka* or along with *Takra* or used along with other spices for seasoning. Garlic extract and specifically *allicin* is known for its weight loss properties, reduction of adipose tissue mass and improvement of plasma lipid profile via the downregulation of multiple genes expression that is included in adipogenesis along with upregulation of mitochondrial inner membrane proteins expression. Moreover, *Allium* appears to affect the composition of gut microbiota along with significant decrease in BMI, weight, waist and hip circumferences. A Clinical Trial showed that consumption of *Allium sativum* extract significantly suppressed body weight gain and White Adipose Tissue(WAT) weight despite daily food intake along with reduction in adiponectin and leptin levels in obese mice. Another Study showed that administration of Garlic Oil to male Sprague Dawley rats for 10 weeks showed reduced body weight and WAT mass.

### **Hingu** (*Ferula asafoetida*)

It has *Katu Rasa, Teekshna Laghu Guna, Ushna veerya* and *Katu Vipaka* which does *Deepana, Pachana, Vata Kapha Prashamana*.

Clinical trials have proved that *Fasafoetida* gum has potent anti-obesity activities, Serum Leptin levels were considerably decreased in treated rats. It plays an important role in the digestion of dietary lipids by stimulating bile flow and enhances the activities of digestive enzymes of the pancreas and Small intestine.<sup>[19]</sup>

**Maricha(*Piper nigrum*)**

It has *Katu rasa, Laghu Teekshna, Sukshma guna, Katu Vipaka, Ushna Veerya* and is *Kapha-Vatahara, Deepana, Chedhana, Shoshana*. A Research study claims that *Piperine*, a component of black pepper inhibits adipogenesis by antagonizing PPAR $\gamma$  activity in adipocytes thus leading to potential treatment for obesity related diseases. Another study showed that black pepper suppressed the effect of body fat accumulation mainly through the action of *piperine*.<sup>[20]</sup> A Clinical Trial showed that rats treated with *P.nigrum* extract 20mg/kg showed reduced weight gain as compared to high fat diet group.<sup>[21]</sup> It can be used to sprinkle over soups, it can be added to fruit juices to nullify the Kapha dominant effect of sweet fruits and can be used as an alternate to Chilly.

**Laja(*Oryza sativa*)**

It has *Kashaya, Madhura rasa, Alpa Ruksha, Laghu Guna, Sheeta Veerya* and is *Kapha Pittahara* and does not aggravate *Vata*. It does *Agni Deepana* and *Medohara*, though possessing *Laghu, Ruksha gunas* and *Sheeta veerya* it pacifies *Vata* because of *Madhura rasa* and it's *Kashaya rasa* and *Alpa Ruksha Guna* is indicated in *Kaphaja rogas*. *Laja* can be administered in the form of *Manda* which is *Laghu*, does *Dhatu poshana, Agni Deepana, Amapachana* and corrects the *Mandagni*.

**Kodrava(*Paspalum scrobiculatum*)**

It has *Madhura Tikta Rasa* and does *Kleda Shoshana, Lekhana*. Kodo millets are rich in B vitamins, especially niacin, B6 and folic acid, as well as the minerals such as calcium, iron, potassium, magnesium, zinc and rich in antioxidants aiding in neutralizing harmful free radicals. It has high protein content (11%), low fat (4.2%) and very high fibre content (14.3%). Instead of eating polished white rice, which has been stripped of its nutrients, one could opt for this, as it contains complex carbs and belongs to the low Glycemic Index foods list, enabling one to lose weight.

It is also enriched with polyphenols, antioxidants, flavonoids etc which aid positive health of an individual while it's Phytoconstituents and phytates content aid in reduction of body weight. These can be administered in the form of *Upma, Poha, Soups, Dosas, Idli* etc.

**Chincha(*Tamarindus indica*)**

It has *Amla Madhura Rasa, Guru Ruksha Guna, Ushna Veerya, Amla Vipaka, Pakwa* and *Madhyama Pakwa Chincha Phala*-It does *Vata Kapha prashamana*. This can be used more in *Varsha Ritu* as it is *Vata hara* and avoided in *Sharath Ritu* as does *Pitta Prakopa*. *Chincha* can be used in smaller quantities everyday by adding with other spices to food or through *Chincha Panaka*. Clinical trials have showed that *Chincha Phala* has Hypolipidemic effect regulating Lipid Metabolism, decreasing Plasma leptin, Serum Cholesterol, Serum LDL levels.

**Chanaka(*Cicer arietinum*)**

It has *Madhura, Kashaya rasa, Laghu Ruksha guna, Sheeta veerya* and is *Kaphahara*. *Brishta Chanaka* is *Vata Kaphahara* and *Laghu*. The *ruksha guna* acts as a good absorbing agent in clearing the *Srotorodha*. *Chanaka* being a low GI food having a good source of proteins, dietary fibres and less fat can be used for weight loss. Recent reports of *Chanaka* consumption resulted in reduced Serum Total Cholesterol and LDL Cholesterol. In a study on animals, adding chickpea to the rat diet helped to successfully stop their body weight from rising. Rats were divided into 3 groups at random and diet having low fat, moderate fat and high fat with chickpea supplements were administered for 8 months. The high fat diet 10% (w/w) chickpea addition slowed the weight growth from six month to the experiment conclusion. Additionally compared to the group that consumed high fat diet, the chickpea treatment caused the low density lipoprotein (LDL) to drop by 23%, high density lipoprotein (HDL) to rise by 35% and the ratio of LDL to HDL to decrease by 30%. This can be administered in the form of *Saktu, Yusha*.

**Jambu(*Syzygium cumini*)**

It has *Kashaya, Madhura, Amla Rasa, Laghu Ruksha Guna, Sheeta Veerya* and *Katu Vipaka* and does *Pachana, Kaphahara* and *Vatakara*. Clinical Trials on Wistar rats have proved that *Jambu* specifically *Jamun* seeds and leaves is effective in lowering Total Cholesterol, Triglycerides and Serum LDL levels which is helpful in reducing Dyslipidemia. It further showed results which states that *Jamun* fruit extract supplementation significantly reduced diet induced obesity, insulin resistance and repaired High fat diet induced Gut-dysbiosis.<sup>[23]</sup> Another Study showed that *Syzygium cumini* seed extract ameliorates HCHF-induced obesity in rat model by modulating lipogenic and adipocytogenic gene expression and also relieved this leptin-resistant state and controlled excess calorie ingestion with decreased adiposity by regulating the adipokine level.

**DISCUSSION**

*Ahara* is considered to be the best among all things which sustains life. According to *Acharya Charaka*, if any human being follows proper code of conduct related to intake of *Pathya Ahara* then he lives for hundred years free from diseases. Proper *Ahara* when consumed in proper quantity helps in the growth of the body whereas if taken in improper quantity it leads to various *Vyadhi Utpatti*. According to *Acharya Kashyapa* no medicine is equivalent to food. *Sukha* and *Dukha* is dependent on the quality and quantity of *Ahara*. In Modern dietics the nature of food is analysed by weighing the dominance of carbohydrates, proteins and fats but *Ayurveda* weighs the properties of food on its individual basis depending upon the nature of the food and the digestive capability of the patient who is going to consume the foods. So the Modern dietics are keener on choosing the types of food articles in the food which will complete the daily fixed

portion of calories. On the contrary, an Ayurvedic physician advices to vary the quantity as per his appetite. In *Sthoulya Ahara* having *Guru-Atarpana guna*, *Kapha Vatahara*, *Medohara*, *Lekhana guna* are to be consumed. *Guru Ahara* is necessary in order to control the increased *Agni* and *Vata* thereby suppressing the *Atikshudha*. *Atarpana Ahara* is needed to reduce the *Meda dhatu* and *Kapha Dosh*. These help in reducing the increased *Medo dhatu*. Analysis of *rasa* in *Ahara* indicates that *Katu*, *Tikta*, *Kashaya rasas* are to be used more in the diet. *Katu rasa* reduces the *Kapha*, *Kleda* and *Meda* by its *Laghu*, *Ruksha*, *Ushna guna*. *Tikta rasa* also has *Laghu*, *Ruksha guna* with *Kledahara* and *Medoshoshana karma*. *Kashaya rasa* is *Kaphahara* and does *Kleda* and *Medoshoshana* due to its *Laghu*, *Ruksha guna*. Commentators like *Chakrapani* and *Gangadhar* have mentioned that *Shokabhojana* and *Alpa bhojana* are best for *Karshana*. They have also emphasized on *Laghu* and *Ruksha ahara sevana*. So *Ahara dravyas* mentioned above have the same properties therefore mentioned in *Sthoulya*.

#### Some Useful tips

1. Avoid eating late at night and do not sleep during the day.
2. Eat only after digestion of previous food.
3. Eat only if you are hungry.
4. Take a light walk after a meal.
5. Try to take Dinner within 7 pm.
6. Exercise for at least 30min/day.
7. Increase the consumption of vegetables in boiled form in the diet and consume food when hot.
8. Chew the food completely before swallowing and concentrate on food without any distraction.
9. Food which is steamed/grilled to be taken rather than fried form.

#### CONCLUSION

Ayurveda advocates *Nidana Parivarjana* as one of the foremost important modes of treatment for all the diseases. *Sthoulya* is one among the lifestyle disorders which can be effectively managed by *Nidana Parivarjana* and intake of *Matrvat Ahara*. *Ahara* having *Guru*, *Teekshna*, *Ushna*, *Ruksha guna Ahara* are advised as they are opposite to *Manda*, *Snigdha*, *Sheeta guna of Vata*, *kapha* and *Meda*. *Kritanna Ahara* like *Manda*, *Peya*, *Vilepi*, *Yavagu* etc all have *Deepana*, *Pachana*, *Kaphahara Karma* which is useful in cases like *Sthoulya*. *Aushadha Sevana* alone cannot alleviate the disease if defective food habits are practiced, on the other hand if appropriate food habits as *Pathya* is included in daily regimen, even *Aushadha Sevana* can be reduced or prevented. *Acharya Sushruta* mentioned that *Vyayama* is the best for reducing *Sthoulya* which is *Kapha Medohara*. Minimal intake of food and excess expenditure of energy through regular exercise would be the basic rule to get rid of Obesity.

#### REFERENCES

1. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Sutra Sthana, Chapter 20, Verse-17, pg-115.
2. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Sutra Sthana, Chapter 21, Verse-20, pg-117.
3. Sushruta, Sushruta Samhita, Nibandha Samgraha Commentary of Sri Dalhanacharya and NyayaChandrika Panjika on Nidanasthana Commentary of Sri Gayadasacharya, by; Vaidya Yadavji Trikamji Acharya, Choukambha Surabharati Prakashan, Varanasi, reprint-2008, Sutra Sthana, 24<sup>th</sup> Chapter, Verse-9, pg-116.
4. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint-2015, Sutra Sthana, Chapter 21, Verse-9, pg-116.
5. Vagbhata. Ashtanga Hridaya, Sarvangasundara of Arunadatta and Ayurvedarasayana commentary of Hemadri, edited by; Harishastri Paradakara Bhisagacharya, Choukambha Orientalia Varanasi, reprint, 2014; Nidana Sthana, chapter-12. Verse-1, pg-513.
6. Sushruta, Sushruta Samhita, Nibandha Samgraha Commentary of Sri Dalhanacharya and NyayaChandrika Panjika on Nidanasthana Commentary of Sri Gayadasacharya, by; Vaidya Yadavji Trikamji Acharya, Choukambha Surabharati Prakashan, Varanasi, reprint-2008, Chikitsa Sthana, 24<sup>th</sup> Chapter, Verse-68, pg-410.
7. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Nidana Sthana, Chapter 4, Verse-47, pg-215.
8. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Sutra Sthana, Chapter 28, Verse-15, pg-179.
9. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Sutra Sthana, Chapter 21, Verse-9, pg-117.
10. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Sutra Sthana, Chapter 21, Verse-5, 6, pg-116.
11. Sushruta, Sushruta Samhita, Nibandha Samgraha Commentary of Sri Dalhanacharya and NyayaChandrika Panjika on Nidanasthana Commentary of Sri Gayadasacharya, by; Vaidya

- Yadavji Trikamji Acharya, Choukambha Surabharati Prakashan, Varanasi, reprint, 2008; Sutra Sthana, 15<sup>th</sup> Chapter, Verse-32, pg-73.
12. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint, 2015; Sutra Sthana, Chapter 27, Verse-23, pg-155.
  13. Kshema Sharma, Kshema Kutuhalam (a work on dietics and well being), Edited by Prof M A Lakshmithathachar and Dr R Shankar, IAIM, FRLHT, Revised first Edition, 2009; pg no-265.
  14. Raja Nigantu.
  15. Agnivesha, Charaka Samhita, Ayurveda Deepika Commentary of Chakrapanidatta, Edited by; Vaidya Yadavji Trikamji Acharya, Choukambha Orientalia Varanasi, Reprint-2015, Chikitsa Sthana, Chapter 15, Verse-117, pg-520.
  16. Acharya Sharangadhara, Sharangadhara Samhitha, Commentary of Adhamalla's Deepika and Kashirama's Gudārtha Deepika, Edited by Parashurama Sastri, Vidyasagar, Choukambha Orientalia Varanasi, Reprint, 2008, Prathama Khanda, 4<sup>th</sup> chapter, Shloka no 10, page no-37.
  17. Kshema Sharma, Kshema Kutuhalam (a work on dietics and well being), Edited by Prof M A Lakshmithathachar and Dr R Shankar, IAIM, FRLHT, Revised first Edition-2009, pg no-196.
  18. Orekhov AN, Grunwald j. Effects of garlic on atherosclerosis. Nutrition  
[https://pubmed.ncbi.nlm.nih.gov/9263259/#:~:text=PMID%3A%209263259,9007\(97\)83010%2D9](https://pubmed.ncbi.nlm.nih.gov/9263259/#:~:text=PMID%3A%209263259,9007(97)83010%2D9)
  19. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5506628/>
  20. <https://www.sciencedirect.com/science/article/pii/S1756464620302358#b0115>
  21. <https://journals.innovareacademics.in/index.php/ijpps/article/view/27942/22399>
  22. [https://www.researchgate.net/publication/321154234\\_Dynamism\\_of\\_Chanaka\\_Cicer\\_arietinum\\_Linn\\_for\\_Human\\_Health\\_A\\_Review#:~:text=According%20to%20contemporary%20research%20based%20studies%20show,the%20risk%20of%20cardiovascular%20disease%2C%20diabetes%2C%20obesity](https://www.researchgate.net/publication/321154234_Dynamism_of_Chanaka_Cicer_arietinum_Linn_for_Human_Health_A_Review#:~:text=According%20to%20contemporary%20research%20based%20studies%20show,the%20risk%20of%20cardiovascular%20disease%2C%20diabetes%2C%20obesity)
  23. Xu J., Liu T., Li Y., Liu W., Ding Z., Ma H., Seeram N.P., Mu Y., Huang X., Li L. Jamun (*Eugenia jambolana* Lam.) Fruit Extract Prevents Obesity by Modulating the Gut Microbiome in High-Fat-Diet-Fed Mice. *Mol. Nutr. Food Res*, 2019; 63: 1–10. doi: 10.1002/mnfr.201801307. [PubMed]