

## ADRAVYABHUTACHIKITSA OF MEDOVAHA SROTODUSHTI WITH SPECIAL REFERENCE TO METABOLIC SYNDROME-A REVIEW

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Article Received on  
21 April 2023,

Revised on 11 May 2023,  
Accepted on 31 May 2023,

DOI: 10.20959/wjpr20239-28490

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### ABSTRACT

**Introduction:** Non-pharmacological management refers to the management without the use of medications. Metabolic syndrome (MetS) is a clustering of at least three of the following five medical conditions: abdominal obesity, high blood pressure, high blood sugar, high serum triglycerides, and low serum high-density lipoprotein (HDL). Metabolic syndrome is associated with the risk of developing cardiovascular disease and type 2 diabetes. The prevalence of MetS in India is between 20 %- 25% and is significantly higher among women than men consistently with increasing age. According to Ayurveda, it can be correlated with diseases related to *Medovaha Srotodushti*, chiefly *Medoroga*, *Santarpanjanya vikara*, *Madhumeha* e.t.c. **Material**

**& Methods:-**the review was done from various Ayurvedic classical texts, modern textbooks, international journals, and online databases like MEDLINE, PubMed, etc were screened using keywords like *Medovaha Srotas*, *Metabolic Syndrome*, *Prameha*, *Santarpanavyadhi*, etc. with their corresponding mesh terms in combination like OR, AND. **Discussion:-** Early stages of Metabolic syndrome can be compared to *Medovaha Srotodushti Lakshana*, the fully developed metabolic syndrome without complications can be related to *Vyadhisankara*, and its complications can be compared to *Updrava* of *Madhumeha*, *Avarana*. The non-pharmacological management includes reassurance, lifestyle modifications including observance of *Dinacharya*, *Ritucharya*, psychotherapy, dietary interventions like intake of

*Pathyaahara*, healthy low-calorie, low-fat diet, and moderate physical activity, implementing *Sadvritta*- the ideal code of conduct, performing *yoga*, acupuncture, medical food, etc.

**Conclusion:-** *Ayurvedic* treatment ideology is based upon a holistic approach that treats the body, mind, and soul instead of treating the symptoms or disease only. Hence, the management of different diseases has been given under three modalities: *Daivavyapashraya*, *Yuktivyapashraya*, and *Sattvavajaya Chikitsa*. Thus, Ayurveda plays a magnificent role in the non-pharmacological management of Metabolic Syndrome.

**KEYWORDS:** *Adravyabhuta chikitsa*, *Medovahasrotus*, *Medo Vikara*, Metabolic Syndrome, Non-Pharmacological Management, *Santarpanavyadhi*.

## INTRODUCTION

*Ayurveda* follows a holistic approach and has never considered an individual's physical, physiological, and psychological aspects as separate entities. The treatments in *Ayurveda* are none other than establishing/maintaining the tissues of body in *Samyavastha* (equilibrium state).<sup>[1]</sup> Therefore, any type of activity done for maintaining or bringing the body tissues in 'Samyavastha' comes under the *Chikitsa Karma* (treatment procedure). It is of two types- *Dravyabhuta* (drug therapy) and *Adravyabhuta* (non-drug/ non-pharmacological therapy).<sup>[2]</sup> *Adravyabhuta chikitsa* is based on different parameters like *Karana dravya* (*mana, disha, kala*), the status of *Mansika dosha* (mental humors), interaction between *Sharirika* and, *Mansika dosha*. Non-drug therapy is as much important as drug therapy and this has been justified by the synonyms given for *Bheshaja* (drug) in *Caraka Samhita*, which are- *Pathya*, *Prayashchitta* & *Hita*.<sup>[3]</sup> *Ayurveda* discusses about three different categories of therapeutic techniques: *Daivavyapashraya*, *Yuktivyapashraya*, and *Sattvavajaya Chikitsa*.<sup>[4]</sup> The *Sattvavajaya* and *Daivavyapashraya Chikitsa* contains *Adravyabhuta* measures in abundance among these three measures. Non-pharmacological management refers to the management without the use of medications that can be correlated to *Adravyabhuta Chikitsa*. This modality of treatment aims at physical, mental, and spiritual well-being and thereby treats the diseases of body, mind, and soul. This modality doesn't involve the administration of any kind of medication. The non-pharmacological management includes reassurance, lifestyle modifications including observance of *Dinacharya*, *Ritucharya*, psychotherapy, dietary interventions like intake of *Pathyaahara*, healthy low-calorie, low-fat diet, and moderate physical activities, implementing *Sadvritta*- the ideal code of conduct, performing *yoga*, acupuncture, medical food, etc.

Metabolic syndrome (MetS) variously known as Syndrome X or Insulin Resistance Syndrome is a clustering of at least three of the following five medical conditions: abdominal obesity, high blood pressure, high blood sugar, high serum triglycerides, and low serum High Density Lipoprotein (HDL). MetS is associated with the risk of developing cardiovascular disease and type 2 diabetes. The prevalence of MetS in India is between 20 %- 25% and is significantly higher among women than men consistently with increasing age. According to Ayurveda, it can be correlated with diseases related to *Medovaha Srotodushti*, chiefly *Medoroga*, *Santarpanjanya vikara*, *Madhumeha* e.t.c. According to Ayurvedic classics, *Nidhana Parivarjana* and *Pathya palana* should be followed in *Santarpanajanya vikara*.

## MATERIAL AND METHODS

MEDLINE (www.pubmed.com) or the PubMed database was screened using keywords like *Medovaha Srotas*, Metabolic Syndrome, *Prameha*, *Santarpanavyadhi*, Non-pharmacological management, etc. with their corresponding mesh terms in combination like OR, AND.

## METABOLIC SYNDROME (MetS)

Metabolism is an important mechanism of our body through which we generate energy and build essential elements for the growth and development. It includes catabolic and anabolic reactions via different metabolic pathways occurring in the body. Irregularities in the body's metabolism itself results in numerous disorders. Genetic predisposition, sedentary lifestyle, faulty eating habits are some of the common factors that can alter metabolism. Since many of the old infectious diseases have been successfully eradicated, Non-Communicable Diseases (NCDs) have taken over as the main cause of morbidity and mortality, both in developed and developing nations. The metabolic syndrome had been the actual global plague among all of these NCDs. The major feature of metabolic syndrome includes central obesity, hypertriglyceridemia, low levels of High Density Lipoprotein (HDL) cholesterol, hyperglycemia and hypertension.<sup>[5]</sup> Numerous international organizations and professional associations, including the World Health Organization (WHO), the National Cholesterol Education Program Adult Treatment Panel III (NCEP:ATP III), the International Diabetes Federation (IDF), and the American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI), have attempted to incorporate different parameters to define MetS.<sup>[6]</sup> (Appendix1). Despite advances in pathophysiology and delineation of risk factors that predispose to MetS, there are many key aspects that remain unclear. The most important risk factors are diet (particularly sugar-sweetened), genetics, aging, sedentary behavior or low-

physical activity, disrupted sleep, mood disorders, high-calorie diet and excessive alcohol use. The great variation in susceptibility and age of onset in individuals with a very similar risk profile, suggests a major interaction between genetic and environmental factors.<sup>[7]</sup>

The incidence of the metabolic syndrome often parallels the incidence of obesity and incidence of type 2 diabetes (one of the outcome of MetS). The estimates of prevalence varies depending on the MetS defining criteria. Overall prevalence of MetS, for instance, was found to be approximately 34.7% based on ATP III criteria, 37.4% based on IDF definition, and 41.6% based on ATP III/AHA/NHLBI criteria in a countrywide survey conducted in Iran in 2007. Prevalence was 45.5% in Tunisia, another country in the Middle East, according to IDF criteria, but only 24.3% according to ATP III criteria. Yet in every country in the Middle East, prevalence was significantly higher in women than in men.<sup>[8]</sup>

### MetS In Ayurveda

Metabolic syndrome (MetS) in Ayurveda, can be correlated with diseases related to *Medovaha Sroto Dushti*, chiefly *Medoroga*, *Santarpanjanya vikara*, *Atisthoulya* and *Madhumeha*. According to Ayurveda, *Agni* plays a crucial part in every metabolic process in the human body.<sup>[9]</sup> *Mandaagni* (poor digestion/metabolism) is mainly caused by vitiated *Kapha dosha*<sup>[10]</sup> and it has been told to be the root cause of almost all diseases.<sup>[11]</sup> The *Meda dhatu*, one of the *Sapta dhatu* (seven body tissues), mimics fat or adipose tissue,<sup>[12]</sup> *Medo-roga* is a term used to describe the excessive production and build-up of *Meda* in the body. *Avyayama* (lack of exercise), *Diwaswapna* (sleeping at day time), *Atibhakshana* of *Medhavardhaka Ahara* (excessive intake of fatty acids), intake of *Varuni* (fermented drink prepared with date tree and palm tree), excessive intake of *Madhura* (sweet), *Snigdha* (unctuous) or other *Kapha Dosha* vitiating food items results in *Medovaha sroto dushti*<sup>[13]</sup> with a redundant increase in *Meda Dhatu*.<sup>[14]</sup> These *Nidana* vitiate *Agni* especially *Medodhatvagni* produce *Aama*, *Kapha* and *Meda* leads to diseases like *Prameha* (diabetes), *Atisthoulya* (obesity), *Gurugatrata* (heaviness of body) mentioned under *Santarpana Janya Vyadhi*.<sup>[15]</sup>

*Madhura ahara* (sweets) that are consumed in excess turn into fat, or *Sneha*.<sup>[16]</sup> It results in deposition of *Meda dhatu* in different parts of body, especially over abdomen. Aberrantly raised *Meda Dhatu* up to the cellular level provides *Abadha Meda*,<sup>[17]</sup> as a substrate for the pathogenesis of *Prameha* including *Madhumeha*. As the causative factors for *Medo dhatu Dushti* & *Kapha* vitiation are nearly similar, vitiated *Kapha* dosha can lead to a condition

*Dhamanipraticchaya*<sup>[18]</sup> and its association with vitiated *Meda dhatu* may result in *Vyanabala Vaishamy* (hypertension).<sup>[19]</sup> Eventually it creates all conditions of *Medo Roga* with *Vyanabala Vaishamy* which simulates with Metabolic syndrome.

### UTILITY OF ADRAVYABHUTA CHIKITSA

Ayurveda is a comprehensive, individualized, and long-lasting system of health founded on logical principles. In contrast to the reductionist approach of modern medicine, Ayurveda follows a holistic approach. In Ayurveda management of any disorder is divided into 3 parts.<sup>[20]</sup>

1. *Nidana Parivarjana* (Avoidance of causative factors)
2. *Shodhana* (Purification therapy for removal of body toxins)
3. *Shamana* (Medication therapy)

*Satvavajaya Chikitsa* (psychotherapy) refers to a non-pharmacological approach aimed at controlling the mind by refraining it from unpleasant things.<sup>[21]</sup> This can be achieved by five methods which are *Jnana* (spiritual knowledge), *Vijnana* (scriptural knowledge), *Dhairya*, (patience), *Smruti* (memory), and *Samaadhi*<sup>[22]</sup> (meditation) which are related to *Adravayabhuta Chikitsa* (Non-pharmacological management).<sup>[23]</sup>

*Nidana Parivarjana* (Root cause elimination) - *Nidana Parivarjana* is “To avoid the risk factors”. Avoid *all Kapha medovardhaka Ahara* like ghee, butter, curd, pizza, burger, rice, fried potato, etc. Excess intake of carbohydrates and fat leads to abnormal visceral adiposity, which initiates a cytokines-mediated pro-inflammatory process and causes the excess formation of FFAs, which occupies the insulin receptors and in turn leads to Insulin resistance and other defective metabolism. Hence, *Snigdha* (oily), *Guru* (heavy), *Pichhila* (unctuous) *Ahara*, *Madyapana* (alcohol intake) as well as *Adhyasana* (overeating behavior), *Avayayam* (Sedentary lifestyle), excessive alcohol intake. etc. should be avoided by patients of metabolic syndrome.

*Langhana* (Fasting):-Among 10 type of *Langhana*, *Upavasa* (*Laghu Anna* or *Ek Kala Bhojana*) and *Pachana* are indicated. *Santarpanajanya Vyadhi*, which encompasses metabolic problems including dyslipidemia, is mostly treated with *langhana*. It is a cure for *Amaja Vikara*, *Sleshma Vikara*, *Amashayagata Vyadhi*, and *Rasapradoshaja Vikara*. *Eka Kala Bhojana* is considered as *Sukha Parinamakara*. Food that is properly and easily digested results in the formation of *Prakrita Dhatu* and proper nutrition for every *Dhatu*. *Langhana*

will lead to *Agni vridhi* and pacify the *Kaphabhuistha Dosha vridhi*.<sup>[24]</sup> A patient must take a diet low in calorie with more minerals and vitamins and should eat less at dinner.

**Pathyapathya:-** This is the unique contribution of Ayurveda and is explained for almost all diseases. It plays an important role as much as medicine and it is rightly mentioned that “if one follows *Pathya*, then there is no need for medicine and if not then also there is no use of therapeutic measures”. The things which are best for *Srotas* are called *Pathyam*, and one which deteriorates the condition is called *Apathya*. The *Pathaapathya* followed in *Santarpanajanya Vyadhi* are mentioned in Table 1.<sup>[25]</sup>

**Table 1: Pathya Apathya.**

<b>Pathya</b>	<b>Apathya</b>
<i>Yava, Kodrava</i>	<i>Godhuma, Navanna, Shali</i>
<i>Mudga, Rajamasha, Kulatha, Chanaka, Dhanyaka</i>	<i>Masha, Tila</i>
<i>Patola, Vrunthaka</i>	<i>Madhura Phala</i>
<i>Takra, Madhu, Ushnodhaka, Sarshapa Taila, Jeerna Madya</i>	<i>Dugda, Draksha, Navaneeta, Grutha, Dadhi</i>
	<i>Anupa, Gramya</i>

**Ritucharya** (seasonal regimens):- *Ayurveda* has outlined several guidelines and routines (*Charya*) on diet and behavior to help people adapt to seasonal changes without disrupting their body's balance. The primary goal of the *Ayurvedic* medical system is prevention which can be accomplished by altering one's food and lifestyle in relation to climatic changes. According to *Ayurvedic* scriptures, this is a crucial component of preventive treatment.

**Dinacharya (Daily Regimen)** includes things that are mandatory to follow regularly so as to maintain a normal equilibrium of *Dosha, Dhātu, Mala*, and *Agni*. It also regularizes a person's biological clock, and aids in the digestion, absorption, and assimilation of food.

**Vyayama (Exercise)**<sup>[26]</sup> renders body light and efficient in activities, improves digestive power, wanes obesity, and renders finely chiseled contours and consistent body structure. Strong individuals who are habituated to fat-rich diet may routinely practice exercise in *Seetakala* (winter) and *Vasantha* (spring), using only half the strength one can gather. In other seasons, it should be done using lesser strength.

**Udvartanam (Upward massage with powdered drugs)**<sup>[27]</sup>: Disintegrates *Kapha*, dissolves away fat, and provides firmness to body parts.

**Intake of appropriate Ahara (diet)** is also indicated as one of the integral components of the umbrella of *Dinacharya*. *Ahara* is included as one of the *Trayopastambha* (three sub-pillars). *Ahara* is one of the most important parts of life for preventing diseases and promoting health. A person should not follow *Vishmashana* (untimely food) and *Adhyashana* (intake of food before digestion of previous food). It can hamper the digestive fire. Drinking water before meals reduces weight and decreases digestion, in the middle, increases digestive capacity, and in the end causes obesity and increases *Kapha*.<sup>[28]</sup> As the *Kapha Dosha* is primarily responsible for the development of metabolic syndrome, foods with *Kapha* aggravating flavours should be avoided, such as *Madhura* (sweet), *Amla* (sour), and *Lavana* (salt), while foods with *Kapha* balancing flavours, such as *Katu* (pungent), *Tikta* (bitter), and *Kashaya* (astringent), should be consumed regularly.

**Role of Yoga:** Yoga aids in mind control, salvation, health maintenance, and the treatment of many diseases spiritually. Numerous research conducted on healthy, obese, hypertensive, and diabetic people have shown that practising *yoga* reduces body fat percentage, boosts lean body mass, normalises the insulin-glucagon ratio, lowers free fatty acid levels, and activates the insulin receptor. Some of the *Asana* mentioned are.

*Pada-Hastasana*:-This *Asana* massages and tones the digestive organs, alleviates flatulence, constipation, and indigestion. Inverting the trunk can increase vitality, improve metabolism, and concentration, and helps in nasal and throat diseases. The dynamic form of *Padahastasana* also helps to remove excess weight.<sup>[29]</sup>

*Ardha Matsyendrasana*:-It gently massages the kidney and the liver and ensures improvement over backache and pain in the hips. The gentle massage in the liver ensures proper functioning and secretion of the hormones, digestion, and thus the production of the insulin hormone that regulates the sugar levels in the blood.<sup>[30]</sup>

*Shashankasana*:- It improves gastritis, indigestion, and constipation. It improves diabetes, poor physique, shortness of height and poor circulation, etc. Improves the flexibility and strength of the spine which can counter all the adverse effects of sedentary life.<sup>[31]</sup>

*Mandukaasana*:-Diabetes, poor physical condition, low stature, poor circulation, indigestion, and constipation are all improved by it. It increases the spine's flexibility and strength, which can offset all of sedentary life's negative effects.<sup>[32]</sup>

*Bhujangasana*:-Regular practice of cobra pose practice leads to improvements in cholesterol and fasting glucose levels. It massages and tones the abdominal organs like the pancreas and liver, stimulating the nervous and circulatory system which in turn helps in controlling diabetes.<sup>[33]</sup>

*Dhanurasana*:-It helps to maintain a strong digestive system which directly or indirectly helps in maintaining the hormonal levels thus controlling diabetes. It also helps in reducing abdominal fat to shape your body slim and improves the flexibility of your spine and body posture.<sup>[34]</sup>

*Suryanamaskara*:-is the combination of several postures along with regular breathing. The practice of Suryanamaskar is a sort of training for the body, mind, and soul. *Suryanamaskara* increases *Agni*, hence increasing the metabolism of *Medodhatu*. It produces *Laghuta* in the body and clears the channels of the body. So it channelizes the *Dhatu paka* process and reduces *Medha* and *Kapha*.<sup>[35]</sup>

***Adravyabhuta chikitsa in Prameha***:-In Prameha, *Ruksha Udvartanam*(hard dry massage), *Vyayama* (exercise), *Nisi jagara* (keeping awake at night), and all other activities which mitigate *Sleshma(Kapha)* and *Medas*(Fat) are beneficial.<sup>[36]</sup> The patient with diabetes who has no money for his treatment should go on a walk of 100 *yojana*, without making use of an umbrella and footwear, adhering to the way of life of an ascetic, dig a reservoir of water by himself, along with a herd of cows subsisting on the dung, urine, etc of the cows.<sup>[37]</sup>

***Sadvritta (code of conduct)*** :-physical & mental decorum which should be followed by everyone on a daily basis which includes behavioral do's & don'ts, eating etiquettes, social rules, rules for study, *Havana Karma*, guidelines for chastity, etc.<sup>[38]</sup> *Acharya Charak* has explained the importance of *Sadvritta* as by following these rules one will lead a healthy life without suffering from any diseases. It also helps in attaining *Moksha* (salvation). It can be taken to mean that a man can achieve all of his goals with a sound mind and body by adhering to these guidelines.<sup>[39]</sup>

***Acharya Rasayana*** (behavioral conduct) has been explained by *Acharya Charaka* which is nothing but the code of right socio-behavioral conduct to be followed by definite methods to lead an ideal ethical way of living.<sup>[40]</sup> Such physical & behavioral conduct definitely grace life with their *Rasayana* effect. *Acharya Rasayana* may act as a *Rasayana* by improving and

promoting all facets of health viz. physical, mental personality, social and physical health.<sup>[41]</sup>

## DISCUSSION

Metabolic syndrome represents a group of metabolic risk factors that are closely associated with lifestyle. The accumulation of adipose tissue in the form of abdominal fat as well as the individual's inactivity are the strongest contributors to metabolic changes. These changes in the background of metabolic syndrome result in the insulin resistance (IR), which illustrates the cachectic nature of metabolic status. Although obesity and IR remain at the core of the pathophysiology of MetS, a number of other factors such as chronic stress and dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis and autonomic nervous system (ANS), increases in cellular oxidative stress, renin-angiotensin aldosterone system activity, and intrinsic tissue glucocorticoid actions, as well as currently discovered molecules such as micro RNAs can also be involved in its pathogenesis. Since muscles are the principal site for the intake, utilisation, and storage of glucose, the development of sarcopenia also promotes the development of insulin resistance. In order to prevent insulin resistance, the myokines released by skeletal muscles have an additional effect on the adipokines secreted by adipose tissue. Non-pharmacological interventions, such as physical activity in conjunction with appropriate nutritional strategy, are primarily aimed at maintaining a healthy body composition, preventing the accumulation of adipose tissue and to inhibit the deterioration of the functional mass of the body. These measures represent both prevention against the development of the metabolic syndrome, as well as parallel therapeutic way in its management.

The initial stage of metabolic syndrome can be compared with *Medovaha Sroto Dusti*. The disease due to vitiated *Meda* shows - premonitory signs & symptoms of *Prameha* and *Ashta nindita purusha*. Further middle-stage metabolic syndrome turns into type 2 diabetes mellitus and coronary artery diseases and conditions like *Vyadhi Shankara*. So with the gradual progress of the disease it becomes difficult conditions to treat. So it is better to treat this disease before it reaches to middle or later stage condition involving and *Upadrva of madhumeha Avarana*.<sup>[42]</sup>

Non-pharmacological management, i.e., *Adravyabhuta Chikitsa* plays a prime role in the management of *Medovaha Srotas Vikara* (disorders of the channels carrying fat tissue). *Daivavyapasraya Chikitsa* (divine therapy) & *Satvavajaya Chikitsa* (psychotherapy) plays a magnificent role in *Adravyabhuta Chikitsa*. Compliance of the principles of *Ritucharya* (seasonal regimen), *Dinacharya* (daily regimen), *Sadvritta* (code of conduct), *Acharya Rasayana* (behavioral conduct), etc. helps in maintaining the integrity of *Agni* as former

balance the *Dosha*. *Nidana Parivarjana* should also be followed by avoiding *Nidana* like *Adhyashana* (eating before the digestion of previous food), *Anashana* (no intake of food), *Vegadharana* (suppression of urges), etc. *Acharya* has defined *Ashta Ahara Vidhivisheshayatana* (eight rules for consuming food) and *Dwadasha Ashanpravicharana* (the twelve kinds of food administration) in a very systematic and scientific manner. It gives basic dietary guidelines about choosing appropriate food, the combination of food, cooking method, quality, and quantity of food. A thorough understanding of *Ashta Ahara Vidhivisheshayatana* will help in reducing *Agni Dushti* (digestive distress) and achieving both aims of *Ayurveda* i.e., maintaining the health of a healthy individual and also curing the ailment of the diseased one.

## CONCLUSION

Both developed and emerging nations, including India, are seeing an alarming rise in MetS cases. The observable truth is that the precise mechanism of MetS's complicated pathways is not yet fully understood, although hereditary factors, high-calorie food, unhealthy lifestyle, stresses, central obesity, and endocrine abnormalities all play significant roles in the disease's pathophysiology. The growing understanding of MetS bears significant similarities to the over-nutritional (*Santarpanjanya Vikaras*) ailments of Ayurveda, such as *Sthaulya/Medoroga* (obesity/dyslipidemia), *Prameha* (diabetes), and *Hridroga* (cardiovascular diseases). The conventional management of metabolic syndrome is still not very satisfactory and also due to the poorly understood pathology have compelled us to explore of the scope of non-pharmacological management in MetS. *Ayurveda* is serving the universe for ages with its perfection. Prevention is better than cure perfectly matches this system. Thus, *Ayurveda* has got a magnificent role in the *Adravyabhuta chikitsa* (non-pharmacological management) of MetS.

## Appendix 1

### WHO 1999

Presence of insulin resistance or glucose > 6.1 mmol/L (110 mg/dl), 2 h glucose > 7.8 mmol (140 mg/dl) (required) along with any two or more of the following

1. HDL cholesterol < 0.9 mmol/L (35 mg/dl) in men, < 1.0 mmol/L (40 mg/dl) in women
2. Triglycerides > 1.7 mmol/L (150 mg/dl)
3. Waist/hip ratio > 0.9 (men) or > 0.85 (women) or BMI > 30 kg/m<sup>2</sup>
4. Blood pressure > 140/90 mmHg

**NCEP (National Cholesterol Education Program) ATPIII2005**

Presence of any three or more of the following

1. Blood glucose greater than 5.6 mmol/L (100 mg/dl) or drug treatment for elevated bloodglucose
2. HDL cholesterol < 1.0 mmol/L (40 mg/dl) in men, < 1.3 mmol/L (50 mg/dl) in women or drug treatment for low HDL-C
3. Blood triglycerides > 1.7 mmol/L (150 mg/dl) or drug treatment for elevated triglycerides
4. Waist > 102 cm (men) or > 88 cm (women)
5. Blood pressure > 130/85 mmHg or drug treatment for hypertension

**IDF (International Diabetes Federation) 2006**

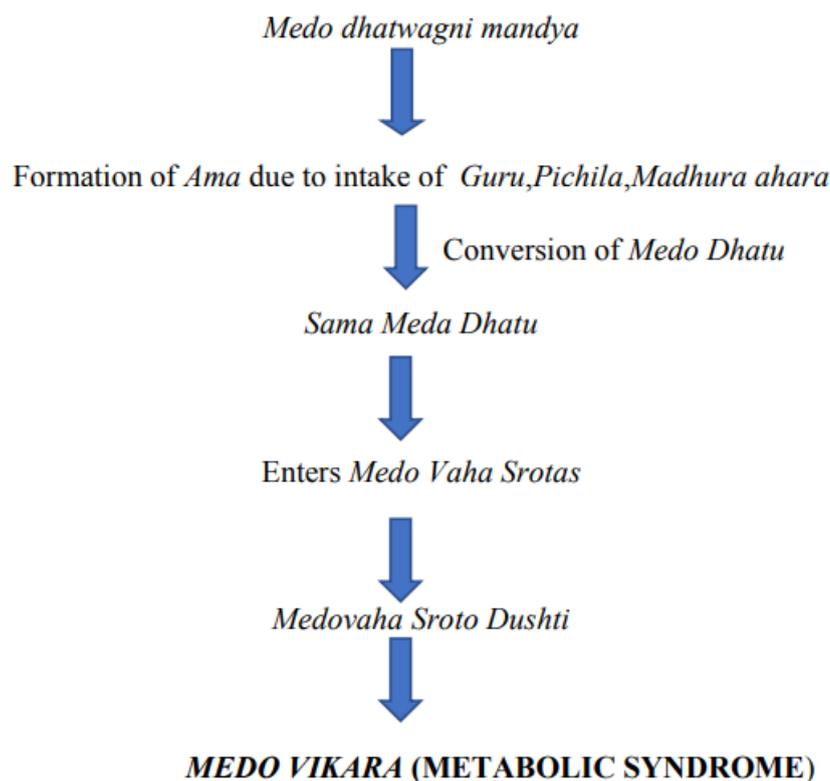
Waist > 94 cm (men) or > 80 cm (women) along with the presence of two or more of the following:

1. Blood glucose greater than 5.6 mmol/L (100 mg/dl) or diagnosed diabetes
2. HDL cholesterol < 1.0 mmol/L (40 mg/dl) in men, < 1.3 mmol/L (50 mg/dl) in women or drug treatment for low HDL-C
3. Blood triglycerides > 1.7 mmol/L (150 mg/dl) or drug treatment for elevated triglycerides
4. Blood pressure > 130/85 mmHg or drug treatment for hypertension

**American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI) criteria (2004)**

Any three of the following:

1. Waist circumference 102 cm or greater in men, 88 cm or greater in women.
2. Triglycerides 150 mg/dl or greater.
3. HDL-cholesterol < 40 mg/dl in men and < 50 mg/ dl in women.
4. BP 130/85 mmHg or greater.
5. Fasting glucose 100 mg/dl or greater.



**Fig. 1: Pathophysiology of Meda Vikara (Metabolic Syndrome).**

*Agni* plays a crucial part in every metabolic process in the human body particularly *Medho dhatu agni* in MetS.

## REFERENCES

1. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Chikitsaprabhritiya adhyaya (16; 34), P. 328, Chaukhambha Bharti Academy, Varanasi, 2013.
2. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Vimanasthana,, Rogabhishagjitiya adhyaya (8; 87), P. 768, Chaukhambha Bharti Academy, Varanasi, 2013.
3. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita Chikitsasthana, Abhayamlakiya Rasayanapada adhyaya (1[1]; 3), P. 2, Chaukhambha Bharti Academy, Varanasi, 2012.
4. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Tisreshaneeyam Adhyaya; Chapter 11, Verse 54, Varanasi, Chaukhambha Subharati Prakashan, 2020; 77.
5. Kasper, Fauci et al Harrison's Principle of Internal Medicine, McGraw Hill 249 education, 19th edition, 2015; 2449.

6. Eva Kassi et al Metabolic syndrome: definitions and controversies BMC Medicine, 2011; 9: 48. <http://www.biomedcentral.com/1741-7015/9/48>
7. Ordovas JM: Genetic links between diabetes mellitus and coronary atherosclerosis. *CurrAtheroscler Rep*, 2007; 9: 204-210.
8. Mohammad G. Saklayen, The Global Epidemic of the Metabolic Syndrome, *Current Hypertension Reports*, 2018; 20: 12. <https://doi.org/10.1007/s11906-018-0812-z>.
9. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Chikitsa sthana, Grahinidoshachikitsitam Adhyaya, Chapter 15, Verse 3-4, Varanasi, Chaukhambha Subharati Prakashan, 2020; 512.
10. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Vimanasthana, Roganikam vimana adhyaya, Chapter 6 ,Verse 12, Varanasi, Chaukhambha Subharati Prakashan, 2020,255.
11. Hari Sadasiva Sastri Paradakara Bhisagacarya, Vagbhata, Ashtanga Hrudaya, Nidhanasthana, Udararoga nidhana; Chapter 12: Verse 1, Varanasi, Chaukhambha SubharatiPrakashan, 2020; 497.
12. Goverdhanam vani & JSRA Prasad. Concept of Dhatvagnipaka in Ayurvedic perspective incomparision with tissue metabolism. *Int. J. Res. Ayurveda Pharm*, 2016; 7(2): 92-97.
13. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Vimanasthana, Srothasaam vimanam Adhyaya, Chapter 5 Verse 16, Varanasi, Chaukhambha Subharati Prakashan, 2020; 251.
14. Madhavakara, Madhavanidana, Madhukosha Sanskrit commentary by Shrivijayrakshita & Shrikanthdutta, Chapter 34,Verse 1- 4, pg. 28, Chaukhambha Prakashan, Varanasi, 2006.
15. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Santarpaneeya Adhyaya, Chapter 23,Verse 6, Varanasi, Chaukhambha Subharati Prakashan, 2020; 497.
16. Madhavakara, Madhavanidana, Madhukosha Sanskrit commentary by Shrivijayrakshita & Shrikanthdutta, Chapter34, pg. 29, Chaukhambha Prakashan, Varanasi, 2006.
17. Agnivesha, Charaka Samhita, Ayurveda-Dipika commentary by Chakrapanidutta, revised ed., Nidana Sthana Prameha nidhana adhyaya, Chapter 4,Verse7, pg. 212, Chaukhambha Surbharati Prakashan, Varanasi, 2011.
18. Agnivesha, Charaka Samhita, Ayurveda-Dipika commentary by Chakrapanidutta, revised ed., Sutra Sthana (20:17), pg. 115, Chaukhambha Surbharati Prakashan, Varanasi, 2011.
19. Raman Kaushik et al, Management Of Metabolic Syndrome In Ayurveda 4 – A Case Report, ISSN 0970-7700 DOI 10.5455/JREIM.82-1528260487.

20. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Vimanasthana, Vimaan Sthana 7, Vyadharupiyam Adhyaya Chapter 7, Verse 30, Varanasi, Chaukhambha Subharati Prakashan, 2020; 257.
21. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Tisreshaneeyam Adhyaya; Chapter 11, Verse 54, Varanasi, Chaukhambha Subharati Prakashan, 2020; 77.
22. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Dirghanajivitiya adhyaya Chapter 1, Verse 58, Varanasi, Chaukhambha Subharati Prakashan, 2020; 16.
23. Ashutosh A Debnath et al Adravya Chikitsa-A Ayurvedic Holistic Nonpharmacological Approach To Combat Mental Health-A Short Review, International Journal of Ayurveda and Pharma Research, 2021; 9(12): 46-52.
24. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Langhanabrimhaneeya adhyaya, Chapter 22, verse 9, Varanasi, Chaukhambha Subharati Prakashan, 2020.
25. Ajay Kumar Sharma, Kayachikitsa, Part- III, Chaukhamba Publishers, Varanasi, 2009; 178.
26. Hari Sadasiva Sastri Paradakara Bhisagacharya, Vagbhata, Ashtanga Hrudaya, Sootrasthana, Dinacharya Adhyaya, Chapter 2, Verse 10-13, Varanasi, Chaukhambha Subharati Prakashan, 2020; 27.
27. Hari Sadasiva Sastri Paradakara Bhisagacharya, Vagbhata, Ashtanga Hrudaya, Sootrasthana, Dinacharya Adhyaya, Chapter 2, Verse 16, Varanasi, Chaukhambha Subharati Prakashan, 2020; 27.
28. Bulusu Sitaram Bhavmishra, Bhavaprakasha, Purvakhand Chapter 5, Verse 147-149, Vol-I, First Edition, Chaukhambha Orientalia Varanasi, 2006; 81.
29. Kashinath Samgandhi, Swasathvritta Sudha, Ayurveda Sanskrit Hindi Pustakh Bhandar, Jaipur, Edition, 2017; 260.
30. Kashinath Samgandhi, Swasathvritta sudha Ayurveda Sanskrit Hindi Pustakh Bhandar, Jaipur, edition, 2017; 272.
31. Dr. Sarvesha Kumar Aggarwal, Swasthvritta vigyan, Chaukhamba Orientalia, Varanasi, edition, 2015; 142.
32. Dr. Sarvesha Kumar Aggarwal, Swasthvritta vigya, Chaukhamba Orientalia, Varanasi, edition, 2015; 147.
33. Kashinath Samgandhi, Swasathvritta sudha, Ayurveda Sanskrit Hindi Pustakh Bhandar, Jaipur, edition, 2017; 284.

34. Kashinath Samgandi, Swasathvritta Sudha, Ayurveda Sanskrit Hindi Pustakh Bhandar, Jaipur, edition, 2017; 249.
35. Swasathvritta Sudha, Ayurveda Sanskrit Hindi Pustakh Bhandar, Jaipur, edition, 2017; 249.
36. HariSadasivaSastri Paradakara Bhisagacarya,Vagbhata, Ashtanga Hrudaya,Chikitsa sthana, Pramehsa Adhyaya,Chapter 12,Verse 33,Varanasi, Chaukhambha Subharati Prakashan, 2020; 680.
37. HariSadasivaSastri Paradakara Bhisagacarya,Vagbhata, Ashtanga Hrudaya,Chikitsa sthana, Pramehsa Adhyaya,Chapter 12,Verse 36-37 ,Varanasi, Chaukhambha Subharati Prakashan, 2020; 680.
38. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Sootrasthana, Tisreshaneeyam Adhyaya; Chapter 11, Verse 18, Varanasi, Chaukhambha Subharati Prakashan, 2020; 58.
39. Khushboo Bishnoi et al, Importance Of Sadvrutta In Daily Life: A Review Article, WorldJournal of Pharmaceutical and Medical Research, 2020; 6(1): 74-76
40. Yadavji Trikamji Acharya, Agnivesa, Charaka Samhita, Chikitsa Sthana Ayurvedhasamuthaneeyam Rasayana Adhyaya ;Chapter 1(4) ,Verse 30-35,Varanasi, Chaukhambha Subharati Prakashan, 2020; 388-389.
41. Khushboo Bishnoi et al, Importance Of Sadvrutta In Daily Life: A Review Article, WorldJournal of Pharmaceutical and Medical Research, 2020; 6(1): 74-76.
42. Mehta Sahil e al, An Ayurvedic View To Metabolic Syndrome, World Journal of Pharmaceutical Research, ISSN 2277– 7105, 8(1): 581-585.