

A BIRD'S EYE VIEW ON METABOLIC SYNDROME WITH SPECIAL REFERENCE TO OBESITY (STHAULYA)

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ABSTRACT

Metabolic syndrome is a burgeoning global problem. Many features of the metabolic syndrome are associated with insulin resistance. There are 400 million clinically obese adults in worldwide and more than 200 million people who have diabetes. It is a risk factor for coronary heart disease, fatty liver, several cancers and sleepapnoea. However, anyone of these conditions increases your risk of serious disease. For this in modern medicine no exact remedies available. If present also have very many adverse effects. Here Ayurveda plays an important role. Through this paper understanding the possibilities for treating *sthulya* (obesity) even though it is said that “*Na hi sthoolasya Bheshajam*”. In Ayurveda, metabolic syndrome may be correlated with the conditions like, *Medoroga*, *Santarpanajanya vikara* including *Santapanajanya Madhumeha*, *Ati Sthoulya*. All these conditions are interrelated and have similar pathological pathway. Ayurvedic approach to the management of Metaboli syndrome hence is largely in the direction of the treatment of *Medoroga*. It includes the principles like, *Nidana Parivarjana* (avoiding the causative factors), *Ahara* (diet), *Vihara* (life style management) and *Chikitsa* (treatment specific) . Many studies are looking at treatment that might improve some of the symptoms of metabolic syndrome. The clinical features of metabolic syndrome is nearer to *Lakshanas of Medoroga*, hence metabolic syndrome may be compared to *Medoroga*. *Medoroga* is a *Santarpanajanya vikara* where in *Srotorodha*, improper *Agni* and disarrangement of *Tridosha* is present. *Agni* and brings homeostasis of *Tridoshas*.

Keywords: Metabolic syndrome, *Ayurveda*, *Medoroga*, *Santarpanajanya vikara*, *Srotorodha*,

INTRODUCTION

Sthaulya is a condition wherein there will be *ayatopachaya* of *shareera* associated with abnormal

Increase in *medodhatu*. *Charaka samhita* gives one of the best definitions of *Sthaulya* as

" *Medomamsa ativrudhatvat chalasphik udara stana*
Ayathopachaya utsahonaro atisthulauchyate
"1

The increase of the *medo* and *mamsa dhatu* causes flabbiness and thus impairment of abdomen, buttocks and breasts. This improperly formed *medo dhatu* causes *utsahahani* in the individual; such a person is called *atisthula*. *Sthaulya* can be correlated absolutely with Obesity. Obesity is an abnormal growth of the adipose tissue due to an enlargement of fat cell size or an increase in fat cell number or a combination of both.

Nidana of *Sthaulya* can be broadly classified into *bahyanidana* and *abyantaranidana*. *Bahyanidana* includes *ahara*, *vihara*, *manasika nidana* while *abhyanthara nidana* includes *beejadusti*. *Nidanas* of *sthoulya* can be summarized as *aharajanidana*, *viharajanidana*, *Manasika nidana* and *bijadosha swabhava*. *Aharajanidanas* are *adhyashana* (eating when the

previous food is not digested), *atisampurana* (over eating), *atibrumhana* (eating foods high in calories), *guru ahara* (foods which are heavy to digest), *madhura ahara* (foods having sweet taste), *snigdha ahara* (oily foods), *sheeta ahara* (cold foods), *navanna* (freshly harvested grains), excessive use of *navamadya* (freshly prepared alcohol), *gramya rasa* (domestic animal's meat and soups), *payavikara* (milk and its preparations like curd, ghee), *ikshuvikara* (sugarcane and its products), *guda* (jaggery), *godhuma* (wheat), *mashasevana* (black gram). *Viharaja nidanas* are *avyayama* (lack of physical exercise), *avyavaya* (lack of

sexual intercourse), *divaswapna* (sleeping during the day time), *asana sukha* (remaining seated for a long time), *bhojanottarasnana* (idle sitting after taking food), *swapnaprasangat* (excessive sleep). *Harshanitya* (always being cheerful), *achintana* (lack of proper mental activities), *priyadarshana* (constantly seeing those things which are liked), *manasovivritti* (relaxation of the mind) and *saukhya* (happiness) are *manasikanidana*'s. *Charaka samhita* mentions the cardinal symptoms of *Sthoulya* as *medomamsaativrudhi* (excessive accumulation of *meda* and *mamsa*), *chalasphik, udara, stana* (flabby buttocks, abdomen, breasts due to excessive fat deposition), *ayathopachaya-anutsaha* (improperly formed *medodhatu* causes *utsahahani* in the individual). Besides the *lakshana*, eight detrimental effects of *Sthaulya* have also been explained as follows *ayushohrasa* (diminution of lifespan), *javoparodha* (lack of interest in physical activity), *kricchravyavaya* (difficulty in having coitus), *dourbalya* (debility), *dourgandhya* (unpleasant odour from the body), *sweda atipravriti* (excessive sweating), *kshudhatimatra* (excessive hunger) and *pipasatiyoga* (excessive thirst). Some of health hazards mentioned for obesity are hypertension, diabetes mellitus, coronary artery diseases, stroke, hyperlipidaemia, varicose veins, abdominal hernia, lowered fertility, gall stones. *Charaka samhita* has mentioned the bad prognosis of *Sthaulya* as an obese person if not duly managed, will die soon due to excessive hunger, thirst and other complications.²

The metabolic syndrome refers to the co-occurrence of several known cardiovascular risk factors, including insulin resistance, ob-

esity, atherogenic dyslipidemia and hypertension. These conditions are interrelated and share underlying mediators, mechanisms and pathways. There has been recent controversy about its definition and its utility. Obesity is a chronic and increasingly common disease globally, characterized by excess body fat. It develops gradually and often persists throughout life. As a preventable cause of death, obesity is second only to smoking. Like any other chronic condition, such as diabetes or hypertension, obesity worsens when strategies applied for weight reduction are withdrawn. If it is not treated, for the duration of the patient's life, obesity emerges as a potent co-morbid risk factor. Obesity has been described in *Charaka samhita* in the context of body phenotypes. The rapid spread of urbanization, industrialization and dramatic life style changes that accompany these trends has led to the pandemic of obesity even in developing countries. Obesity has serious public health implications. Excess weight has been associated with mortality and morbidity. There are 400 million clinically obese adults in worldwide and more than 200 million people who have diabetes. Obesity is a multi-factorial condition. The factors playing a role in eating and weight control.²³

Over weight is associated with an increased rate of mortality at all ages. The level of excess mortality varies more or less in proportionate to the degree of obesity. Obesity can be assessed by assessing tools like body weight, body mass index, skin fold thickness, waist-hip ratio. Overweight and obesity have reached epidemic proportions in India in the 21st century affecting 5 % of country's popu-

lation. As much as two thirds of adults in the developed nations are overweight or obese. Recent surveys show that there are more than 1 million obese adults worldwide. India ranks among the top 10 obese nations of the world and about one million urban Indians are overweight or obese. No wonder that the World Health Organization has concluded that obesity is the major unmet public health problem worldwide. Obesity is a health hazard and detriment to well-being which is reflected in the increased mortality and morbidity. The most fundamental and perhaps important task in to combat the epidemic of obesity is prevention.

Metabolic Syndrome is mainly due to abnormal metabolism of *Meda*, though from the beginning of the digestive process *meda* may formed from *ahara rasa* specially which is having profuse quantity of *Sneha*. That is rightly said by *Acharya Kanthadatta* in his '*Madhukosha*' commentary – '*Snehat medo janayati*'.³

By *Jatharagni Paka* induces following changes.

Step 1: *Guru* into *Laghu* & *Sthula* into *Sukshama* i.e. long chain TG into Short chain TG

Step 2: *Sara Bhaga* formed at the end of digestion by *Jatharagni* undergoes *Bhutagni Paka*, where the *Laghu Guna* is again converted into *guru* i.e. Re-esterification of TG, which occurs in the mucosa of small intestine.

Step 3: *Sneha* is subjected to *Dhatvagni Paka*. According to *Kedarikulya Nyaya*, *Sneha* goes to all the *Dhatu* and undergoes digestion by their respective *Dhatvagnis* as per the re-

quirement, uptake and utilization. For e.g. digestion of *madhura rasayukta Sneha* occurs by *Medo-Dhatvagni*, by passing the digestion by *rasadi agnis*. *Medodhatuagni* extracts identical particle and add those to the bulk of *medodhatu*. *Bhutagni* even converts the residual portion of *dhatvagni* to *mala* component ie, *swe-da*, resulting excessive sweating in obese person.⁴

Pathogenesis of Obestiy (Modern Perspective)

Absence of physical activity and other *nidana sevana* especially *kapha vardhaka aharas*, which in turn causes increase of *medas*. This obstructs the *srothases* and block further nourishment. So, only *medas* accumulates in large quantities and making the person incapable of all activities.^{1,2}

Adult onset obesity is characterized predominantly by adipose cell hypertrophy with minimum hyperplasia. Apart from the increase in size of normal depots, eg. subcutaneous tissue, omentum, the retroperitoneal tissues and epicardium, adipose tissue in obesity may be extended to the tissues, where it is normally absent. Excessive lipid deposition, diminished lipid mobilization and diminished lipid utilization are the three main components in pathogenesis of obesity.

Excessive lipid deposition is due to increased food intake, hypothalamic lesions, adipose cell hyperplasia or hyper lipogenesis. Increased food intake in the form of carbohydrates, proteins and fats by metabolic process lastly converts into fats and gets stored in fat depots.

Diminished lipid metabolism is due to either decrease in lipolytic hormones, abnormality of

autonomous innervating thyroxin and adrenaline which stimulates mobilization of unsaturated fatty acids from adipose tissue, abnormality of these two causes diminishes lipid mobilization, increases lipid deposition and ultimately leads to obesity.

Diminished lipid utilization is either due to ageing, defective lipid oxidation, defective thermo genesis or inactivity. Diminished lipid utilization is the main pathology in middle age obesity.²³

Upadrava (Complications)

Chronic persistence of Obesity leads to the deformity of several systems, and organs thus ultimately leading to death. The following complications are described in Ayurveda

Ama dosha, Apachi, Arsha, Atisara, Bhagandara, Jwara, Kamala, Kasa, Kustha, Mutra Kriccha, Prameha, Pramehapidika, Shlipada, Sanyasa, Udararoga, Urusthambha, Vatavikara and *Vridhhi*^{1,2,4}

Sushruta has described that these complications occur due to grave obstruction of various body channels particularly *medovahas srotas*⁴

The unestablished complications are Diabetes; Heart Diseases; Arthritis; Cancer; Hypertension; Gall stones; Sleep disorders; Piles etc.²³

SADHYASADHYATA (Prognosis)⁷

Krichchrasadhya (Difficult to cure) nature of Obesity has been described by most of the Ayurvedic classics. Moreover, lack of immunity power is mentioned as common feature as well as serious drawback of Obesity. Bad prognosis of *Sahaja* (Congenital) diseases is described in *Charakasamhita*. Therefore prog-

nosis of Obesity can be construed on the basis of general principles of prognosis depicted in Ayurvedic classics which is as follows:

Sukhasadhya

Jatottara Hina Sthaulya having the chronicity of 1 to 5 years and without complications and having BMI between 25 to 30 kg /m² - *Krichasadhya Jatottara Madhyama Sthaulya* having the chronicity of 5 to 10 years with least complications and having BMI between 30 to 40 kg/m²

Asadhya

Sahaja (Congenital) *Sthaulya* is *Asadhya*, *Jatottara Adhika Sthaulya* having chronicity of more than 10 years and with all the complications and having BMI more than 40 kg/m².

Sthaulya Chikitsa (Management of Obesity) 8,10,11

The first line of treatment of Obesity is to avoid the causative factors. *Nitya langhana* therapy (Reducing Therapy) and *Langhana* even in *Shishira Ritu* (Winter Season) is advised for obesity by Vagbhata. Types of *Langhana* therapy *Vamana*, *Virechana* (Biopurification therapies) etc. are advised for practice according to *Vyadhibala* (strength of the disease) and *Dehabala* (strength of the patient) by *Charaka*. Amongst *Shadvidha Upakrama* (Six fold Therapy), *Langhana* and *Rukshana* (Drying) therapies are more suitable for the management of Obesity. *Langhana*, the line of treatment for Obesity has been further divided into *Samshodhana* (Biopurification therapies) and *Samshamana* (Alleviating Therapies)

Samshodhana

All Obese patients with *Adhika Dosha* (Increased Bio humors) and *Adhika Bala* (More strength) should be treated with *Samshodhana* therapy including *Vamana* (Medicated Emesis), *Virechana* (Medicated Purgation), etc. Being a syndromic condition, *Samshodhana* therapy is highly recommended for obese patients possessing stamina and strength. *Ruksha*, *Ushna*, *Tikta Basti* (Enema containing dry, hot and bitter drugs) are also suggested by *Charaka*. *Ruksha Udvartana* (Dry powder massage) is the *Bahya Shodhana* (External therapy) indicated for the management of Obesity. Exigency use of *Taila* (Oil) is recommended.

Shamana¹⁰

Among the *Shat Upakramas*, *Langhana* and *Rukshana* can be administered in them. Alleviation of *Vata*, *Pitta* and *Kapha* especially *Samana Vayu*, *Pachaka Pitta* and *Kledaka Kapha* (Biohumors) along with reduction of *Medodhatu* by conditioning *Medodhatvagni* is the main goal of treatment of Obesity. Administration of *Guru* and *Apatarpana* articles which possess additional *Vata-Shleshma-meda* (Alleviating *Vata-Kapha-Meda*) properties is considered as an ideal for *Sanshamana* therapy. In *Ashtanga Samgraha* usage of *Laghu* (Light), *Ushna* (Hot), *Ruksha*(Dry), *Tikshna* (Sharp) etc. are suggested for Obesity management as they possess *Medonashaka*, *Kaphanashaka* and *Sthaulyahara* actions .

The combination of ten *Lekhaniya* (Drugs having scrapping action) medicines described by *Acharya Charaka* can be used in the management of obesity.

Dose Duration & Method of Treatment¹¹

Pragbhakta i.e. intake of medicine before meals is insisted for *Krishikarana* (losing weight) purpose.

Among *Panchavidha Kashaya Kalpana* (Five pharmaceutical processes), *Kalka Kalpana* (Paste) is attributed to have *Karshana* (To reduce fat) and *Durjara* (Difficult to digest) properties and the same is advocated in the management of Obesity. The use of *Avishadkara*, *Mridu*, *Sukhakara Aushada* in gradually tapering dose with caution is advised for *sthaulya* management. Further it has been emphasized to consider *Agnibala* (Strength of the Digestive fire), *Dehabala*, *Doshabala* (Strength of the vitiated body humors) & *Vyadhibala* prior to fixation of dose and duration of treatment of Obesity.

- *Utpattihetu Parihaara*: – The factors which are responsible for *Sthaulya* are to be avoided.
- *Guru + Apatarpana Dravya Upayoga* : – The medicines as well as food should possess the properties *Guru* and *Apatarpana*. *Guru Dravya* helps in treating *Agni* while at the same time due to *Apatarpana* property it reduces excessive *Meda* (*Agnim Yaapayati, Medo Hanti*).
- The medicines, diet and all the measures which are *Vataghna*, *Kaphaghna* and *Medohara* should be used. *Basti* with drugs having *Teekshna* and *Rooksha* properties, *Lekhana Basti* and *Rooksha Udvartana* should be administered.
- Following *Vihaaras* should be adopted for *Sthaulya* treatment *Prajaagarana*,

Vyaayaama, *Vyavaaya*, *Chintaa*. All these *Vihaara* should be adopted and their intensity should be increased gradually.

- The drugs having *Virookshana* and *chedana* properties are indicated in *Sthaulya* treatment.^{10, 11, 12}

*Pathya*⁸

- *Rasa* – *Katu, Tikta, Kashaaya*
- *Guna* – *Rooksha*
- *Shooka* – *Yava, Puraana, Shaalee, Venu Yava, Koradoosha, Shyaamaaka, Neevaira*
- *Shaaka* – *Dagdha Vaartaaka Phala, Patrottha Shaaka*
- *Shimbee* – *Kulattha, Chanaka, Masoora, Mudga, Aadhakee,*
- *Maamsa* – *Chingata Matsya*
- *Dugdha* – *Takra*
- *Drava* – *Madya, Sarshapa Taila, Bibheetaka Taila*
- *Kritaanna* – *Bharitraka, Pippalyaadi Kashaaya Siddha Aahaara.*
- **Other** – *Triphalaa, Trikatu, Elaa, Madhu, Laaja, Guggulu, Loha Bhasma, Priyangu Choorna, Kshaara, Shilaajathu, Agaroo Lepa, Koshna Jala, Chinta, Shrama, Jaagarana, Maithuna, Udvartana, Langhana, Rechana, Vamana*

Apathya

- *Rasa* – *Madhura*
- *Guna* – *Sugandha*
- *Dhaanya* – *Godhuma, Nava Shaalee*
- *Shimbee* – *Maasha*
- *Maamsa* – *Matsya,*
- *Dugdha* – *Dugdha, Dugdjhanya Padaartha*

- **Phala – Ikshu**

Prevention^{13, 14, 15}

Prevention is defined as the art and science of health promotion, disease prevention, disability limitation and rehabilitation.

Levels of prevention

- Primordial: prevention of development of risk factors in countries or population group in which they have yet not appeared.
- Primary prevention: action taken prior to the onset of disease, which removes the possibility that a disease will ever occur.
- Secondary prevention: action which halts the progress of the disease at its incipient stage and prevents complications.
- Tertiary prevention: all measures available to reduce impairments and disabilities minimize suffering caused by existing departure from good health to promote patients adjustment to irremediable conditions. *kashaya rasa* and *ruksha* foods and drinks, consumption of more *shakavargadravya* (leafy vegetables), intake of food in proper quantity with all nutrients, drinking water before taking food, drinking *madhoodaka* (honey mixed with water) after food. Primary prevention in terms of *vihara* can be achieved by adopting physical exercises and brisk walk as a part of daily routine, undergoing *rutushodana* and *udvartanam*. Avoidance of *adhyasana* (taking food before digestion of previous food), avoidance of excessive consumption of *madhura rasa* food (carbohydrate and fats/energy dense food), not consuming food when tired, angry or worried, secondary prevention can be achieved by early diagnosis and early

treatment. Early diagnosis should be based on the signs and symptoms of *Sthaulya*. Early treatment consists of *pathyapathya* followed by *shamanoushadis* and yoga practice. *Pathya* consists of dravyas having the properties of *vata*, *kapha* and *medahara* like *yava* (*Hodium vulgare*), *ko-drava* (*Paspalum scrobolatum*), *mudga* (*Phaseolus radiatus*), *kulatha* (*Dolicus biflorus*), *patola* (*Trichosanthes cucumerine*), *shyamaka* (*Echinochloa frumentacea*), cabbage, carrot, bitter gourd, leafy vegetables and honey. Using *shamanaushadi's* which consists of *guduchi* (*Tinospora cardifolia*), *mustha* (*Cyperous rotundas*), *triphalala*, *vidanga* (*Embllica ribes*), *nagara* (*zingiber officinal*), *yavakshara* and preparations like *takrarishta*, *triphalala guggulu*, *amrutadya guggulu*, *navaka guggulu*, *vyoshadi guggulu* are beneficial. Practicing some of the yogic postures like *suryanamaskara*, *paschimotasana*, *bhujangasana*, *sarvangasana*, *katichakrasana*, *naukasana*, *halasana* are useful. *Panchakarma* procedures like *lekhana basti*, *ruksha kashaya bastis* are apt in secondary prevention of *Sthoulya*. One should avoid intake of food articles which aggravates *kapha* and *meda*. *Shodhana* modalities like *virechana*, *teekshna lekhaneeya bastis* along with proper diet and exercises will help in tertiary prevention of Obesity.

DISCUSSION¹⁴

Ahara and *viharatmaka nidanas* mentioned for *Sthoulya* causes aggravation of *kapha* and are responsible for *medovridhi*.^{15, 1} These factors are contributing to get obesity in persons who

have tendency to gain weight due to genetic predisposition (*beejadusti*)¹⁶. The concept of *santarpaka*^{16,17,18} (over nourishment) *ahara* and *vihara*, when viewed with contemporary medical science, then it can be interpreted that the components of the *nidan*s are nothing but, the high caloric foods and sedentary life styles. The life span of an obese person decreases proportionally with increase of BMI. As a result, there will be increased chances of developing complications like stroke, IHD. Hence prevention of *Sthaulya* is very much essential. Among the different levels of prevention mentioned nowadays in science, are all applicable in obesity. The primordial prevention of obesity aims at general education about the different aspects of the disease like causes, complications and prevention to the public. Since obesity is having its early origin from childhood, modifications in lifestyle like alterations in eating patterns, adopting physical exercises and prevention of addictions can be undertaken. Primary prevention is most useful in people having positive family history. This level of prevention can be adopted through controlled diet, regular physical exercises, avoiding sedentary lifestyle. The secondary prevention can be implemented to prevent the progressive stages of obesity after its manifestation. Regular exercise, diet control along with various treatment modalities are adopted which help in controlling, reducing the complications. Following purificatory therapies limit the impairments and minimize the disabilities. Thus these act as effective tertiary preventive methods.

CONCLUSION

Sthaulya is described as a pandemic since antiquity. It is a disorder of *santarpananidana* with the involvement of mainly *medodhatu* and *kaphapradhana tridosha*. The main line of treatment is *nidanaparivarjana* and *apatarpana*. *Apatarpana* regimen consists of dietary regulation, treatment modalities which decrease the fat from the body. Ayurvedic classics advocate preventive measures of obesity from early childhood itself.

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