

MENOPAUSE (RAJO NIVRUTTI) AND OBESITY (STHOULYA) - A CRITICAL REVIEW

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ABSTRACT

Obesity has reached epidemic proportions in the recent years. Modern lifestyle and dietary habits often take the blame for its rise. Obesity acts as a risk factor for many non-communicable diseases like diabetes mellitus, cardiovascular diseases, cancer, hypertension. Obesity is also outcome of many changes in the body. One of the causes of obesity in female population is menopause. Since menopause brings along with it a plethora of ailments, obesity is treated as any other lifestyle disorder. There is a need to study *Sthoulya* (obesity) through the aetiological factor mentioned by *Charaka* as *Javoparodha* or explained by *Chakrapani* as *Jaroparodha*- early onset of old age. There is an urgent need to treat obesity from the perspective of menopause. Menopause can occur at any age from 45-55 years. But the aftereffects of menopause may persist well into the age of 65-70 years. In the next decade there will be a rise in the geriatric population by 56% in the world. In India geriatric population will be 12.5% of the total population. According to the national census of 2011 in India, there are 53 million females in the elderly population compared to the male population of 51 million. The female geriatric population may have a completely different set of ailments compared to that of male geriatric population. Hence *Sthoulya* due to menopause should be considered a separate disease entity and the management should be that of hormonal rehabilitation than just replacement.

Keywords: Obesity, Menopause, Hormones, *Sthoulya*, *Rajo Nivrutti*, *Jaroparodha*

INTRODUCTION

In case of menopause, women who earlier did not fall into the category of obesity suddenly find themselves in this group. The lifestyle which seemed perfect till now seems to be the culprit. Menopause in itself brings about many other ailments in the form of menopausal syndrome. The classical texts determine the age of menopause around fifty years. *Sthoulya* (obesity) is considered one among the eight despicable personalities (*Ashta Nindita Purusha*) by *Charaka*. An analysis of these body types reveals that these body types are related to hyper or hypo secretion of endocrine glands and or due to deficiency of micronutrients. *Sthoulya* in general is considered to be due to lethargic lifestyle and due to genetic makeup. *Rajo Nirvrtti* (cessation of menstruation) is the main cause for obesity in menopausal stage. *Sthoulya* is related to increase in *Medo Dhatu* (adipose tissue) and *Rajo Nirvrtti* heralds the onset of *Vardhakya* (old age) associated with *Dhatu Kshaya*¹ (depletion of body tissues). The causes appear to contradict one another.

A comprehensive understanding of *Sthoulya* and *Rajo Nirvrtti* would shed light on the problem and treating menopausal obesity as a separate entity would make the management of *Rajo Nirvrtti Janya Sthoulya* (menopausal obesity) easy.

***Sthoulya* and *Rajo Nirvrtti*:**

The causes for *Sthoulya* enumerated by *Charaka* include excessive intake of food, intake of high calorie diet which is heavy for digestion, sweet in taste, cold and unctuous in nature; lack of physical exercise, abstinence from sexual intercourse, indulgence in day time sleep, excessive cheerfulness, lack of mental worry and genetic predisposal. The features of obesity according to *Charaka* include shortening of lifespan, difficulty in movements or sluggish movements (But interpreted as early onset of old age by *Chakrapani*), difficulty in sexual intercourse, general debility, foul smell from the body, excessive sweating, excessive hunger and excessive thirst². *Sushruta* explains that *Rasa dhatu* (chyle) is the sole cause for both *Sthoulya* and *Karshya* (emaciation). In a person who takes food that increases *Kapha* (*Kapha* humor), one who takes food before the previous meal is digested, one who does not indulge in

physical exercise, one who indulges in day time sleep, the incomplete *Annarasa* (undigested food) in *Ama* (product of incomplete digestion and metabolism) condition affects the body wherever it circulates with its sweet taste, and gives rise to *Meda* because of its unctuousness and causes excessive *Sthoulya*. The person thus affected will suffer from breathlessness, excessive thirst, excessive hunger, excessive sleep, excessive perspiration, excessive foul smell of the body, phlegm in the throat, general debility and unclear speech rapidly. *Medo Dhatu* (adipose tissue) *Vruddhi Lakshana* (features of excess) as enumerated by *Vagbhata* includes *Mamsa Vruddhi Lakshanas* (excess of muscular tissue) like goitre, malignant growth, tumours, excessive growth in thighs and abdomen, excess of mass in neck region. In addition, *Medo Dhatu* excess includes fatigue, breathlessness on exertion, sagging of hips, breasts and abdomen³.

The complications arising due to obesity enumerated by *Vagbhata* are *Apachi* (various types of tumours), *Meha* (Diabetes mellitus and other diseases of the urinary system), *Jwara* (fever), *Udara* (ascites), *Bhagandara* (fistula in ano), *Kasa* (cough), *Sanyasa* (coma), *Ama* condition (disorder of digestion and metabolism) difficult to treat and *Kushtha* (skin diseases)⁴. Among other causes of *Sthoulya*, *Rajo Nirvrtti* has to be taken as the main etiological factor. *Sushruta* and *Vagbhata* have mentioned the age of *Rajo Nirvrtti* as fifty years^{5,6}. *Charaka* states that the pathology of *Sthoulya* is *Vata* (*Vata* humor) getting fuelled by *Medodhatu* in increasing the *Agni* (digestive fire) of a person which again leads to over consumption of food. Therefore, the *Vata* predominance during the *Jara Kala* (old age) is more detrimental in the context of *Sthoulya* due to *Rajo Nirvrtti*. *Sushruta* as well as *Vagbhata* have mentioned that *Artava* is a form of *Rasa Dhatu* (blood and plasma tissue). *Sushruta* goes on to mention that *Artava* is *Agneya* (possessing fire element) in nature. So, the deficiency of *Agni Maha Bhuta* (fire element) brings about *Rajo Nirvrtti*.

Obesity in menopause and hormones:

The hormones related with satiety include steroid hormones which are sex hormones. They include

oestrogens (oestradiol, oestrone and oestriol), progesterone and testosterone. The adrenal hormones include DHEA (Dehydroepiandrosterone) and cortisol. Women tend to have fat stores in the form of subcutaneous fat around the hips and in the breasts. When there is rise in oestrogen levels, excessive fat deposition occurs primarily around the hips and thighs leading to the typical pear-shaped body which is gynoid obesity. In postmenopausal phase, the oestrogen levels become very low and testosterone levels continue to be produced by the ovaries and adrenals. At the level of tissue or cell, oestrogen rules over the testosterone before menopause. After menopause oestrogen / testosterone ratio shifts to testosterone dominance. This results in androgen excess. The fat distribution is androgynous in nature or apple shaped where the visceral fat is stored in the belly in the interstitial space. The fat tissue acts as an endocrine organ and consists of aromatase. This converts testosterone to oestradiol and androstenedione to oestrone. In obese women of postmenopausal phase, the predominant form of oestrogen is oestrone and not oestradiol. Oestrone is ten times less potent compared to oestradiol. Presence of oestrone and absence of oestradiol is the hallmark of menopause. DHEA is a precursor for the production of oestrogen and testosterone in tissues. Its concentration in the body is more compared to other steroid hormones. One of the natural metabolite of DHEA, 7-keto DHEA is known to increase the metabolic rate and helps in weight loss according to some studies. Progesterone balances and optimizes the effects of oestrogen. Increase in appetite and food intake may be caused by progesterone. Excess production of progesterone may increase insulin resistance which in turn promotes fat storage. In chronic stress condition, the effect of cortisol on blood sugar results in increased appetite and craving for carbohydrates. It also results in storage of more glucose as fat in the visceral area. This visceral fat has more cortisol receptors than other types of fat tissue. Thus, hormones affect weight gain which in turn affects hormone balance⁷. Oestrogens are transferred to adipose tissue cells and liver cells by endocrine and paracrine pathway. They are produced in these cells by androgens. Oestrogen receptors are present in adipocytes and hepatocytes in a lesser density

compared to that in gonads. On cellular level, oestrogens regulate mRNA (messenger ribonucleic acid) production for particular proteins which are involved in lipid metabolism. In adipose tissue, 17- beta oestradiol has a direct effect on lipo protein lipase (LPL) and hormone sensitive lipase (HSL). The indirect action of oestrogens on adipose tissue is connected with the stimulation of the releasing of other hormones which increase HSL activity. There are many which belong to this group of hormones including catecholamines, growth hormone and glucagon. In liver, 17- beta oestradiol regulates the synthesis of structural apolipoproteins for VLDL (very low-density lipoproteins) and HDL (high density lipoproteins). 17-beta oestradiol regulates lipid metabolism in adipocytes and hepatocytes and thus modulates the concentration of lipid substances in plasma. The lack of 17- beta oestradiol likely leads to various lipid metabolism disorders in women after menopause⁸.

Many studies have shown that oestrogenic signalling may be responsible for obesity in menopausal women. The chances of menopausal women developing obesity and metabolic abnormalities is three times more than premenopausal women. The hormones leptin, insulin, sex hormones and growth hormone influence appetite, metabolism and body fat distribution. The increased production of oestrogens in the fat of older women who are obese is associated with an increase in breast cancer risk. This indicates that the source of oestrogen production is important⁹. The accumulation of abdominal fat puts both men and women at a heightened risk of cardiovascular disease, diabetes and insulin resistance. Women are protected from these negative consequences as long as they carry their weight in their hips and saddle bags. But when they go through menopause and the body fat shifts to the abdomen, they have to start battling all of these medical complications¹⁰.

Menopause occurs as a result of a genetically programmed loss of ovarian follicles. The earliest stage of menopause, typically around two years prior to the onset of menstrual irregularity, begins when inhibin B concentrations fall due to a decreased number of follicles, which causes serum follicle stimulating hormone (FSH) levels to rise. During this transition, oestradiol

secretion is relatively preserved (normal or high oestradiol levels) due to an increase in aromatase activity. As menopause progresses, serum concentration of FSH and oestradiol change dramatically, high FSH and low oestradiol levels occur as a result of decreased aromatase and inhibin B activity which may be initiated by the hypothalamus and result in the clinical manifestation of menopause¹¹. The oestrogen levels of a woman are inversely proportional to her weight in menopause. A four-year study of newly menopausal healthy women showed increase in terms of adipose tissue. There was decrease in oestradiol. In vitro study of female mice surgically thrust into menopause by removal of ovaries was conducted. The study showed that oestrogen treated mice maintained constant weight. Those mice which were deprived of oestrogen rapidly gained weight. Studies have shown that oestrogen incorporates crucial elements into the DNA responsible for weight control. The absence of oestrogen and the crucial elements leads to progressive obesity¹².

DISCUSSION

Charaka mentions that *Vata* is fuelled by the *Medo Dhatu* and increases the *Agni* leading to increased appetite and more intake of food. Stored adipose tissue acts as an endocrine gland which may have receptor cells for hormones like cortisol. Leptin is one more hormone which increases appetite. According to the *Tridosha* (three humors) theory *Vridhastha* (old age) has predominance of *Vata*. *Sthoulya* is a disease of *Kapha Dosha* and *Medo Dushya* (adipose tissue that undergoes vitiation). So, the management of *Sthoulya* during *Rajo Nirvrtti* has to be simple. But in this case, there is involvement of hormones like oestrogen, testosterone. Because of the cessation of oestrogen there is an increase in the adipose tissue especially around abdomen and hips. Hence a comprehensive understanding of menopause and the physiological change it brings about in the body is necessary to understand menopausal obesity. The term *Javoparodha* carries relevance. As elaborated by *Chakrapani*, *Jaroparodha* as early onset of old age can be correlated with the onset of menopause. The deposition of adipose tissue in areas like buttocks, abdomen and breasts has been

mentioned. According to modern studies only the androgynous type of obesity is wrought with risk of other non-communicable diseases. Focus on fat metabolism is needed as *Sthoulya* is considered a *Medo Roga* (disease of adipose tissue) which involves *Medo Dhatu*¹³. In many texts, *Javoparodha* has been explained as difficulty in movements or sluggish movements¹⁴. There is opinion that *Medo Dhatu* in excess may cause depletion of next *Dhatu*s (tissue or system) like *Asthi* (bone), *Majja* (bone marrow) and *Shukra* (semen)¹⁵. *Medo Dhatu* has predominance of *Prithvi* (element of earth) and *Ap Mahabhuta* (element of water) and is similar to *Kapha Dosha* (*Kapha* humor)¹⁶. According to some researchers, *Baddha Meda* (fixed fat) is referred to as fat deposition in certain areas like hips, buttocks and abdomen. *Abaddha Medas* is the fat circulation in the form of lipids like cholesterol, triglycerides, HDL (high density lipoproteins), LDL (low density lipoproteins), VLDL (very low-density lipoproteins)¹⁷. *Sushruta* explains that menstrual blood is the manifestation of *Rasa Dhatu*. But *Rajo Nirvrtti* is brought about by the depletion of all the *Dhatu*s due to old age¹⁸. *Sushruta* describes the nature of *Artava* (menstrual blood) as *Agneya* (possessing the nature of fire)¹⁹. Though there is depletion of all the other *Dhatu*s, due to old age there will be no manifestation of *Artava*. Since *Artava* is *Agneya* (possessing element of fire) in nature there will be depletion of *Agni Guna* (properties of fire element) in the body. This may cause increase of *Kapha* and in turn may increase *Medo Dhatu*. As a result, in spite of depletion of all the *Dhatu*s there will be *Medo Dhatu Vardhana Gunas* (factors which increase adipose tissue).

While explaining the management of *Sthoulya*, *Vagbhata* says that there is no medicine for *Sthoulya*²⁰ which underlines the difficulty in treatment. While explaining the general line of treatment *Vagbhata* says whatever is detrimental to *Meda*, *Vata* and *Kapha* has to be followed²¹.

Because of the obstruction to the path of *Kapha* and *Meda*, other *Dhatu*s will not be nourished. *Dalhana* explains that other *Dhatu*s refer to bones which may suggest osteoporosis and weakness of skeletal system, decreased *Shukra* may refer to low sexual drive. So, the

life expectancy decreases, the person may suffer from diabetic carbuncles, fever, fistula in ano, abscesses, cerebro vascular accidents and finally dies. All the complications occur due to the blockage of channels. Therefore, the aetiological factors need to be reversed²². The line of treatment should incorporate medicines and diet which have *Agni Mahabhuta*. They should be *Medo Hara* (alleviates adipose tissue) and *Kapha Hara* (alleviates *Kapha* vitiation) in action. Since menopause results in the depletion of *Asthi* (bone) and *Majja Dhatus* (bone marrow), diet and life-style modifications are to be advised for supplementing these *Dhatus*. Stress related weight gain can be treated by finding and reducing sources of stress. Relaxation techniques reduce the harmful effects of stress on the body. As stress decreases, cortisol is brought down. There is decreased appetite, insulin resistance is brought down and as a result fat storage decrease.

CONCLUSION

Sthoulya alone is difficult to treat and menopausal obesity more so because of many physiological changes in the body due to hormonal variations. The body has depletion of all other tissues except muscular and adipose tissue. Hence the management of *Sthoulya* of *Rajo Nirvrtti* should take care of the *Agni*, *Vata* and *Kapha Dosh* as well as *Medo Dhatu*. Hence a comprehensive diet plan which consists of *Agni Guna* which increases *Agni* and alleviates *Kapha*, *Vata* and *Meda* needs to be planned. Daily regimen of exercise, proper sleep and a disciplined routine are helpful in menopausal obesity. Procedures like *Sarvanga Udwartana* (whole body massage with medicinal dry powder) and *Bashpa Sweda* (sudation in steam chamber) may reduce subcutaneous fat. *Lekhana Basti* (medicated enema) may help in reducing visceral fat and *Tikta Dravya Basti* (enema consisting of bitter ingredients) may help in increasing bone density (*Asthi Vriddhi*). Use of *Kshudra Dhanyas* (millets) which contain soluble fibre helps in reducing cholesterol and triglycerides.

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