

AN AYURVEDIC APPROACH TOWARDS POSTMENOPAUSAL OSTEOPOROSIS - A REVIEW

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ABSTRACT

India is the second largest country in the world regarding population. As the life expectancy has increased, the population of postmenopausal women is also increased. Hence the problems associated with increasing age are increased. The studies of last two decades suggest that women in menopausal age report more physiological and psychological problems. Osteoporosis is one among them. Osteoporosis or porous bone is a worldwide problem, characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and an increased risk of fractures. In modern science treatment available for menopausal symptoms is mainly symptomatic and has some adverse effects too. In *Ayurveda* we cannot find the name of this disease, but signs and symptoms of *Asthi-Kshaya* are found quite similar to osteoporosis. The function of *dhatu* is *dharana* (To maintain the structure) of the body. Among all *dhatu*s, *asthidhatu* is responsible for maintenance of structural framework of the body. It shapes the body and protects the vital organs. *Acharya Charaka* in *Sutra Sthan* has explained the concept of osteoporosis. Aggravation of *Vata* is a main cause of *Asthi-Kshaya* and so it is mentioned as a *Vata* related disorder in *Samhitas*. Principle of treatment mentioned in *Charak Samhita* is as, “*Samanagunabhyaso Hi Dhatunaam Vruddhi Karanam*”. According to it, things, which contain similar properties to a particular *Dhatu* of body, can be helpful to increase that one *Dhatu*. So *Vatashamak* medicines, diet, exercise having similar properties to *Asthi Dhatu*, *Panchakarma*, *Rasayana* can be very effective to promote bone cells in body. This study is an attempt to understand *Nidana panchaka* of this disease, and its holistic management in context of *Ayurveda*.

Keywords: Menopause, Rajonivrutti, Osteoporosis, Asthikshaya

INTRODUCTION

In the era of information & technology, women are dynamic and having a multi-dimensional attitude. But Indian woman still has a tendency to ignore her health issues. While looking after the family, her own health is always compromised. Though Menopause is a natural and inevitable event as a part of the normal process of aging, it is becoming a major health issue in recent years, in developed as well as developing countries like India. It is a more complex phase of old age in women than men. Women in this age group have special needs. However, the public healthcare system does not acknowledge the special needs of women. The unpleasant change experienced by women during this phase is termed as menopausal syndrome which is characterized by psychosomatic disturbances. Hormone replacement therapy (HRT) is the conventional treatment being practiced for it; however, HRT is associated with many side effects. In postmenopausal women, tendency to fall into osteoporosis is very high due to hormonal insufficiencies. Women ≥ 50 years of age have a four times higher rate of osteoporosis and a two times higher rate of osteopenia, and they tend to have fractures 5 - 10 years earlier compared with men. ^[1]

Though different treatment modalities like HRT, Calcium & Vit-D supplements are commonly used, there is no treatment which has satisfactory improvement without side effects. Due to some adverse effects and lacunae of synthetic drugs, there is a need of finding out better remedy for the management of osteoporosis. *Ayurveda* seems to be effective in addressing the above-mentioned limitations of the conventional therapies.

Postmenopausal Osteoporosis- It is the second most common metabolic bone disease in India. ^[2] In osteoporosis, the bone mineral density (BMD) is reduced, bone microarchitecture deteriorates, and the amount and variety of proteins in bone are altered.

World Health Organization defines Osteoporosis as "Progressive systemic skeletal disease characterized by low bone mass and micro architectural deterioration of bone tissue, with a consequent increase in bone fragility

and susceptibility to fracture". ^[3] Not only does it give rise to morbidity but also markedly diminishes the quality of life of women after menopause. ^[4] It is called a silent disease because it can develop gradually over many years without causing any symptoms.

As per modern medicines there are two factors which are important in the disease osteoporosis, first is peak bone mass and second is the process of remodeling. It is a constant phenomenon which is always happening in the bone. When the bone resorption supersedes bone formation then the bone becomes weak and the chances of osteoporosis increase. Bone remodeling is the primary function of osteoblasts (responsible for bone formation) and osteoclasts (responsible for bone resorption), while other hormones (esp. estrogen), growth factors, along with cytokines, play a regulatory role in maintaining bone homeostasis. ^[5-8]

Menopause is a natural, hormone (estrogen) deficient state that occurs at the age of 45-55 years. In menopause estrogen gradually decreases which causes increase in bone reabsorption and decrease in the deposition of new bone that normally takes place in weight-bearing bones which leads to accelerated bone loss. ^[9] Acute ovarian estrogen deficiency (due to the increased osteoclast activity) leads to the depletion of calcium, collagen and proteins from bone, with the resultant increase in bone porosity. ^[10-11] Bone resorption increases by 90%, whereas bone formation increases by only 45%. This imbalance in bone resorption and remodeling leads to accelerated bone loss. ^[12]

Some studies have shown the influence of estrogens on bone mass in premenopausal state. There is positive association between bone mass and parity in premenopausal women as per some studies. Some studies have stated the association of oral contraceptive use with higher bone mass in some women. A number of hypoestrogenic states in premenopausal women are associated with reduced bone mass. Amenorrhea in female athletes and ballet dancers is associated with low bone mass and fracture risk ^[13] indicates the presence of osteoporosis. ^[14] Standard therapies include anti-

resorptive drugs that decrease bone loss, e.g., bisphosphonates, calcitonin, selective estrogen receptor modulators, calcium and anabolic agents that increase bone formation. [15]

Rajonivrutti (Menopause) and Asthikshaya (Osteoporosis) -

Ayurveda links menopause with aging, i.e., *Jarawastha* of body. [16] As age advances natural declining in quality and quantity of all *Dhatu* (*Kshaya*) occurs by the result of increased *Vata*. *Bhava Prakasha* has described 80 types of *Vata rogas* and *Rajonasaas* (loss of menstruation) is one among them. [17]

Ayurveda has emphasized on *Samata* and *Vishamata* of *dhatu* while mentioning the definition of health as well as disease. [18] State of equilibrium of all *dhatu*s is health and *Vaishyam* i.e. disturbance in this equilibrium is called disease. So, any of increase (*Vruddhi*) or decrease (*Kshaya*) in *dhatu* can be a disease condition. *Asthi kshaya* is a condition in which there is *kshaya* (degeneration) of *Asthi dhatu*. *Asthi kshaya* may be co-related to osteopenia/osteoporosis where there is a decrease in the bone tissue.

Asthidhatu is supposed to be seat of *vata*. Both of these are having *asharaya-Asharayee Bhav* relationship between them. Any causative factor which aggravates *vata* causes harmful effect on *Asthidhatu*. For all types of *kshayas Charak* has explained common causative factors which can be considered as causative factors for *Asthi kshaya* also. [19] It is clear from above mentioned reasons that in treating *Asthikshaya*, *vata* aggravation is to be corrected.

Nidan (Etiology)

The etiological factors for *Asthikshaya* are not found separately in the *samhitas*. We need to understand the etiological factors for *Asthikshaya* on the principles of *ashrayashrayi* Bhavas.

1) Sahaja Hetu (Genetical cause)

a) Vitiation of *Beeja* (eggs or sperms), *Beejabhaga* (genes), *Beejabhagavayava*: It may be considered as a causative factor for weakness in *Asthi Dhatu* in the offspring. [20,21]

b) *Pitrija Bhava*: in *Garbhavkranti* it is mentioned that *Pitrija Bhava* is responsible for formation of *Asthi*

Dhatu. Therefore, any abnormality in *Pitrija Bhava* can be a cause of improper *Asthi Dhatu* formation. [22]

2) Jataja Hetu (Congenital cause) [23,24]

Asthidhatu is supposed to be seat of *Vatadosha*. Both of these are having *Asharaya-Asharayee Bhava* relationship between them. So, factors aggravating *Vata* affects *Asthi dhatu* and, which lead to imbalance of *Asthi Dhatu* proportion in body. [25]

a) Intrauterine life- if pregnant lady doesn't follow the *Garbhini Paricharya* (do's and don'ts in pregnancy), if she consumes excessive *Vata* aggravating food, then *Asthidhatu* of her offspring may get affected, causing *Asthivikruti*. [26]

b) Factors causing aggravation of *vata*-

i) Excessive intake of food having *Ruksha Laghu, Sheeta, Vishad, Chala Guna; Katu, Tikta, Kashya Rasa*; less intake of *Snigdha, Guru Guna Ahara*; and *Ksheera Dravya* like *Ksheera, Ghrita*.

ii) Faulty dietary habits like - *Langhana -Anashan-Alpashana* (frequent fasting and inadequate food intake), *Ativyayama* (Excessive exercise), *Ativicheshta* (exertion), *Avyayama* (Sedentary life style), *Divasvapna* (sleeping in daytime), *Dukhshaiyasana* (discomfort bed), *Sheeghrayana* (excessive travelling), *Atiprajagaraṇa* (inadequate night sleep), *Patana- Abhighata* (Injuries leading to fracture), *Chinta* (worries), *Shoka* (agony), *Krodha* (anger), *Bhaya* (fear), etc.

Strotodushti-There are two causes for vitiation of *Asthivaha Srotas*; one is excessive exercise causing friction and inflammation of bones and second one is intake of food that aggravates *Vata*. [27]

3) Swabhavaja Hetu: Generally, women have genetically low bone mass than men. So postmenopausal osteoporosis is peculiar in women. In Ayurvedic texts too, references regarding to this are given at various places. *Acharyas* have mentioned some special characteristics of women contrary to men, which are considered under *Streekara Bhava*. [28,29]

a) *Samhanana*: *Samhanan* is proper distribution of *asthi* (quality and quantity wise). It is examined by qualitative and quantitative wise proper distribution of *asthi dhatu*. Hence *asamhanana* is related to *asthi dhatu* that is weaker in female as compared to male. [30]

b) *Shaithlya* indicates laxity of joints and other body parts.

c) *Mardava* denotes softness of all body parts.

d) *Acharya Kashyapa* has described the characteristics of *danta* (teeth) in male and female while explaining dentition. Dentition in girls is less painful than boys as their teeth are *mridu* and *sushira* in constitution by nature.

All these facts show that *Asthi Dhatu* is naturally weak in women as compared to men. Therefore, in women after *Rajonivritti*, where *kshaya* of all *Dhatu*s becomes fast, *Asthi Dhatu* is markedly affected because of already having weak constitution.

4) *Kaalaj*: During *Jaravastha* aggravation of *Vata* and natural decline in quantity and quality of all *dhatu*s occur which leads to degeneration in bones.

Probable Etio-Pathogenesis (*Samprapti*) of the Postmenopausal Osteoporosis:

Samprapti of *asthikshaya* has not been explained directly anywhere in Ayurvedic *samhitas*. Considering all the etiological factors explained under *vatavyadhi*, *asthikshaya* pathogenesis can be explained in following way.

Etiological Factors:

Dosha: Rajonivritti-Janya Asthi- Kshaya is a disease occurring in aging phase *Vata Dosha* is a main cause for its occurrence. Simultaneously *Kshaya* of *Kapha* occurs along with it.

Dushya: This is the disease of *Asthidhatu* and its *Mala-Nakha* and *Kesha*. Among all of these main *dushya Asthidhatu* it is most affected.

Strotas: Asthivaha Strotas get affected. So nutritive factors are not supplied to *Asthi Dhatu* through *Asthi Vaha Strotas*.

Agni: In the pathogenesis of *Asthi Kshaya* all three *agni*, i.e. *Jatharagni*, *Bhutagni* and *Dhatwagni* are responsible.

The vitiation of *Jatharagni* leads to improper digestion of the food resulting in the production of *Ama rasa*, which contains very less nutrients or may totally be devoid of nutrients leading to improper nourishment of the *Asthi* resulting in *Asthi kshaya*.

In *Jaravastha*, vitiated *Jatharagni* also affects both *Dhatwagni* and *Bhootagni* which leads to improper formation of *Asthidhatu*.

Manasik Avastha: The involvement of the psyche can also be considered in the etiopathogenesis of this disease, because body and mind have close association with each other. *Charaka* opines that the *Sharirika Roga* (somatic diseases) and *Manasika roga* (psychic diseases) have inter-relationship. [31]

Samprapti: Vitiation of *vata* is the main factor responsible for *Asthi kshaya*. More intake of *Vataja Ahara-Vihara* and less consumption of *Snigdha Prakriti Ahara* especially by menopausal women cause aggravation of *Vata*. This leads to provocation of *vata* and this vitiated *vata* fills in the channels which are devoid of unctuousness and vitiate them further leading to the stronger provocation of its own. The factors which have considered under *Swabhavaja Nidana* as *Streekara Bhava- Asamhanana* together with *Sahaja Nidana* i.e. *Beeja Dushṭi* and *Pitrija Bhava Dushti* cause vitiation of *Asthi dhatu*.

Proper functioning of *jatharagni*, *bhutagni* and *dhatwagni* is essential for proper nourishment of *dhatu* which ultimately maintains quality and quantity of *Dhatu*. When the functioning of *jatharagni* becomes improper, *Aam* (indigestion) is formed, which can further cause *strotorodh* (obstruction in channels) leads to improper nourishment of *asthi* resulting in *asthikshaya*. Improper functioning of *Dhatwagni* leads to the deformity in the transformation of *dhatuposhakanshu* (*Dhatu* specific nutrients) into *sthayi dhatu*, resulting in *dhatu vikriti*. As *asthi* is composed of *parthiv*, *tejas* and *vayu mahabhuta*. Any functional deficit in any of these *bhutagni* lead to nutritional deficit resulting in *asthikshaya*.

Sign & Symptoms (*Rupa*)

In the initial stage, Osteoporosis is totally asymptomatic as low bone mass itself doesn't cause any symptoms and so it is called as the "silent thief".

The main symptoms of *Asthikshaya* described in different *samhita* are *asthibheda* (fractures), *asthishula* (pain). Generally, when *dhatu* is affected its *upadhatu* and *mala* is also affected; hence the symptoms like *kesha vikara* (disorders of hair), *nakha vikara*

(disorders of nails), *smashru vikara* (disorders of moustache) *danta vikara* and *paata* (disorders of teeth) *sandhi shaithilya* (pain in joints), *rukshata* (dryness) are also seen in *Asthi kshaya*.

Management

Ayurveda treatment visualizes the human body as a single unit and the approach of the treatment has been always holistic. The treatment of *asthi kshaya* includes *ni-dana parivarjana* (Avoidance of etiological factors), *shodhana* (Bio purification), *shamana* (Palliative treatment), *rasayana* (Rejuvenation), *pathyapathya* (Proper diet).

1. *Nidana Parivarjana* (Avoidance of etiological factors):

Primary principle in *Ayurveda* is to avoid the causative factors. The individual suffering from *Asthi kshaya* must avoid excessive indulgence in etiological factors responsible for vitiation of *Vata*, vitiation of *Asthi vaha strotas*.

2. *Shodhana Chikitsa* (Biopurification):

It is indicated in *bahudoshaavastha*. *Vagbhata* had mentioned this in *asthi kshayachikitsa*.^[32] *Acharya charak* has given the similar line of treatment for *asthi pradoshaja vikara* which includes *panchakarma*, especially *basti* which contains *kshira*, *ghrita* and *tikta dravya*.^[33]

3. *Shamana Chikitsa* (Palliative Treatment): The main aim of *Ayurvedic* therapy in *asthi gatvata* includes *vatashamak* (*asthi* is the seat of *vata*), *Tarpak* and *Brihman* treatment. *Acharya Sushruta* has described the *Chikitsa Sutra* of *Asthi kshaya* along with the *Chikitsa* of all 18 types of *kshaya*. The *dravya* which are of *Swayoni* i.e. similar to the respective *dhatu* are to be used for the treatment of the respective *dhatu kshaya*.^[34] Here, in *Asthi kshaya*, *dravya* similar to *Asthi dhatu* should be used. This is based on the *Samanya Sid-dhanta*. Use of *Taruna Asthi* increases the *Asthi dhatu*.^[35] Use of *Asthi* in its transformations i.e. *Bhasma* (ash) will also increase *Asthi dhatu*. Keeping this principle in mind many preparations are used in *Ayurveda* Preparations like *Ajasthi bhasma*, *Kurma prishthasthi bhasma*, *Mrigashringa Asthi bhasma*, *Asthi bhasma* of other animals etc.

4. *Rasayana*: *Rasayana* is a boon for menopausal women and proves very good effects on female in menopausal period. *Rasayan* drugs like *Shatavari*, *Vidari*, and *Kumari* reduce fatigue and vaginal dryness. For psychological symptoms, like irritability, anxiety, or depression, there are very effective drugs like *Brahmi*, *Jyotishmati*, *Shankhapushpi* can be given.

Osteoporosis is the disease of *Jaravastha*. *Jara* is classified under *Svabhavaja Vyadhi* which becomes *Yapya* by *Rasayana* treatment. Hence for preventing *Asthi Kshaya*, *dravya* that is *Tikta* in *Rasa*, *Snigdha* in *Guna* *Rasayana Prabhava* and possessing should be selected. Some commonly used *rasayan* drugs are *Dwitiya Brahma Rasayana*, *Tritiya Triphala Rasayana*, *Chathurtha Triphala Rasayana*, *Chyavanaprasha Rasayana*, *Shatavari Rasayana*, *Shilajatu Rasayana* etc.

Role of Basti- in *Ayurveda Basti* treatment is considered as a prime treatment modality.^[36] Lipid soluble drugs are absorbed by passive diffusion and some of the active ingredient are absorbed through active transport. The bioavailability of the drugs is higher when given as *Basti*. Modern medical science also suggests some of the nutrient enemas meant for the nutrition of the body, where absorption of carbohydrate, fat and protein is mentioned.^[37]

Some popular oil preparations can be effective are *Kshirabala Taila*, *Chandanabala Lakshadi Taila*, *Dhanvantara Taila*, *Balaguduchyadi Taila*, *Balashwagandhadi Taila*, *Lakshadi Taila*, *Mahalakshadi Taila*.

CONCLUSION

Menopause is a phase characterized by a cluster of physical and psychological changes. The Postmenopausal period is associated with significant incidences of age-related medical conditions like cardiovascular diseases, fractures and osteoporosis. Osteoporosis can be covered under *Asthi kshaya*. Pathogenesis of *Asthi kshaya* is a complex mechanism and hence no single drug is advisable to reverse the pathogenesis. It requires a 'Holistic approach' to manage *Asthi kshaya* effectively. Early diagnosis, prevention and intervention should be the protocol to treat the disease. Treatment should be planned considering all the factors like *Dosha*, *Dushya*, *Kala*, *Bala*, *Agni* etc. of the patients.

Thus, *Ayurveda* can play a major role to treat osteoporosis.

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