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CONCEPTUAL OVERVIEW ON ASTHIKSHAYA AND IT'S MANAGEMENT W.S.R. TO POSTMENOPAUSAL OSTEOPOROSIS

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ABSTARCT

World Health Organization defines osteoporosis as a "Progressive systemic skeletal disease characterized by low bone mass and micro architectural deterioration of bone tissue, with a consequentincrease in bone fragility and susceptibility to fracture" Osteoporosis is considered a serious public health concern. The state of equilibrium of *Dosha, Dhatus, Malas* is health and its disequilibrium is known as disease. This disequilibrium may either be *Vriddhi or Kshaya. Asthis* the fifth *Dhatu* among the seven *Dhatus*. It is the seat of *vatadosha* and carrying the function of *dehadharana. Asthikshaya* is one of the condition described by *Acharya Charak* under 18 types *Kshaya* in which there is *kshaya* of *Asthi Dhatu*. According to the principle of *Ashraya-ashrayee Bhava, Asthi & Vata* are inversely proportional to each other regarding *Vriddhi* and *Kshaya. Vriddhvata* leads to *Kshaya of Asthi Dhatu. Menopause is inevitable, ayurveda describes as Rajonivrutti and it is a Part of aging Process. there is Anuloma Kshaya where Ras, Rakta, mamsa, meda, Asthi, Majja and shukra dhatu start depleting, Asthikshaya is based on bringing Homeostasis of Vata, Pitta and Kapha doshas.*

KEYWORDS: *Asthikshaya,* Postmenopausal Osteoporosis, *Rajonivrutti, Vata Dosha.*

INTRODUCTION

Ayurveda is an ancient science of life deals with the preventive as well as curative aspect. It explains humanbody as a 'congenial homeostasis' of *Doṣha, Dhatu* and*Mala*. The function of *Dhatu is Dharana* of the *Sharira*.

Osteoporosis is one of the major signs that has increasingly been perceived as serious disabling disease in women aged above 40 years reaching *Rajonivritti*. It is not mentioned as disease in classical texts of *Ayurveda.* Yet, according to *Acharya Sushruta* it can be considered under *Swabhavabala Pravritta Vyadhi*.[2] *Rajonivritti* occurs at *Sandhikala* of *Praudhawastha* and *Jarawastha*, where *Vata* starts overpowering *Pitta Dosha* and leads to *Kshaya* of all *Dhatus*.

According to the principles of *Ashrayaashrayi Bhava* by *Acharya Vagbhata, Asthi Dhatu* is the seat of *Vata Dosha* and is inversely related to each other i.e., if there is *Vata Vruddhi* there is *Asthikshaya*.[1] 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 Low levels of Estrogen cause imbalance in bone reabsorption and remodeling which leads to accelerated bone loss[2]

Menopausal osteoporosis is emerging as one of the major communal health problems. Menopause known as Rajonivrutti; is related to ageing process in Ayurveda Dhatukshaya occurs because of ageing. Artav which is upadhatu of Rasa dhatu starts declining in consequence to the decline of Rasa dhatu.[3] The function of reproductive organs and secondary sex charachters also tapers down.50 years is mentioned as Rajonivrutti Kala is mentioned by almost all Acharyas. Natural menopause has been defined by World Health Organization (WHO) as at least 12 consecutive months of amenorrhea not due to surgery or any other cause. The mean age at natural menopause (ANM) is 51 years in industrialized nations, while it is 48 years in poor and non-industrialized nations. Reduced production of estradiol, the most active form of estrogen as well as increased levels of follicle- stimulating hormone (FSH) and decreased levels of inhibin are observed in menopause.[4] Most women experience near complete loss of production of estrogen by their midfifties.

AIMS AND OBJECTIVES

1. Study the *Asthikshaya* and Osteoporosis in *Ayurvedic* and modern perspective.
2. Study the management of *Asthikshaya* in light of *Ayurveda.*

MATERIALS AND METHOD

asthi dhatu guna and karma

Asthi is a *Pitruja Avayava* (paternal tissue). *Guru* (heavy), *Khara* (rough) *Kathina* (hard), *Sthula* (bulkiness), *Sthira* (stable) and *Murtimandare* the *Gunas* of *Asthi Dhatu*. Its function is *Dehadharana* (supports the body and gives perfect shape to the body), *Majjapushti* (acts as reservoir of *Majjadhatu*) and it is the seat of vata.[5]

The Etiological Factors For Asthikshaya

The etiological Factors of Asthikshaya are not explained separately in the text. On the basis of Ayurvedic principle of Ashrayashrayee Bhava, The increase or decrease of Asthi and Vata are inversely proportional to each other. Hence the factors vitiating Vata will cause decrease in Asthi Dhatu. Acharya Charak had explained Samanya Nidana (general etiological factors) leading to the Kshaya of 18 types which includes mostly the Vataprakopak Nidana.[6]

Rajonivruttijanya Asthikshaya

In Ayurveda, menopause is depicted as *Jarapakwaavastha* manifesting into *rajonivrutti*. Ageing is associated with *anuloma dhatu kshaya*(degenerative changes) in the body. In *Jaravastha* (Ageing); *Vatadosha* is dominant.[7] Predominance of *vata* manifests into symptoms like *nidranash* (insomnia), *Chinta* (anxiety), urinary symptoms, *rukshata* (dryness of vagina) and *asthikshaya* (osteoporotic changes). Symptoms like hot flushes *(sarvangdaha* and *swedadhikya), Krodha* (anger) and irritability are due to *Pitta* predominance. As said earlier; Vata is a predominant dosha in ageing process. *Asthi* is *adhishthan* of *Vata.* When *Vata* increases, there is *kshaya* of *asthi*. As ageing process, gradually muscles become flaccid, joints lose their hold, ,bones are devoid of reticular tissue, reproductive tissue declines and ojas starts depleting. *Vatavruddhi* leads to *Asthikshaya* and *Asthisaushirya*. *Asthikshaya* is "decrease in the bone tissue" and *Asthisaushirya* means "porous bones". *Acharya Hemadri* explains *"Saushirya*" as "*Sarandhratvam*" which means "with pores". Osteoporosis means the decline in the bone tissue.[7]

Osteoporosis

The remodelling of bone is a continuous process throughout the life, for many years after closure of the epiphyses, skeletal mass remains constant and the rates of bone formation and resorption are approximately equal. In Osteoporosis the rate of bone resorption accelerates that of bone formation.

Women are more prone to Osteoporosis than men. The bone loss starts from the age of 30–40 years in both men and women. In women, menopause is followed by an immediate decrease in bone mass and density within a year. This increased rate of bone loss reaches Generalized osteoporosis may be primary or secondary. Primary Osteoporosis is often due to aging and natural menopause in women. Thus due to age-related bone loss in addition to menopausal bone loss women suffer more from Osteoporosis.

Osteoporosis caused or worsened by other disorders or medication exposures is referred as 'Secondary Osteoporosis'. Bone mineral density (BMD) is the most important tool for the diagnosis of osteoporosis. The gold standard for measuring BMD is the dual-energy X-ray absorptiometry (DEXA) densitometer, a specialized X-ray device that precisely quantifies BMD at the spine, femur,and other skeletal site. Therefore, screening ofwomen post age of forty must be encouraged.[8]

DIAGNOSIS AS PER MODERN MEDICINE

bone densitometry: It is indicated in

1) premenopausal women with long term steroid therapy, Primary or secondary amenorrhea, post oophorectomy, organ transplantation.

2) post-menopausal women who are not on estrogen therapy, vertebral or hip fractures and

3) men with unexplained fractures, hypogonadism and history of recurrent falls.

postmenopausal osteoporosis mechanism of estrogen effects on bone

An influence of estrogens on bone mass prior to the menopause was suggested by number of observations in reproductive state. Some studies have shown positive association between bone mass and parity in premenopausal women.[19] Also, oral contraceptive use has been associated with higher bone mass in some women, but not in all studies. A number of hypo-estrogenic states in premenopausal women are associated with reduced bone mass. Amenorrhoea in female athletes and ballet dancers is associated with low bone mass and fracture risk. The mechanism of action of estrogen on bone turnover still remains unknown. Yet, a number of hypotheses have been suggested. Estrogen induced effects on skeleton may be exerted via either genomic or non-genomic actions.

Calcitonin Theory: This theory proposes that estrogen deficiency is associated with reduced calcitonin production, leading to increased bone resorption, increased serum calcium levels, reduced parathyroid hormone secretion and hence reduced production of 1,25 dihydroxy

vitamin D3; this chain of events would result in reduced intestinal calcium absorption and reduced serum calcium levels.

Other theory proposes indirect effect of estrogen on bone resorption including reduced production of end organ resistance to 1,25-dihydroxyvitamin D3, resulting in decreased calcium absorption from intestine, increased parathyroid hormone secretion and increased bone turnover.[21]

Estrogen receptors theory: There are two main subtypes of estrogen receptor ER- namely ERα and Erβ. Both receptor subtypes have been reported in human bone. Recent evidence suggests that ERα is predominant in cortical bone whereas ERβ is the main form in cancellous bone. Estrogen receptors have been described on all the main cell types of bone, namely, osteoclasts, osteoblasts and osteocytes. Estrogen has effects on the production of a number of cytokines and growth factors, which are involved in the regulation of bone remodelling. The bone preserving effect of estrogen is mediated largely through its effect on osteoclast number and activity. In postmenopausal women, estrogen deficiency is associated with increased production of interleukin 1 (IL-1), tumour necrosis factor α (TNFα) and granulocyte macrophage colony stimulating factor (GMCSF), cytokines that increase osteoclast genesis and IL-1 and TNFα also increase osteoclastic activity. Estrogen also inhibits the production of interleukin -6 (IL-6), and more recently, has been shown to stimulate the production of osteoprotegerin in osteoblastic cells. Osteoprotegerin functions as a soluble decoy receptor for the cytokine RANKL (receptor activator of NFκB ligand), which is essential for osteoclast genesis. Effects of estrogen on osteoclast activity are also mediated via stimulation of apoptosis. IL-1, IL-6 and M-CSF have all shown to inhibit apoptosis in osteoclasts, whereas transforming menopause results in accelerated bone loss and is a major pathogenic factor in postmenopausal osteoporosis.[9]

Samprapti Ghataka of Asthikshaya

***Dosha*:** *Vata Pradhana* (*Vyana, Udana, Samana*), *Pitta* (*Pachaka*), *Kapha* (*Kledaka, Shleshaka*) *Vata* is the leading *Dosha*, as this is a disease related to *Jara* and *Asthi Dhatu*. Also, as *vata* gets provocated *Kapha Kshaya* takes place. *Vata Prakopa* and *Kapha Kshaya* manifests symptoms such as *Shoola, Rukshata, Ruja, Shrama* etc.

Dushya*: *Asthi is main Dushya in this disease with its Mala, Nakha and Kesha. But Kshaya of all Dhatus also occurs in later stage, hence all Dhatu including their Upadhatus can be c onsidered under Dusya.

Samprapti

Samprapti of Asthikshaya is not explained in *Ayurvedic* texts. Vitiation of Vataisthe main factor in *Samprapti* of *Asthikshaya.* Vitiation of *Vata* occurs by two ways; *Dhatukṣaya* and Margarodha. Therefore the *Samprapti* can be explained by two ways, one is *Dhatukṣhayajanya* and another is *Margavarodhajanya*. *Apatarpan* i.e. taking *Vataprakopak Ahara* (diet) and *Vihara* (living habits) leads to vitiation of *Vata* due to decrease in *Dhatus and the Srotas become Rikta (devoid of unctuousness)*. Vitiated *Vata* fills the *Rikta Srotas*. The walls of *Srotas* got stretched by the force of *Vata l*eading to weaken them and vitiated *Vata* overpower the weak *Srotas* to create disease.

Purvarupa

As we go through the classics, we cannot find about the *Poorvarupa* of *Asthikshaya. Vatavardhaka Nidana* along with the other *Nidana* itself forms the *Nidana* for the *Asthikshaya* due to the *Ashraya Ashrayi Bhava* of the *Vata a*nd *Asthi*. So *Vriddhavata* causes the disease *Asthi Kshaya*. As we all know that the *Poorvaroopa* in *Vatavyadhi* is *Avyakta*. *Chakrapani* in his commentary has clarified that *Avyakta* can be taken as *Alpavyaktata* or as *Asampoornalakshana* or as mild *Lakshana*. So, the *Lakshana* in their mild form can be taken as the *Poorvaroopa* of *Asthikshaya* in the initial stage of the disease. *Manda Vedana* (dull aching type of pain) in the *Asthi*, *Sandhi*, and *Mildness* of other *Lakshana* such as *Kesha, Roma*, *Nakha, Danta Vikara* (*Shadana* and *Bhanga*) may be taken as the *Purvarupa* of the disease *Asthikshaya*.[10]

Rupa (Symptoms of asthikshaya according to Different Samhitas)[11-12]

SN	*Lakshnas*	CH	SU	A.S	A.H	H.S
1	*Asthibheda*	+	-	+	-	-
2	*Asthitoda*	-	+	+	+	-
3	*Ruja*	-	-	-	-	+
4	*Asthi Shula*	+	+	-	-	-
5	*Kesha Vikara and Patina*	+	-	+	+	-
6	*Loma/Roma Vikara and Patana*	+	-	+	+	-
7	*Nakha Vikara and Patana*	+	+	+	+	-
8	*Smashru Vikara and Patana*	+	-	-	-	-
9	*Danta Vikara and Patana*	+	+	+	+	-
10	*Shrama*	+	-	-	-	-
11	*Sandhi shaitilya*	+	-	+	-	-
12	*Ruksha*	-	+	+	-	-
13	*Parushya*	-	-	+	-	-
14	*Asthibadda*	-	-	+	-	-
15	*Mamsabhilasha*	-	-	+	-	-

16	*Anga Bhanga*	-	-	-	-	+
17	*Ati Manda Chesta*	-	-	-	-	+
18	*Bala Kshaya*	-	+	+	+	-
19	*Medo Kshaya*	+	-	-	-	+
20	*Viryasya Mandya (Utsaha Hani)*	-	-	-	-	+
21	*Vikampana*	-	-	-	-	+
22	*Vamana*	-	-	-	-	+
23	*Visangnata*	-	-	-	-	+
24	*Shosha*	-	-	-	-	+
25	*Kathorata*	-	-	-	-	+
26	*Shophita*	-	-	-	-	+

Signs and Symptoms

Osteoporosis is a silent disease, until a fracture is sustained.

Clinical Findings

1. In early stages, following acute thoracic compression fracture, patients exhibit marked discomfort on sitting and standing.
2. Gait is normal but slow. Spinal movements considerably reduced, with more restriction in flexion than in extension.
3. Dowager's hump (thoracic kyphosis) may be present as a result of previous anterior compression fractures.
4. Involvement of lumber spine is noted byprogressive loss in lumber lordosis.
5. Axial height may be decreased.
6. Paravertebral muscle spasms are palpable and often visible. Spine and paravertebral muscles are tender on palpation and percussion over the level of fracture.
7. Bony point tenderness is usually absent as the fracture is in the anterior vertebral body of spine which are not palpable.
8. Most patients are totally pain free during the intervals between compression fractures; whereas some may complain of chronic, dull, aching postural pain in mild thoracic and upper lumbar region. This responds symptomatically to frequent, intermittent horizontal rest.[13]

Treatment of Osteoporosis

"Prevention Is Better Than Cure" is accepted as the crucial step in managing osteoporosis according to the contemporary science. Only when the disease is manifested and starts increasing the risk of complications, thereby becoming a threat to the patients‟ life, medical intervention is needed.

Prevention

According to R Handa in his textbook of Orthopaedics Routine physical activity, proper intake of nutritious food containing dietary calcium, magnesium, phosphorus and other minerals, Vitamin-D (dietary & auto-synthesis by exposure to sun), avoiding smoking, tobacco intake and alcohol consumption, avoiding the prolonged use of certain drugs such as cortico-steroids, anticonvulsants, heparin etc. and maintaining a disease free healthy body and mind are the golden tips for the prevention of Osteoporosis.[14]

By Following Ayurvedic principles and medications the disease can be managed.

Nidanparivarjana

It is the first and foremost method of managing the disease. The factors responsible for aggravation of Vata i.e. VataprakopakaAhara, Vihara, stress should be avoided. Aggravating factors for Osteoporosis should be avoided e.g. Smoking, alcohol, inactivity, poordiet. Stoppingthe indulgence of factors will increase the chances of getting disease or progression of disease.

Shamana

Vitiation of Vata takes place due to both Santharpana and Apatharpana. Apatharpana directly causes Vatavridhi, while Santharpana leads to Margavarodha which in turn causes Vatavridhi. Most of the metabolic diseases occur due to disturbance of Agni. When Agni is diminished, it leads to Ajeerna and further formation of Ama takes place. Ama further deteriorates the Agni leading to blockage of channels. Therefore, management of disease should start from the level of Jatharagni and Dhatwagni. It should be corrected by administration of Deepana and Pachana Dravyas in the form of Churna or Ghrita processed with these dravyas such as TrikatuChurna, Panchkola Churna,PippalyadiGhrita, Ardraka Ghrita.

Sudha Varga: For the treatment of diminished Dhatus, use of drugs which are similar to diminished Dhatus are indicated. These drugs bring about increase in that Dhatu[28] these include Pravalbhasma, Pravalpishti, Mukta shuktibhasma, Shankhabhasma, Kapardikabhasma, Kukkutandatwakbhasma

Guggulukalpa: Lakshadi Guggulu, Abhadi Guggulu, Trayodashang Guggulu, Yograj Guggulu.

Shodhana

Basti Chikitsais the major treatment modality for Vatadosha. Pakvashaya is the place of Purishdhara Kala which resembles Asthidhara Kala where BastiDravya reaches & it is also the main seat of Vata Dosha. Hence it acts on AsthiDhatu. Thus, Basti plays an important role in strengthening the AsthiDhatuand act as preventive measures for Asthikshaya.

Vaghbhatta had mentioned Tiktaksheera Basti in the treatment of Asthikshaya. For Asthipradoshaja Vikara, Charakacharya has given the similar line of treatment which includes Panchakarma, especially Basti which contains Kshira, Ghrita and Tikta Dravya.

Ahara (Nutrition)

Diet having low calcium, magnesium and vitamin-D; smoking or tobacco in any form, lack of exercise (sedentary life style), alcoholism, advanced age, history of fracture as an adult are etiological factors in postmenopausal osteoporosis. The nutrients of most standing to bone health are calcium and phosphorus, since they compose 80-90 percent of the mineral content of bone. Adequate calcium intake is important, with the current NOF guidelines recommending 1200 mg daily for women.

Absorption of calcium citrate may be as much as 24% more than with calcium carbonate. In postmenopausal women, the intake of vitamin D should be in addition to sunlight exposure. 180- 350 ug /day Vitamin K may be needed. Dried plum in its whole form has been observed to prevent bone loss in postmenopausal women, with long- lasting bone-protectiveeffects. Postmenopausal women who previously consumed 100 g dried plum per day during one-year clinical trial retained bone mineral density to a greater extent than those receiving a comparative control. drinks, fried foods, meat and processed products, sweets and desserts, and refined grains showed a beneficial impact on bone health. Overall, devotion to a healthy dietary pattern can improve bone mineral status and reduce the risk of osteoporosis.[15]

Vihara: Lifestyle modification; Aadequate physical activity is needed for maintaining bone health. Randomized clinical trials show that exercise training can prevent /minimize/reverse almost 1 % bone loss per year in both pre andpostmenopausal women.

Yoga and pranayama: Structured yoga- asanas, Pranayama, and Suryanamaskar induce improvement in BMD in postmenopausalosteoporotic female.[16]

DISCUSSION

In today's perspective, due to sedentary life style, faulty food habits and excessive stress metabolic diseases are occurring commonly. Asthikshaya is one among these diseases. The symptoms of Asthikshaya are similar osteoporosis in which there is decline in the bone tissue. A condition known as Osteopenia is considered as pre stage of osteoporosis. In this condition also, there is decrease in bone mineral density but it is not as notable as compared to Osteoporosis. Asthikshaya is the earlier stage characterized by different kinds of pain and deformities of Upadhatus and Malas of Asthi. As the disease progresses, as per the principles of Anulomakshaya, it will affect Majjadhatu and manifest as Asthisoushirya characterized by porosity of bone. So it is better to compare Osteopenia with Asthikshaya and Osteoporosis with Asthisoushirya.[17]

Menopause is inevitable. Ayurveda describes menopause as Rajonivrutti and it is a part of ageing process (jaravastha).There is anuloma kshaya in jaravastha where Rasa, rakta, Mamsa, meda asthi, majja and shukra dhatu start depleting. Asthikshaya in menopausal women is of concern as this may lead to fractures. Ayurvedic management of menopausal asthikshaya is based on bringing homeostasis of vata, pitta and kahpa dosha . Ayurveda takes integrated approach in prevention and treatment of a disease. Rajonivrutti kala affects body and mind both. Therefore though the manifestation is asthidhatu kshaya ; there is indeed an involvement of manas doshas. Ayurveda takes care of body ,mind and soul while treating the patient. As the predominance of Vata is seen menopause the vatashamak dravyas along with Basti is highly recommended. There ia also an association of Pitta dosha ; which is manifested through hot flushes. In these cases; different types of ghruta fortified with pittashamak herbs are beneficial.

Discussion On *Samprapti*

Samprapti of *Asthikshaya* is not a single pathogenic mechanism, whereas it is a complex mechanism. Hence the *Samprapti* of *Asthi Kshaya* is explained under two different headings *Samanya Samprapti* and *Vishesha Samprapti*.

According to *Acharya Charaka, Avruta Marga* of *Vata* causes it to become *Prakupita* and causes *Rasadi Dhatu Shoshana*. Obstruction of normal *Gati* of *Vata* (*Vyana Vata*) occurs due to the *Margavarana.* By this the *ahara rasa viksepa (rasa samvahana), dhatu vyuhana* and *agni samirana* functions of *vyana Vata* are affected. As a result of this, the *Ahara Rasa* containing the *posakamsas* to the *Dhatus* will not be able to reach and nourish the *Sthayi*

Dhatus, *Dhatu Vyuhana* i.e., specific arrangement and permeability of the *posakamsas* inside the *Sthayi Dhatus* will not be possible and the functions of the *Dhatwagnis* are also affected. This signifies the importance of *Medodhatvagni*. Vitamin D, which is derived from sterols, is essential for absorption of calcium in the body. Hence the *Moola* of *Asthi Vaha Srotas* is rightly considered as *Meda*. Imbalance in *Asthi Dhatvagni* leads to improper formation of *Sthayi Asthi Dhatu* from *Poshaka Asthi Dhatu*. Parathyroid hormone, calcitonin, estrogen etc. play significant role in metabolism of bone. These all can be classified under types of *Agni* acting at different levels. The *Ashrayashraayi* relationship of *Vata Dosha* and *Asthi Dhatu* forms a fundamental base to understand any pathological condition related to *Asthi Dhatu*.

As a combined effect of these factors *Dhatu Kshaya* occurs. According to the principles of *Ashrayaashrayibhava* explained by *Acharya Vagbhata*, *Asthi Dhathu* among the *Saptha Dhatu* is most fictile to be affected since *Vata* and *Asthi* are inversely proportional. So, to sum up briefly, it can be said that *Asthikshaya* is caused due to the *Dhathu Kshaya Karaka* and *Maragavarana Karaka*, *Nidana Sevana* causing the *Prakupita Vata* to fill the *Riktatata* in *Astivaha Srotases* which are barren of *Snehadi Gunas* and cause *Asthikshaya*.

CONCLUSION

Asthikshaya is a disabling disease which renders women a bedridden life. The prevalence of postmenopausal Asthi Kshaya is more in people aged above 40 years. Peak bone mass is attained by the age of 30 years. Asthikshaya is one of the Swabhavabala Pravrutta Vyadhi as in this Vaya (Vriddhavastha) plays major role along with Vata as Pradhana Dosha and Asthi as Pradhana Dhatu. Analysis of textual references regarding aetiology of Asthikshaya discloses fact that Vatakara Nidana plays a significant role in manifestation of Asthikshaya. It is concluded that any abnormalities in Vyana Vata, Udana Vata, Samana Vata Pachaka Pitta, Shleshmaka Kapha, Kledaka Kapha and Aharaja, Viharaja Nidana result in Asthikshaya. There is no textual reference regarding the Purvarupa of Asthikshaya, so Laxanas of Asthikshaya when expressed in mild nature are considered as Purvarupa of Asthikshaya. Laxanas of Asthikshaya are Asthishula/Toda/Bheda, Sandhi Shaitilya, Shrama, Danta Kesha Nakha Prapatana, Danta Bhanga, Nakha Bhanga. These Lakshanas have close resemblance with symptoms of postmenopausal osteoporosis in modern science which include pain in the back, deformity of spine, risk of developing fractures. Madhura Rasa Pradhana Dravya like Shali, Rakta Shali, Masha etc, Amla and Lavana Rasa Pradhana Dravya, Dugdha, Dadhi, Takra and Ghrta, Mamsa, Mamsa Rasa, Niyamita Vyayama, Abhyanga and Swedana,Vata

Nashaka and Vedana Shamaka Oushadhi are said to be the Upashayas of the Asthikshaya. Majja Kshaya, Shukra Kshaya, Oja Kshaya and Fractures - Anga Bhanga should be considered as complication of Asthi Kshaya. Menopause has been considered as a part of Jaravastha (Ageing process). Due to ageing; the risk of low bone mass and osteoporosis (Asthikshaya) is also increasing.

Ayurveda strains more on the prevention of diseases. By following proper Dincharya and Rutucharya, thedisease can be prevented.

The diet, lifestyle medicines and Panchkarma can help in the maintenance of bone health. These modalities reduce osteoporosis, enhance bone remodeling. Herbs that are rich in phytoestrogens, exercise, calcium and vitamin D supplementation can slow down the process of Asthikshaya. There is a scope of more clinical work to be done in this direction.

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