REVIEW ARTICLE ON ASTHI KSHAYA

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INTRODUCTION

Osteoporosis is a growing public health problem worldwide and is one of the most common bone disorder in India. The term describe a group of disorder in which absolute bone mass is less than normal. Osteoporosis affect > 10 million individual in the United States, but only a small proportion are diagnosed and treated. Currently it is estimated that over 200 million people worldwide suffer from this disease.\(^1\)

Osteoporosis is a 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.\(^2\) Osteoporosis, like many chronic disease such as heart’s disease and arthritis, has no early symptom and is diagnosed after a fracture. Osteoporotic fracture can become life threatening; nearly 24% of elderly people who suffers from a hip fracture die within one year of fracture and many other can never live independently again.

The adult skeleton undergoes a continuous process of remodeling where in bone resorption is coupled with bone formation. When bone resorption exceeds formation, then Osteoporosis occurs.

Bone is a live tissue. It has blood vessels and nerves. Skeleton is highly vascular it receives 10% of cardiac output. Bone grows, heals when fractured and remodels if fracture is misaligned. Unnecessary bones get reabsorbed.

Bone has 2 components:
1) Fibrous tissue which gives resilience and toughness and
2) Mineral which gives hardness and rigidity.
Collagen fibers have tensile strength like tendons. Mineral salt have compressional strength. Minerals i.e. calcium, phosphorus, zinc, magnesium, fluoride, etc are in the form of needle shaped crystals of hydroxyapatite and are arranged around collagen fibers. 35% of dry bone is osteoid i.e. organic ground substance (matrix made up of glycoprotein and collagen fibers Type 1).

**Bone has following types of cells**

1) Osteoprogenitor cells i.e. stem cells of mesenchymal origin converted to osteoblast when required.
2) Osteoblasts- Bone forming cells which lay down organic matrix and collagen fibers around which crystals are deposited. The osteoblasts also have estrogen receptors.[3]
3) Osteocytes provide nutrition to bone. The osteocyte is an important regulator of bone mass and a key endocrine regulator of phosphate metabolism.[4]
4) Osteoclasts- Large multinucleated bone removing cells derived from monocytes secretes acid and proteolytic enzymes that degrade bone. They perform the unique function of resorption of mineralized bone.[5]

Bone remodeling begins with resorption of bone by osteoclasts forming a “pit” which is subsequently mineralized by osteoblasts. Remodeling removes weak and older bone which is replaced by strong new bone in skeletal areas subjected to mechanical stress. In the first year of life, almost 100% of the skeleton is replaced. In adults, remodeling proceeds at about 10% per year.[6]

There are many causes and precipitating factors for osteoporosis, but post-menopausal females have the highest incidence of this disease. The female hormone estrogen is a major factor in the prevention of bone loss and maintenance of bone strength in women. At menopause, when the ovary cease to produce estrogen there is increased risk of bone resorption. Other causes are increasing age, Caucasian race, low body mass index (BMI), malnutrition (low Calcium diet), smoking, alcohol, prolonged corticosteroid therapy etc.

The treatment is mainly aimed at preventing further bone loss, maintaining the bone mass, prevention of fractures, calcium and vitamin-D supplementation, hormone replacement therapy (HRT) and use of certain drugs like Bisphosphonates, Selective estrogen receptor modulators (SERMs) etc.
Preventive measures for osteoporosis are regular exercise, healthy eating, preventing smoking and alcoholism and education about risk factor of osteoporosis.

Among the *Dhatus*, *Asthi* is blessed with the function of *Shareera Dharana*.[7] It is the *Asthi* which gives shape to the body and protect the vital organ.

*Asthi Kshaya* is a condition in which there is *Kshaya* (dimination) of *Asthi Dhatu* (bone tissue). *Asthi Dhatu* is the main site of *Vata Dosha*. According to the principal of *Ashrayashrayee Bhava,*[8] when *Vata* increase *Asthi Dhatu* decrease because, *Vata* and *Asthi* are inversely proportional to each other. Hence the etiological factor for *Vata vridhii* are the etiological factor for *Asthi Kshaya*. Apart from these, the etiological factor for the vitiation of *Medovaha*, *Asthivaha*, *Majjāvaha* and *Purishvaha Srotas* can also be taken as causative factor for *Asthi Kshaya*.

*Kshaya* means loss, decline, decay, diminution or waning. *Dalhan* has aptly defined *Kshayaas ‘Swapramānahāani’.*[9] whereas *Chakrapānidatta* describes it as *Rahasaha* or *Nyuntvam.*[10] These three Sanskrit words together are more than sufficient to explain the present concept of *Asthi Kshaya*.

Various terms such as *Asthisaushirya*, *Asthidaurbalya*, *Asthishieran*, *Ashitlāghav*, *Asthishunyatā*, *Riktata* and *Asthimārdav* appear in Ayurveda texts to describe *Asthi Kshaya*.

**Risk factors contributing for developing osteoporosis**

Osteoporosis is an asymptomatic condition that often does not become apparent until a fracture occurs. There is a long period of latency from onset to clinical manifestation of this disease. Hence, we must anticipate those patients who are at risk and take aggressive steps to prevent or reverse the condition before symptoms appear.

1. Female Sex
2. Advanced age
3. Current low bone mass
4. Nutritional factors:
5. Genetic factors:
6. Life style factor:
7. Medical disorders:
8. Drugs:
Eighteen type of Kshaya had been described by Acharya Charaka. Out of them three are because of Dosha, seven are because of Dhatu, seven are due to Mala Kshaya and one is due to Oja Kshaya. Asthi Kshaya is a type of Dhatu Kshaya.

Samprapti Ghataka

Dosa - Vata Pradhana (Vyanam, Samana), Pitta (Pacaka), Kapha (Kledaka and Slesaka).
Dusya - Asthi its UpaDhatu and Malas, Meda and Majja.
Agni - Jatharagni-Mandy, Bhutagnis-Parthiva, Tejasa and Vavyagni Mandy.
Ama - Jatharagni Mandy Janya, Bhutagni Mandy Janya and Dhatwagni Mandy Janya ama.
Srotas - Medavaha, Asthivaha, Majjavaha and Purisavaha.
Srotodusti type- Sanga.
Udbhava Sthana - Ama-Pakwasaya (Kostha).
Adhishthana - Asthi Dhatu Roga marga - Madhyama Roga prakrti – Cirakari.

Acc. to Acharya Charaka Chikitsa Sutra for Asthi Kshaya is the Dravya (substances) which have same Mahabhuta predominance (Swayoni), or which are similar in properties of that particular Dhatu are used for increase of that Dhatu.[11]

While describing management of Asthi Kshaya, Acharya Vagbhatta quoted that Vasti containing Ksheer, Ghrita and Tikta Rasa should be given.[12]

OBSERVATION

Vasti is regarded as prime treatment for Vata vitiation and Tikta Rasa is Asthi Vriddhi Kara. Dravya which are Snigdha, Soshana and Khara in Guna cause increase of Asthi as Asthi is Khara in nature. This combination is not present in any single Dravya. Hence Tikta Rasa...
which is having Soshana property, with Vasti of Kshira or Ghrita, which is Snigdha is recommended in Asthi Kshaya. Ksheer or Ghrita along with Vasti will act as Vata shamak and Tikta Rasa because of its Panchbhautika composition and Khara, Soshana Guna will increase Asthi Dhatu.

Panchkarma especially Vasti and use of Ksheer and Ghrita Siddha with Tikta Rasa should be given. Hemadri while quoting same reference in Ayurveda Rasayana on Astang Hridaya mentioned the view of Kharnada that Vasti and oral Tikta Rasa with Ksheer and Ghrita can be given in Asthi Kshaya.

This disease falls under Jarawastha. Jara is classified under Svabhavaja Vyadhi.[13] which become Yapya by Rasayana therapy.

DISCUSSION

Vasti

Vasti is the best known treatment modality used for Vata dosha and the vitiated Doshas located below the umbilical region. Pakvashaya is the place of Purishadhara Kala where vasti dravya reaches and it is also the main seat of Vata Dosha including Asthi therefore increased or decreased formation of Vata affects all the sites of Vata especially Asthi. Hence Purishadhara Kala is also considered Asthidhara Kala. So it invariably nourishes the Asthi also. Especially Tikta Sadhita Ksheer Sarpi Vasti is indicated in Asthi Pradoshaja Vikaras. Composition of Tikta Rasa is Vayu and Akasha Mahabhuta and as per Arunadatta Tikta Rasa has a unique property to maintain the Kharatva of Asthi Dhatu. Asthi also has predominately Pruthvi, Vayu and Teja Mahabhuta so Tikta Rasa invariably increases the Kharatva in the Asthi. Ksheer and Sarpi has predominantly Pruthvi, Jala Mahabhuta and Madhura Rasa. These properties will check the vitiated Vata Dosha. The provocation of Vata will result into Asthi Dhatu Dushti. Vasti is the best treatment explained for Vata Dosha so the Tikta Rasa in combination with Sneha Dravyas in the form of Vasti have a bifold nature i.e it provides sufficient nourishment to the Asthi Dhatu as well as check the Vata Dosha also.

Probable Mode of action of Panchtikta Ksheer Vasti in Osteoporosis

Panchtikta Ksheer Vasti fulfills above demand because milk and sneha pacify provoked Vata as well nourish Asthi and majja Dhatu while Tikta Rasa restores Asthi with its Khara property and Akash and Vayu Mahabhut dominance. Hence this principle was implemented
by Caraka while giving the line of treatment of Asthiashrita Vyadhi (bony disorders).

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\text{Tikta Rasa Pradhana Dravya} \hspace{1cm} + \hspace{1cm} \text{Sneha and Milk}
\]
(Vayu + Aakash Mahabhut Pradhana) \hspace{1cm} (With Snigdha Guna property)
(With Shoshana property)

Due to Sukshama Guna of Sneha Vasti Dravya reaches to Asthi Dhatu

Produce Kharta in Asthi Dhatu

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\text{Asthi Dhatu Vriddhi}
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Prevent Asthi Kshaya

Arunadatta opines that the combination of Singdha and Shoshana property produces Khara Guna which is also the property of Asthi. This nourishes the Asthi as per the Samanya Siddhanta. The Pachabhoutika composition of ingredients of Vasti is similar to Asthi. The ingredients will reach the Asthivaha Srotas and will be acted upon by Parthivagni, Vayavagni and Tejasagni and gets transformed into Asthi Poshakamshas on which the Asthi Dhatwagni will act upon and converts it into Sthayi Asthi Dhatu. Hence there will be increase of decreased Asthi.

Cow’s milk is the richest natural source of calcium present on the earth. The properties of cow’s milk are: Madhura, Sheeta, Mridu, Snigdha, Bahala, Slakshna, Pichhila, Guru, Manda and Prasanna.\(^{[14]}\) The ratio in which calcium and phosphorus are present is ideal for their proper absorption and assimilation and consequently for bone formation along with vitamin D. Vitamin D present in cow’s milk helps in bone formation by maintaining the proper levels of calcium in the blood along with the parathyroid hormone. Vitamin K activates osteocalcin the major non collagen protein in the bone. Cow’s milk also contains lactoferrin an iron binding protein that boosts the growth and activity of the osteoblasts, the cells that build bone and reduces the rate at which these cells die by up to 50-70%. These also decrease the formation of osteoclasts, the cells responsible for breaking down of the bone, thus helping to build the bone and prevent osteoporosis.
CONCLUSION

Modern drugs used for the treatment of osteoporosis (asthi kshaya) are having only prophylactic relief and also having a lot of adverse effect. Hence on the basis of Ayurvedic therapeutic principles of Asthi Kshaya (Osteoporosis), Panchtikta Ksheer Vasti has significant effect.

REFERENCES


