

**AYURVEDIC MANAGEMENT OF OSTEOPENIA/ OSTEOPOROSIS****Dr. Brijesh Singh\***

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**ABSTRACT**

Osteoporosis is a condition of major health importance because of its association with fractures. During the past decade, it has increasingly been perceived as serious disabling disease needing substantial involvement of all medical sciences to develop and assess potential treatments. We, being the learners of great science of life-Ayurveda, it is our moral duty to apply this invaluable system of medicine to assist people in journey towards better health in the latter half of life and add quality to life. In the contemporary science Osteopenia means decrease in the bone tissue. Osteoporosis is defined as “a progressive systemic skeletal disease characterized by low bone mass and loss of bone tissue that may lead to weak and fragile bones and increased risk for fracture of bones (broken bones), particularly in the hip, spine, and wrist”.<sup>[1]</sup>

Osteoporosis is a global dilemma that will increase in significance with the growing elderly population. The condition affects both the sexes and all races albeit to different degrees. Women are at high risk compare to men. The risk increases at menopause, which is a transition period of hormonal imbalance. Around the world, one in three women and one in five men over the age of 50 will experience an Osteoporotic fracture in their life time.<sup>[2, 3]</sup> Osteopenia is a condition where bone mineral density is lower than normal (T score – 1.0 to -2.5). Osteoporosis has been operationally defined on the basis of bone mineral density (BMD) assessment. According to the WHO criteria, Osteoporosis is defined as a BMD that lies (T score of <-2.5 SD).<sup>[4]</sup>

**KEYWORDS:** Osteopenia, Osteoporosis, Shodhana, Samana, Taila, Ghrita, Guggulu Kalpa, Ksheera Paka, Rasayana, Pathyapathya.

## INTRODUCTION

Osteoporosis is a condition of major health importance because of its association with fractures. During the past decade, it has increasingly been perceived as serious disabling disease needing substantial involvement of all medical sciences to develop and assess potential treatments. We, being the learners of great science of life-Ayurveda, it is our moral duty to apply this invaluable system of medicine to assist people in journey towards better health in the latter half of life and add quality to their life.

In the contemporary science Osteopenia means decrease in the bone tissue. Osteoporosis is defined as “a progressive systemic skeletal disease characterized by low bone mass and loss of bone tissue that may lead to weak and fragile bones and increased risk for fracture of bones (broken bones), particularly in the hip, spine, and wrist”.<sup>[5]</sup>

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**Etymology of Osteopenia:** Osteopenia is framed by two words ‘Osteo’ & ‘Penia’. The word ‘Osteo’ is derived from the greek word ‘Osteon’ means the ‘bone tissue’ and ‘penia’ means deficiency/ decrease so the combined meaning of word ‘Osteopenia’ is decrease in the bone tissue.

**Osteoporosis:** Osteoporosis is formed by two words ‘Osteo’ and ‘porosis’. As mentioned above, ‘Osteo’ is ‘bone tissue’ and ‘porosis’ is derived from the latin word means ‘Porosus’ which means ‘Full of Pores’. So the combined meaning of the word ‘Osteoporosis’ is ‘Porous bones’.

**Definition:** Osteopenia is a condition where bone mineral density is lower than normal. It is considered by many doctors to be a precursor to osteoporosis. More specifically, Osteopenia is defined as a Bone Mineral Density T score – 1.0 to -2.5.<sup>[8]</sup>

Osteoporosis has been operationally defined on the basis of bone mineral density (BMD) assessment. According to the WHO criteria, osteoporosis is defined as a BMD that lies -2.5

standard deviation or more below the average value for young healthy women (T score of <- 2.5 SD).

In other words Osteoporosis is defined as “a systemic skeletal disease characterised by low bone mass and micro-architectural deterioration of bone tissue leading to enhanced bone fragility and a consequent increase in fracture risk”.<sup>[9]</sup>

### **Physiology or Function of Bones<sup>[10]</sup>**

- 1) Performs mechanical function in the skeletal support & shape to the body. Forms leverage system where by movement & works are possible.
- 2) It affords protection the vital organs of the cranial and thoracic cavities and to the deep vessels and nerve from injury.
- 3) It serves as a great reservoir for minerals, specially calcium and phosphorus.
- 4) The bone cells helps in maintaining body's electrolyte balance, particularly the distribution of calcium and phosphorus ions.
- 5) They also have a detoxicating function. Elements such as lead, fluorine, arsenic, radium etc. are removed from circulation and are deposited in the bones and teeth.
- 6) It lodges the bone marrow, which is important in the formation of blood cells.
- 7) It serves as the basis for the attachment of (passive instrument of motion).
- 8) It is one of the chief sites of the reticulo-endothelial cells.
- 9) Lipids stored in cells of a second type of bone marrow called yellow bone marrow are an important chemical energy reserve.

**Etiological factors for Osteoporosis:** Osteoporosis is one of the metabolic bone disorders, which is caused by many factors. It may be seen as a consequence from the involutional losses associated with again and, in women, additional losses related to natural menopause. This condition is called as the ‘Primary Osteoporosis’. Osteoporosis that is caused or exacerbated by other disorders or medication exposure is referred to as ‘Secondary Osteoporosis’.

### **The risk factors and etiological factors of Primary Osteoporosis are as follows**

1. Advanced age.
2. History of fracture in an immediate relative.
3. History of fracture as an adult.
4. Low body mass index (BMI) < 19.

5. Female gender.
6. Caucasian race (white Americans of Asian origin).
7. Menopause/ Andropause.
8. Surgical menopause (radical hysterectomy or bilateral oophorectomy in early age).
9. Low calcium diet.
10. Magnesium and Vitamin- D deficiency.
11. Smoking or tobacco in any form
12. Alcoholism
13. Lack of exercise (Sedentary life style).
14. Astronauts (living in low gravity areas).<sup>[11]</sup>

### **The causes of secondary osteoporosis are**

#### **I. Genetic Disorders**

1. Elhar Danlos syndrome.
2. Menkey's steely hair Syndrome.
3. Osteogenesis imperfecta
4. Marfan's syndrome.
5. Glycogen storage disease.
6. Hemochromatosis etc.

#### **II. Hypogonadal states**

- |                              |  |
|------------------------------|--|
| 1. Androgen insensitivity    | 4. Hyper prolactinaemia                  |
| 2. Anorexia nervosa/bulimia. | 5. Premature menopause                   |
| 3. Athletic amenorrhea.      | 6. Turner's & klinefelter's syndrome etc |

#### **III. Endocrine disorders**

- |                                    |                         |
|------------------------------------|-------------------------|
| 1. Acromegaly                      | 4. Diabetes mellitus    |
| 2. Hyperparathyroidism (1° and 2°) | 5. Cushing's syndrome   |
| 3. Athletic amenorrhea.            | 6. Thyroid disease etc. |

#### **IV. Gastro-intestinal diseases**

- |                                |                                       |
|--------------------------------|---------------------------------------|
| 1. Gastrectomy.                | 4. Celiac disease.                    |
| 2. Inflammatory bowel disease. | 5. Primary biliary cirrhosis          |
| 3. Malabsorption               | 6. Protein calorie malnutrition (PCM) |

#### **V. Hematological disorders**

- |                      |                            |
|----------------------|----------------------------|
| 1. Sick cell disease | 4. Multiple myeloma        |
| 2. Thalassemia       | 5. Leukemias and lymphomas |
| 3. Haemophilia       | 6. Systemic mastocytosis   |

**VI. Rheumatological**

1. Ankylosing spondilitis
2. Rheumatoid arthritis

**VII. Drugs**

- |                     |                                    |
|---------------------|------------------------------------|
| 1. Thyroxine        | 5. Glucocorticoids                 |
| 2. Methotrexate     | 6. Gonadotropin- releasing hormone |
| 3. Anti convulsants | 7. Cyclosporines and tacrolimus    |
| 4. Anti coagulants  | 8. Cytotoxic drugs                 |

**VIII. Miscellaneous**

- |                               |   |
|-------------------------------|---|
| 1. Chronic metabolic acidosis | 5. Idiopathic hyper calcuria            |
| 2. Congestive heart failure   | 6. Immobilization                       |
| 3. Multiple sclerosis         | 7. Organ transplantation                |
| 4. End stage renal disease    | 8. Parenteral nutrition <sup>[12]</sup> |

**Pathogenesis of Osteoporosis:** Along with ageing, daily remodelling leads to a gradual restructuring of the bone. Resorption of the minerals on the inside of the cortical layer and in the bone cavity itself leads to an inexorable loss of trabecular bone and a widening of the bone cavity. This is partly compensated for the gradual addition of extra layers of mineral to the outside of the cortical layer.<sup>[13]</sup> The upshot is that overall the bones get slightly thicker. But the danger is that they are not getting any denser. In fact, peak bone mass, reached in early adulthood, gradually declines as people get older.<sup>[14]</sup> Bone architecture and continual remodelling combine to have a huge impact on the pathophysiology of osteoporosis. For example, young adults with wider femurs might be at higher risk for hip fractures late in life because, on average, wider bones tend to have thinner cortical layers. The thinner this layer is, the more susceptible it will be to resorption later in life.<sup>[15]</sup>

Osteoporosis has been classified as primary or secondary. Primary osteoporosis has been further divided into type I and type II.<sup>[16]</sup>

**Type I:** Osteoporosis is six times as common in women as in men. It is called postmenopausal osteoporosis because it occurs within 15 to 20 years after the onset of menopause. This type affects trabecular bone (50 %) more than cortical bone (30%) and manifests itself mainly by vertebral fractures and fracture of distal radius, (sites rich in

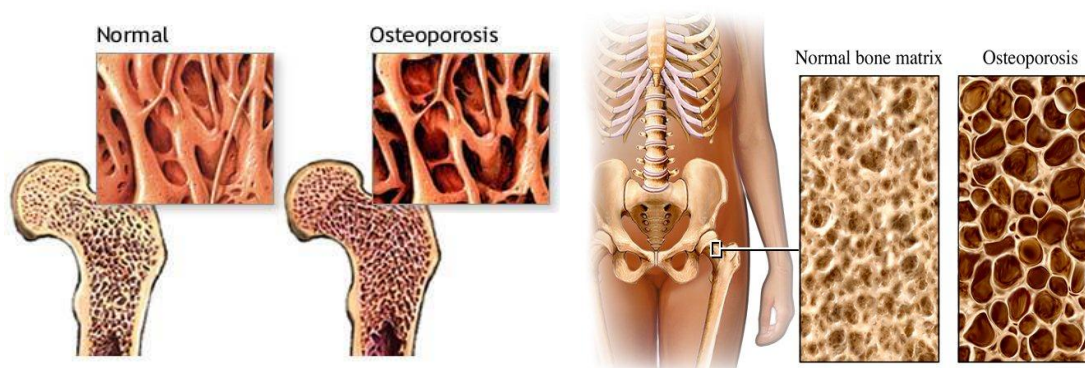
cancellous bone) of the painful crush type.<sup>[17]</sup> It is the high turnover form of osteoporosis, in which excessive osteoclastic resorption of bone is the primary defect.

**Type II:** Osteoporosis or age associated osteoporosis is twice as common in women as in men. A long history of calcium deficiency is largely responsible for this condition, which is called senile osteoporosis because it occurs in patients over the age of 70. Type II osteoporosis often leads to hip fractures as well as to painless vertebral fractures of the multiple wedge type. This form of osteoporosis is the low turnover form and is related to decrease osteoblastic bone formation. It affects all skeletal sites with both cortical and cancellous bone such as proximal femur.<sup>[18,19]</sup> Secondary Osteoporosis occurs with equal frequency in men and women. A full evaluation for secondary causes is necessary when the bone mass is more than 1.5 standard deviations below age corrected gender values. It has multiple aetiologies, including endocrine defects, malignancy, osteomalacia and long term use of corticosteroids and heparin.

**The clinical features of osteoporosis may be listed as follows.**

1. Pain (due to fractures)
2. Tenderness
3. General debility
4. Muscular weakness
5. Insomnia
6. Loss of appetite
7. Abdominal distension
8. Osteoarthritis
9. Constipation and ileus
10. Kyphosis and Scoliosis.

**Picture No. 1 & 2**



**UPASAYA AND ANUPASAYA**

Upasaya is that which give relief to the patient. It may be Ahara, Vihara or Aushadha.

**Upasaya**

1. Madhura Rasa Pradhana Dravyas like Shali, Rakta Shali, Masha etc
2. Dugdha, Dadhi, Takra and Ghrita (proper quantity)
3. Mamsa and Mamsa Rasa
4. Rest to the affected part may provide relief from pain to the patient of Asthi Kshaya
5. Niyamita Vyayama to keep bones strong
6. Abhyanga and Swedana
7. Vata Shamaka and Vedana Shamaka Aushadi

**Anupsaya**

1. Katu, Tikta, kashaya Rasa Pradhana Ahara.
2. Suska Saka, Mamsa, Mudga, Adhaki, Kalaya etc in excess.
3. Madya (alcohol).
4. Avyayama, Ativyayama & Sahasa etc
5. Tikshana Aushadhi (corticosteroid, heparin etc).

**Sadhyasadhya:** Asthi Dhatu is the 5<sup>th</sup> among the metamorphic change of Dhatus. There for it is a Gambhir Dhatu. Gambhir Dhatu Gata Vikara Yapya.<sup>[20]</sup>

If the patient of Asthi Kshaya approaches in the early stage and has indulge in Alpa Nidana Sevana. The Purvaroop and Roopa are Alpa his Bala is Pravara, Roga Bala is Pravara, and if Vaidya is wise enough to analyzed and treat the disease properly, then Asthi Kshaya may be Sadhya (Kastasadhya).

If the patient approaches the Vaidya after the onset of Upadrava such as Sarva Dhatu Kshaya Oja Kshaya and Asthi Bhagna, that is very late stages, then the condition becomes Yapya to treat. Over all to see Asthi Kshaya is Kastasadhya Vyadhi.

**Chikitsa:** The process of Samprapti Vighatan is termed as Chikitsa the following modas operandi can be formulated in the Chikitsa of Asthi Kshaya

1. Nidana Parivarjana
2. Shodhana
3. Samana



4. Rasayana
5. Pathyapathya

**Nidana Parivarjana:** Avoiding the indulgence in the causative factors is turn as Nidana Parivarjana and it is the treatment of prime importance of Ayurveda. The person suffering from Asthi Kshaya must avoid the indulgence in the etiological factors (Aharaja, Viharaja, Manasilka and Anya) discussed in the Nidana section above.

**Shodhana:** In Bahu Doshavastha, of a disease Shodhana Chikitsa is indicated. The Chikitsa Sutra mentioned for Asthi Kshaya is Basti prepared with Ksheera Ghrita and Tikta Dravya.<sup>[21, 22]</sup>

Apart from this the treatment mentioned by Charaka for Asthi Pradosaja Vikaras is also the same.<sup>[23]</sup> Here a question may arise in the mind of the scholar that, why Tikta Dravyas, which are said to be Vata Prakopaka are used in the Chikitsa of Asthi Kshaya. This is the result of Pravridha Vata. Arundatta has given an efficient answer to it. He says that Drvyas having Snigdha and Shoshana Gunas produce Kharatwa in Asthi Dhatu and increase in Asthi Dhatu, because Asthi Dhatu is also having Khara Guna. We cannot find a single Dravya which has both Snigdha and Shoshana Gunas. Therefore combination of Ksheera, Ghrita and Shoshana Gunas by Tikta Dravyas, because Shoshan is the main property of Tikta Drvyas.<sup>[24]</sup>

**Samana:** The use of Swayoni Dravyas in the management of Kshaya is advocated in Ayurveda.<sup>[25]</sup> The Dravyas which are Swayoni i.e. similar to the irrespective Dhatus as to be used for the treatment of the respective Dhatu Kshaya. Here in Asthi Kshaya Dravya similar to Asthi Dhatu should be used. This is based on the Samanya Siddhanta. This Samanya is described as of 3 types.

1. Dravya Samanya
2. Guna Samanya
3. Karma Samanya<sup>[26]</sup>

Among these Dravya Samanya is considered the best for the treatment of Dhatu Kshaya. The Samana Dravya for Asthi Dhatu is explained in classics as “Asthi Tarunasthana”.<sup>[27]</sup> The Samanya Dravya used for Asthi Kshaya is.

1. Ajasthi Bhasma
2. Asthi Bhasma of other animals



3. Shukti Bhasma (both Mukta Shukti and Jala Shukti)
4. Kukkutanda Twaka Bhasma
5. Kacchapa Pristha Asthi Bhasma
6. Praval Bhasma and Pisthi
7. Sankha Bhasma
8. Kapardika Bhasma etc.

The following preparations may also be advocated in management of Asthi Kshaya.

#### **Taila**

1. Ksheera Bala Taila
2. Chandana Balalakshadi Taila
3. Dhanvantari Taila
4. Bala Ashwagandhadi Taila
5. Lakshadi Taila
6. Maha Lakshadi Taila

#### **Ghrita**

1. Panchatiktaka Guggulu Ghrita
2. Patoladi Ghrita
3. Maha Tiktaka Ghrita
4. Panchtikatak Ghita
5. Tiktak Ghrita
6. Indukanta Ghrita

**Guggulu Kalpa:** Various Guggulu formulations in the Asthi Bhgnadi Kara and Vata Vyadhi Chikitsa can be given to the Asthi Kshaya. Patient who suffers from different types of pain the preparations are

1. Lakshadi Guggulu
2. Abha Guggulu
3. Yogaraj Guggulu
4. Maha Yogaraj Guggulu
5. Aditya Paka Guggulu etc.

**Ksheera Paka**

1. Arjuna Ksheera Paka
2. Ashwagandha Ksheera Paka

**Rasayana**

1. Ashwagandha
2. Shatavari
3. Dwitiya Brahma Rasayana
4. Chaturtha Triphala Rasayana
5. Chyavanprash Rasayana
6. Shilajatu Rasayana

**Pathyapathya**

**1. Pathyas:** Madhura Rasa Pradhana Dravyas, Shali, Masa, Ksheera, Dadhi, Mastu, Dadhi Mastu, Takra, Navneeta, Ghrita, Mamsa, Mamsa Rasa, Vata Nashaka Tailas, Niyamita Vyayamas.

**2. Apathyas:** Katu, Tikta, Kashaya Rasa Pradhana Dravyas, Ruksha, Sheeta, Laghu, Vishada, Shushira etc. Gunas. Pradhan Dravyas, Madya (alcohol) Shuska, Shak, Shuska Mamsa, Adhyasana, Anasanadi Mithyahara, Ativyayama and Ativyavaya. Bala Vadvigraha, Gaja, Turangadi Sigr Yana, Divaswapna and Ratrijagaran, Vegadharan, Tiksna Aoushadhis, Tiksna Aushadi smoking and other Nidanas which are explained in Nidana section.

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