ABSTRACT
Osteoporosis is a disease of bone in which absolute bone mass is less than normal. The risk of fracture is increased in this disease. In most western countries the risk of the condition is about twice as high in women, with approximately 40% of women over 60 years of age being osteoporotic. It is classified as primary osteoporosis and secondary osteoporosis. In Ayurveda it can be correlated with Asthi Majja Kshaya. Asthi is a site of vata and this disorder is also more prevalent in old age which is vata predominant age. So it can be considered as a Vata predominant Vyadhi. In modern medicine it is treated with bisphosphonates, raloxifene, and teriparatide, and denosumab, hormone therapy, combination therapy. Ayurvedic management includes Nidana Parivarjana, Samshodhana Chikitsa and Samshamana Chikitsa. Ayurvedic medicine Asthishrunkhala Ghrit Guggulu can be an alternative for modern medicines. Asthishrunkhala along with Ghrit and Guggulu breaks the pathogenesis and provide relief to patient.

KEYWORDS
Asthi, Asthishrunkhala Ghrit Guggulu, Osteoporosis, Asthi Majja Kshaya
INTRODUCTION

Osteoporosis term describes a group of bone disorders or osteoporotic syndrome in which the absolute bone mass is less than normal. There is increased risk of fracture in this disease. The most common sites are the spine, hip and wrist. Results of these fractures include disability and even death. The factors that may increase the rate of bone loss include a low calcium diet, a sedentary life style, cigarette smoking, low body weight, early menopause, use of medicine (for example - cortisone-like drugs) etc. It is silent condition as there are no symptoms of low bone density. It is diagnosed with certain techniques, among them, DEXA is widely accepted. Ayurveda has proved to be effective in these type of disorders. Asthi majja kshaya is majorly explained in most of the ayurvedic granthas as one of the 18 kshayas.

In most western countries the risk of the condition is about twice as high in women, with approximately 40% of women over 60 years of age being affected. The higher incidence of osteoporosis in women may reflect their tendency to live longer than men as well as the occurrence of a period of increased rate of bone loss around the time of, and for some years following, the menopause. Indeed, because women are at higher risk and have longer lifespan, the cases of hip fracture in women are 3-4 times more than in men1.

This said, osteoporosis is seen to particularly affect white-skinned people from North America, Northern Europe and elsewhere. The risks for osteoporotic fractures are substantially lower in many parts of Asia, Africa and South America. Some sorts of changes like the estimated size of the population aged over 50 years will increase 130-150% in Europe and about 200% or more in all other regions, with the most marked increase in Asia between 1990 and 2025, suggest that the number of hip fractures annually will rise from around 1.5 million worldwide in 1990 to between 4 and 6 million in the year 20252.

DISEASE REVIEW (MODERN)

The term osteoporosis consist of two words: osteo and porosis. In Greek osteo means bone tissues, and porosis is derived from a Latin word porosus which means full of pores3. World health organisation defines osteoporosis as a “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”4. Some other definition is based on bone mineral density (BMD) measurements of the hips and spine.
WHO criteria for diagnosis of osteoporosis:
Diagnosis of osteoporosis is based on a standardized score, known as T score, comparing BMD to average values for young.

<table>
<thead>
<tr>
<th>Level</th>
<th>Definitions</th>
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</thead>
<tbody>
<tr>
<td>Normal</td>
<td>T score -1.0 and above</td>
</tr>
<tr>
<td>Low bone mass (osteopenia)</td>
<td>T score between -1.0 and -2.5</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>T score -2.5 and below</td>
</tr>
<tr>
<td>Severe and established osteoporosis</td>
<td>T score-2.5 and below with history of fracture</td>
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Classification of Osteoporosis
Osteoporosis is classified as primary osteoporosis and secondary osteoporosis. Primary osteoporosis has been further divided into type 1 and type 2 osteoporosis.

A) Primary osteoporosis
a) Post-menopausal osteoporosis (type1) - this is most common form of osteoporosis occurring in women between 51 and 75 years of age as a result of cessation of ovarian function. This cessation activates osteoclasts. Also, bone becomes more sensitive to the reabsorption stimulating action of parathyroid hormones. As a result of this, there is increased resorption of cancellous bone with a corresponding increase in fracture risk.

b) Age related osteoporosis (type2) - It occurs in patients over the age of 70 years, hence called senile osteoporosis. History of chronic calcium deficiency is mainly responsible for this condition. It is related to decrease osteoblastic bone formation. It affects all skeletal sites with both cortical and cancellous bone.

B) Secondary osteoporosis:
It occurs due to endocrine defects, malignancy, osteomalacia, long term use of corticosteroids and heparin etc.

- Endocrine causes- Cushing’s syndrome, thyrotoxicosis, hypogonadism, pituitary insufficiency, athletic amenorrhea
- Drugs- corticosteroids. Heparin, anticonvulsants
- Inherited- osteogenesis imperfect, homocystinuria, anorexia nervosa, alcoholism, malabsorption syndrome
- Others- chronic hepatic disease, juvenile pregnancy

Symptoms
1. Increasing stooping- incremental loss in height and mild kyphosis
2. Episode of joint or muscle aches
3. Difficulty getting up from a chair without using arms to push
4. Acute pain in middle to low thoracic or high lumbar region
5. Acute onset of back pain followed by a vertebral compression fracture ids common symptom indicating a new fracture
6. Fracture of femur after little or no trauma, fracture of distal radius during a
fall, intracapsular and intra trochanteric fractures of femur, hip fractures and wrist

AYURVEDIC REVIEW

In Ayurveda, osteoporosis is likely to be asthi majja kshaya or asthi saushirya which means saushirya of sthaya asthi dhatu in which the asthi become porous. Vayu and asthi have ashraya ashrayi bhav⁹ so the factors which provoke vata are supposed to provoke asthi majja kshaya. According to different Ayurveda granthas, the symptoms of asthi kshaya are as follows:

1. Hair, nails, beard fall- these are the malas of asthi dhatu. Due to improper nutrition of asthi dhatu, the mala of asthi dhatu also don’t get nutrition leading to hair fall and brittleness of nails.

2. Pain – the variety of pains are mentioned in samhita due to asthi kshaya. As vata is predominant in asthi kshaya and pain is the cardinal symptom of vata, it is obvious to have varieties of pain mentioned below:
   • Asthitoda- intermittent pricking type of pain¹⁰
   • Asthiruja- uninterrupted constant type of pain¹¹
   • Asthibheda- severe pain which feels like breaking of bone¹²
   • Asthisshoola- continuous pricking type of pain

3. Teeth problems- teeth fall in the category of ruchak asthi, with kshaya in asthi, teeths will also be affected.

4. Tiredness and weakness- the resistance of the body against workload produces this symptom. There is bala kshaya in asthi kshaya due to vata prakopa and dhatu kshaya, which ultimately leads to tiredness and weakness.

5. Brittleness and fracture- due to the loss of bone tissue, bones become more and more brittle making them more susceptible to the fractures.

6. Tremors- It is found in later stages of disease when there is excessive deterioration of the condition and excess vitiation of vata

SAMPRAPTI

When it comes to samprapti of asthi majja kshaya, ayurvedic classics have not mentioned about it. But Acharya have mentioned about the ashraya-ashrayi bhava. Vata is resident of asthi and they share a reciprocally proportional relationship¹³. So all the vata aggravating factors cause asthi kshaya. The proper functioning of jatharagni, bhutagni, and dhatwagni is essential for “samyak dhatu poshan prakriya”¹⁴ in order to maintain the qualitative and quantitative normalcy of the dhatus. Functional deformity in any of these agnis leads to the abnormality in the transformation of poshaka dhatu into
poshya or sthaya dhatu, resulting in dhatu vikriti.

dhatu vikriti.

**Nidan sevan**

- Srotoavarodh
- Vata prakop
- dhatvagni mandya
- Uttarotar dhatupposhan badhit
- Agni dushti
- sthulasrotoavarodh
- Aam formation

**Asthimaajja dhatu kshaya**

**MODERN MANAGEMENT**

Management consist of non-pharmacological and pharmacological treatments

- **a) Non Pharmacological Measures**
  It includes strategies like – prevention from falling, exercise and physical therapy, quitting addiction and taking proper diet. Consuming more than 2.5 units of caffeine daily (1 unit = one cup of coffee or two cups of tea) may increase fracture risk.\(^{15}\)

- **b) Pharmacological Measures**
  It includes bisphosphonates, raloxifene, teriparatide, and denosumab, hormone therapy, combination therapy.

**AYURVEDIC MANAGEMENT**

Ayurvedic management includes:

- **1) Nidan Parivarjana** – avoiding disease causing factors
- **2) Samshodhana chikitsa**
  a) *Basti Chikitsa-Basti* acts on Asthivaha and Majjavaha srotas and plays an important role in strengthening bones. Acharya Charaka described in *Sidhhisthana* that *Matra basti* plays an important role in *Vataja Vikara* and *Bhagna Vikara*.
  b) Other *Upakrama* - In acute pain due to Asthivikara, *parisheka* (Taila dhara), *Bandhana, Vedhana, Raktamokshana* plays important role in reducing the pain. *Sechana or parisheka* is done by vataghna
dravya siddha oil, Nyagrodhadi kashaya. Laksha sidhha milk is taken internally for strengthening of the bones.

3) Samshamana Chikitsa

The following herbs are useful in strengthening the bones and also useful in fractures.

a) Asthishrikhanla (Cissus quadrangularis)-
b) Ashwagandha- (Withania somnifera)
c) Arjuna (Terminalia Arjuna)
d) Gandha Tailam

In this article, the role of Asthishrunkhala ghrita guggulu in Osteoporosis is being described.

DISCUSSION

ASTHISHRUNKHALA

- Latin name- Cissus quadrangularis
- Family- vitaceae
- Common name- veld grape
- Pharmacodynamics- rasa- madhur kashaya;guna- guru, snigdha, tikshna;virya- ushna; vipak- katu; doshaghanata- tridoshashamak
- Part used- stem
- Active ingredients- contains high amount of Carotene A, anabolic steroidal substances and Calcium. The plant contains ascorbic acid, 479 mg and carotene, 267 mg per 100 g freshly prepared paste, in addition to calcium oxalate. The stem of the plant contains two asymmetric tetracyclic triterpenoids, onocer- 7 ene 3 α, 21 β diol and onocer- 7 ene-3 β, 21 α diol, etc.

GUGGULU

- Latin name- Commiphora mukul
- Family- Burseraceae
- Other names- guggulu, kaushik, pura, palankash, mahishaaksha, kalaniryasa, devadhoopa, jatayu
- Pharmacological properties- rasa- katu, tikta; guna- laghu, tikshna, vishada, sukshma, sara; virya- ushna; vipak- katu; doshaghanata- tridoshashamak
- Part used- gum exudates
- Chemical composition- steroidal constituents, which include, cholesterol, 4,17(20)-(trans)-pregnadiene-3,16-dione (I), 4,17(20)-(cis)-pregnadiene-3,16-dione (II) and three new sterols—guggulsterol-I, guggulsterol-II and guggulsterol-III

GO–GHRIT

- Latin name- Butyrum depuratum
- Bhautik sangathan- prithvi and ambu
- Chemical composition- saturated fatty acids, triglycerides, diglycerides, monoglycerides, phposholipids, contains beta carotene 600 IU and vitamin B, A, D and K2

Asthi majja kshaya is majorly explained in most of the ayurvedic granths as one of the 18 kshayas. The dushti of jatharagni affects the digestion of food resulting in improper
nourishment of asthi dhatu resulting in asthi kshaya. Also, asthi and vata dosha have ashra ashrayi relation, due to which when vata increases there is more kshaya of asthi. In Ayurveda, it is said that, vata is Pradhan in old age. This satisfies the fact that osteoporosis is common in old age. There is no cure for osteoporosis, the only aim of treatment is to protect and strengthen the bones. Medical care includes administration of calcium, vitamin D and anti-osteoporotic medication and treatment of the secondary cause. According to Ayurveda, the principle of treatment in this case includes pacification of vata and maintenance of Agni, and increase in asthi dhatu. Asthishrunkhala ghrit guggulu can be a better drug for the same as asthishrunkhala has the properties to pacify vata and it increases asthi dhatu and as it is prepared with ghrit and guggulu, its properties are enhanced by their sanskaranauvartan and sukshma guna.

**The drug and its mode of action:**
The main content of asthishrunkhala ghrit guggulu is asthishrunkhala and guggulu. 1. *Cissus quadrangularis* contains high amount of carotene A, anabolic steroidal substance and calcium. It also contains ascorbic acid and saponins that affect the permeability; of the small intestinal mucosal cells due to its strong surface active properties and thus have an effect of active nutrient transport. In many researches it is seen that it has ability to speed bone healing showing it act as a glucocorticoid antagonist. It also increase the bone tensile strength faster and is very helpful in degenerative conditions of bones. Hence it can be of great significance for osteoporosis. 2. *Guggulu* has anti-inflammatory and anti-arthritic properties. It is anti-aging in nature. It improves digestion and strength. Guggululsterone isolated form *commiphora mukul* has effect on osteoclast formation and hence prevent osteoporosis. The oleo- resin fraction has much anti-arthritic and anti-inflammatory activity. Other content of the drug is *Trikatu*. It has been proven that *Trikatu* especially alkaloid poperine to have a bio enhancing or potentiating effect when mixed with other drugs. Studies show the piperine also have effect on both osteoblast and osteoclast. It increases the osteoblastic activity and decrease the osteoclastic activity.

**CONCLUSION**
From the above discussion it can be concluded that, *Asthishrunkhala Ghrit Guggulu* can be a boon for the osteoporotic patients with minimal or no side effects. *Asthishrunkhala Ghrit Guggulu* is a purely
herbal medicine and can be used as an alternative for modern medicines because of its minimal or no side effects.
REFERENCES


