TO STUDY THE CONCEPT OF ASTHIKSHAYA (OSTEOPOROSIS) WSR TO STROTAS

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ABSTRACT
Ayurveda is a holistic health science. The principle aim of Ayurveda is to maintain the health of healthy people and to cure the disease of patient. In present scenario many Non communicable diseases creates more challenges in front of health science. A Non communicable disease (NCD) is a medical condition or disease that is non infectious or non contagious. Osteoporosis (OP) is an important non communicable disease. The incidence of osteoporosis is increasing day by day. It is more common in women and old age people. Osteoporosis is a metabolic systemic disease which is characterised by reduced bone mass and changes in bony tissue. Ayurveda is recognized as leading life science and explain ways to prevent and manage life style disorders. Ayurvedic principles give much knowledge in the form of proper diet (Ahara), life style management (Dincharya), rejuvenation therapy (Rasayana) etc. In Ayurveda there is no exact clinical condition mentioned in samhitas like Osteoporosis. But Ayurvedic literature described eighteen types of kshaya. Among those Asthikshaya may be considered as osteoporosis. This paper presents an ayurvedic concept regarding the role of Strotas in asthikshaya which is described in Ayurvedic samhitas.

KEYWORDS: Asthi dhatu, Asthivaha Strotas, Asthikshaya, Osteoporosis.

INTRODUCTION
Ayurveda says that “Dosha dhatu mala mulam hi shareeram”.[1] It means Shareera is made up of tridoshas, saptadhatus and trimandalas, this indicates the anatomical as well as physiological components of the body. The seven dhatus are rasa, rakta, mansa, meda, asthi, majja, shukra. The function of dhatu is dharana of the Shareera i.e. “dharnaat dhatavahah”. The balancing state of all seven dhatus is called health and their disequilibrium is called disease.[2] This disequilibrium may either be increase or decrease in dhatus. Increase in dhatu is called dhatu vriddhi and condition of decreases is called dhatu kshaya. In charaka samhita sutrashan there is eighteen types of kshaya are described¹. Asthikshaya (decrease in bone tissue) is a type of dhatu kshaya. In Asthikshaya there is reduction of Asthi dhatu. This leads to symptoms related to asthi vikrati. Similarly to this, there is a state known as Osteoporosis in modern medical science. Osteoporosis means “Porous bones” or “Brittleness of the bones” due to decrease in bone mineral density (BMD). In Ayurveda there are many upakarma (procedures) to prevent and manage the condition like asthikshaya.

AIMS AND OBJECTIVES
1. To understand the concept of Asthikshaya according to Ayurveda.
2. To study the role of Strotas in asthikshaya.
3. To review the study of Osteoporosis according to modern science.

MATERIAL AND METHOD
The study is based on review of ayurvedic samhitas and Modern text. In this study the following points is going to be discussed.
1. A Collective study on Asthi Dhatu, Strotas & Asthikshaya from Ayurvedic samhita.
2. A collective study on Osteoporosis from modern text.
3. Various research articles published in online journals.

Ayurvedic Review
Asthi Dhatu: Asthi dhatu is the fifth dhatu among all seven dhatus. According to ayurveda the origin of asthi dhatu is pitraj bhavatmakâ³. In the process of dhatu pashana, part of medo dhatu reaches in next Strotas that is asthivaha Strotas, it takes part in production of asthi dhatu. Asthi dhatwagni acts on part of ahara rasa as well as nutrients which are coming from medovaha Strotas, and then produces asthi dhatu. There are two types of dhatu, i.e. sthayi dhatu and pashaka dhatu. Asthi or bone can be considered as sthayi dhatu, not the whole asthi dhatu. According to Chakrapani commentary on Charaka vimana sthana that, Asthi dhatu is also in liquid
form called as Poshaka Asthi that flows through the Asthivaha Strotas and nourishes the sthaya Asthi dhatu.[5]

Total no. of asthi which is described in ayurvedic classics is as below.

<table>
<thead>
<tr>
<th>1. Vedavadi</th>
<th>Charaka samhita, ashtang sangraha, ashtang hridaya, kashyapa samhita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Shalyatantravadi</td>
<td>Sushruta smahita, bhavapракsha</td>
</tr>
</tbody>
</table>

Sushruta described 5 types of asthi, these are as follows.[6]
1. Kapalasthi
2. Ruchakasthi
3. Tarunasthi
4. Valayasthi
5. Nalaasthi

According to sharangdhara samhita upadhatu of asthi dhatu is “danta”. The asthi dhatu mala is described by acharyas as follows.

| 1. Charaka samhita | Loma, kesha |
| 2. Sushruta samhita | Nakha, roma, kesha |
| 3. Sharangdhara samhita | Nakha |

Asthikshaya: Eighteen types 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. Asthikshaya is a type of Dhatu Kshaya.

Sign and Symptoms of Asthikshaya
In Ayurvedic classics there is no exact clinical condition mentioned similar to Osteoporosis but it can be correlated to Asthikshaya. The clinical features of Asthikshaya are Asthishula, Toda, and Sandhi Shaithilaya, Kesha, Loma, Nakha, Danta Vikara and Pauta, Dourbalya, Rukshata[7] etc.

One more condition is mentioned in ayurveda related to this point, named as asthisaushriya. Asthisaushriya is only a symptom under the condition of majjakshaya, not the separate condition. According to Hemadri commentary the meaning of word ‘saushriya’ is ‘sarandhratvam’ which means with pores.[8]

Strotas Involved in Asthikshaya
1. Asthivaha Strotas: Strotas are the channels of circulation that carry the nutrients of dhatus. According to chakrapani poshak asthi flows in asthivaha Strotas in the form of asthayi asthi dhatu, and provides nutrients to sthaya asthi dhatu (bone). When asthivaha Strotas dushti happens the flow of poshak asthi dhatu will also affected. This produces asthikshaya.

2. Medovaha Strotas: Medo dhatu is the just previous to asthi dhatu and provides the poshakansh sara to the asthi dhatu. When medovaha Strotas dusti occurs it leads to the lack of poshakansh sara. This results less nourishment of next dhatu i.e. asthi dhatu, hence asthikshaya originate.

3. Majjavaha Strotas: Majjavaha srotos dushti like viruddha and abhishyandi dhaara causes amotpatti. Ama can cause obstruction in way of vata (margavrodh), as well as shortage of nutrients in dhatu poshana process it can results in form of asthikshaya.

4. Purishvaha Strotas: Dalhana said that asthidhara kala is same like purishdhara kala.[9] So according to this consideration whenever dusti of purishvaha Strotas takes place it also leads to the dusti of asthivaha Strotas. This ultimately results in asthikshaya. So above described Strotas is related to the asthikshaya.

Modern Review
Osteoporosis: Osteoporosis is a condition that weakens bones, making them fragile and more likely to break. Osteoporosis means “porous bone. Greek word osten means the bone tissue & porosis is derived from latin word “porous” which means “full of pores”. Thus combined meaning of the word Osteoporosis is “porous bones”. Osteoporotic bones have lost density or mass and contain abnormal tissue structure. As bones become less dense, they weaken and are more likely to break. The spine, hips, ribs and wrists are common areas of bone fractures from osteoporosis. Osteoporosis is a growing public health problem worldwide and is one of the most common bone disorders in India. Bone density is determined by the amount of bone present in the skeletal structure. Osteoporosis develops slowly over several years and often only diagnosed when a minor fall or sudden impact causes a bone fracture. The adult skeleton undergoes a continuous process of remodelling where in bone resorption is coupled with bone formation. When bone resorption exceeds to formation, then Osteoporosis occurs.

Risk Factors of Osteoporosis[10]
1. Age: - Old age is more affected from osteoporosis
2. Gender: - Women get osteoporosis more often than men.
3. Family history
4. Sex hormone: - Low oestrogen level in women and low testosterone in men causes osteoporosis.
5. Nutritional factors
6. Genetic factors
7. Life style factors

Symptoms of Osteoporosis
Symptoms of Osteoporosis include
1) Pain (due to fractures)
2) Tenderness
3) General debility
4) Muscular weakness
5) Abdominal distension
6) Insomnia
7) Loss of appetite.
8) Osteo-arthritis.
9) Kyphosis and Scoliosis.

Diagnosis
Radiological Assessment: X-ray, Bone mineral density (BMD) measurements, Quantitative computed tomography (QCT), MRI and Ultrasound.

DISCUSSION
We saw that teeth, nails and hairs are related to the *asthi dhatu*. That’s why reduction of *asthi dhatu* shows the symptoms of destruction in nails, teeth and hairs also. These features are mentioned as the symptoms of *asthikshaya*.

There is no direct reference between *asthikshaya* and osteoporosis, but the main symptom of osteoporosis is porus bone and these features are related to *majjakshaya*. Majja is the next *dhatu* of *asthi* according to “dhatu poshana nyaya”. Hence in the process of *ks haya*, *Majjakshaya* occurs when there is no proper supply of nutrients from *Asthi dhatu* because of *asthikshaya*. So we can say that the *asthikshaya* is responsible for osteoporosis.

According to “ashrayaashrayi bhava”, the *asthi dhatu* is the *ashraya* of *vata*. As asthing hridaya says that the increase & decrease of *Asthi* & *vata* are inversely proportional to each other i.e. when *vata* increases *asthikshaya* decreases & when *vata* decreases *asthi dhatu* becomes increase. Ayurveda says that *vata dosha* is dominating in *vrriddhavastha* (old age), so this can leads in decrease of bone in old age. Previous studies suggest that lower level of oestrogen causes menopause symptoms. Menopause marks the transition from *pitta* phase to *vata* phase of life. In this stage some symptoms of increased *vata* appear, like vaginal dryness, clouded mind and thin dry skin. This indicates lower oestrogen level causes increase in *vata*, and increased *vata* results in *asthikshaya*. That’s why after menopause women are more prone to affect osteoporosis.

CONCLUSION
From above all discussed point and review on ayurvedic *samhitas*, we can say that ayurvedic *samhitas* described *asthi* (bone) in form of *sthayi asthi dhatu* and the function of *sthayi asthi dhatu* is *Shareera dhaaran* (stability).

Increased *vata* is responsible for *asthikshaya* that’s why the prevalence of osteoporosis is more in old age people. The symptoms of *asthikshaya* are almost similar to osteoporosis, but main symptom (porus bone) is described under *majjakshaya*. *Asthi* is filled by *majja* and *asthikshaya* is the main cause of *majjakshaya*, so ultimately *asthikshaya* is responsible for porus bone (osteoporosis).

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