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A Bird Eye View on the Role of Ahara in the Maintenance of Bone Health W.S.R. to *Shimbidhanya*

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ABSTRACT:

The basic theory of Ayurveda is based on the state of equilibrium of *Tri Dosha*, *Sapta Dhatu* and *Tri Mala*. In *Ayurveda*, the seven fundamental principles (elements) that support the basic structure and functioning of the body. They consist of *Rasa Dhatu* (lymph), *Rakta Dhatu* (blood),*Mamsa Dhatu* (muscles), *Meda Dhatu* (fat), *Asthi Dhatu* (bone), *Majja Dhatu* (marrow (bone and spinal),*Shukra Dhatu* (semen). Traditional texts often refer to these as the Seven *Dhatus* (Saptadhatus).

Ayurveda states that a *Vata* imbalance is the cause of bone loss or decreased bone mass. It makes sense to eat foods that balance *Vata Dosha* and are high in calcium in order to treat this condition with an *Ayurvedic* diet. *Shimbidhanya* (pulses) is considered to be the most revered calcium source in *Ayurveda*. However, *Ayurveda* adds a recommendation on how to include this richness in our diets. Most importantly, it needs to be used properly and well administered. Natural calcium nourishes the bones and keeps them from deteriorating.

In particular for women who have been handling work and household responsibilities, which tend to cause bone deficiency due to overexertion, healthy and strong bones are the foundation for a fit and healthy life in the future. Currently, vitamin D deficiency is widespread across the spectrum and is more prevalent in women over the age of 35. Numerous factors, including hormonal changes, a slow metabolism, postpartum, and menopause, can also cause a bone deficit. Bone degeneration can also be caused by conditions like knee joint stiffness, discomfort, edoema, and tenderness. Women should consume a diet high in calcium, engage in regular exercise, and practise yoga to maintain strong, healthy bones.

The purpose of this paper is to identify specific nutritional components for maintaining bone health, their effects on the bone, and the level of availability in a general *Ayurvedic* diet. A summary of *Shimbidhanya* is described specially.

Keywords: *Asthi*, Bones, Calcium, *Dhatu*, *Shimbidhanya*, *Vata*.

INTRODUCTION:

Concept of Alkalizing Diet:

Depending on their mineral containing capacity, all foods, after being digested and absorbed, leave either an acidic or an alkaline ash in the body. The average human body is 80% alkaline and 20% acid. This is the equilibrium between acid and alkaline.[i] The acid-alkaline diet and alkaline ash diet are other names for the alkaline diet. Its basic principle is that our diet can change the pH level of our bodies. It has been said that our metabolism is like fire because it turns food into energy. It requires a chemical process that breaks down a solid substance. There is an ash residue left over after something burns. Similar to this, the food we eat leaves behind a substance called metabolic waste, or "ash". This metabolic waste can be neutral, acidic, or alkaline. The premise behind this diet is that metabolic waste can directly impact on our bodies acidity.

In other words, eating foods that produce acidic ash increases the acidity of our blood. Consuming meals that produce alkaline ash causes our blood to become more alkaline. According to the acid-ash hypothesis, exposure to acidic ash increases our susceptibility to illness and disease, whereas alkaline ash is considered protective.[ii] After being digested, carbohydrates and lipids turn into carbon dioxide gas and water. Acid produced during digestion is transported by blood to excretory organs like the lungs. Only alkaline blood is capable of transporting acids. Few foods will alter the alkalinity of blood resulting in acidosis, a condition of accumulation of acid in tissues.[iii] When our blood pH falls out of the normal range, it can be fatal if left untreated.

The strength, shape and stability of the human body are dependent on the musculoskeletal system. The most robust aspect of this unit is the underlying bony architecture. Bone is a modified form of connective tissue which is made of extracellular matrix, cells and fibers.

The high concentration of calcium and phosphate based minerals throughout the connective tissue is responsible for its hard calcified natur We should be able to "alkalize" our bodies and get healthier by consuming more alkaline foods. Some food categories are regarded as neutral, alkaline, or acidic. Fruits, nuts, legumes, and vegetables are examples of alkaline foods. The K/Na ratio is improved by an alkaline diet, which may also aid bone health and stop muscle wasting.

It's important to keep in mind that our bodies' pH varies significantly. There is no fixed amount; some areas are acidic while others are alkaline. Our stomach contains a lot of hydrochloric acid, making it extremely acidic with a pH of 2-3.5. This acidity is essential for the digestion of meals. Human blood, on the other hand, always has a pH between 7.36 and 7.44, making it somewhat alkaline.[iv] There is now good evidence to show that calcium is important not only to peak bone mass development but also in reducing bone loss in women who are greater than 5 year postmenopause. Vitamin D and calcium (and possibly vitamin K) are vital to fracture prevention in the elderly. Specific nutritional factors may improve calcium metabolism and bone formation.[v] Dietary supplementation with calcium and vitamin D is recommended for postmenopausal women Since poor bone health increases the risk of osteoporotic fracture, it is important to develop and maintain good skeletal health.

A reduction in bone mineral content is a characteristic of the degenerative bone disease osteoporosis. The two main determinants of adult bone health are (i) the maximum attainment of peak bone mass and (ii) the rate of bone loss that happens as people grow older. Both aspects are regulated by a combination of endogenous and exogenous factors. Although genetic influences are thought to account for up to three-quarters of the variance in bone mass, there is still scope for the modifiable factors (including nutrition) to play a significant impact. To decrease the risk of fracture after the age of 50 years, a woman's risk of dying from a hip fracture is equal to her lifetime risk of dying from breast cancer.[vi],[vii]

Almost one out of five patients with a hip fracture dies within six months and one out of four dies within a year.[viii],[ix] Many of these deaths are related to the immobility and increased metabolic demands caused by the fracture.[x] There may be additional health benefits from slightly higher levels of calcium intake, so an appropriate supplementary dose is 400-800 mg/day in order to achieve 1,200 mg/day as recommended by the National Institutes of Health.[xi],[xii] Very high levels of calcium supplementation have been associated with increased risks of kidney stones and myocardial infarction. [xiii] Therefore, calcium supplementation should achieve the recommended dietary allowance without providing excessive amounts. Magnesium is increasingly recognized as an important contributor to bone health.[xiv] Eight ounces of milk has approximately 25 mg of magnesium. The recommended dietary allowance for optimum health is 320-420 mg.[xv]

AIM AND OBJECTIVES:

1. To study the literature about nutritional requirements for the bone formation and its maintenence.
2. To study the literature about *Shimbi dhanya varga* according to *Ayurveda* and to establish them as a principle food for the bone health on the basis of their nutritive value.
3. To study the literature about pulses or legumes according to modern science.

MATERIL AND METHODS:

References were collected from *Ayurved* classics like *Charak Samhita*, *Sushrut Samhita*, *Bhavprakash* etc., books related to preventive and social medicine, national institute of nutrition, Hydrabad and various journals.

These references are analyzed logically and conclusion is drawn.

DISCUSSION:

The loss of bone mass indicates a *Vata* imbalance, according to *Ayurveda*. The sufferer should eat meals that balance the *vata dosha* and are high in calcium in order to balance their *vata*. Dietary requirements for calcium are based on the varying needs for bone maintenance and development throughout life. There is a brief discussion of numerous *Aahar vargas* in the *Ayurved Samhitas* (Naturally nourishing food). One of them is *Shimbi Varga* (Pulses). Most of the *dravyas* in *Shimbi Varga* are *Vatashamak*, and *Vata* is found in *Asthi Dhatu*, according to *Ayurveda*. *Asthi* (bone) is the primary site of calcium, according to modern science. *Shimbi varga* is rich in proteins, calcium, magnesium, and other nutrients that are important for healthy bones. These minerals are more efficient, readily available, and unaltered if we obtain them through diet. Therefore, including these pulses in a daily diet demonstrates a preventative and therapeutic aspect in illnesses caused by a calcium deficit. Modern science classifies *Shimbi Dhanya* as a kind of grammes of pulses. Red gramme (aadhaki), Bengal gramme (chanak), green gramme (mudga), black gramme (mash), and other types of pulses like lentil and peas (kalaya) are the most popular ones. They have a 20–25% protein content, which is twice as much as rice and three times as much as wheat.Pulses are rich in minerals like Ca, P, Mg etc. and vitamin B group vitamins like riboflavin, thiamine. Pulses contain maximum amount of proteins, Calcium, Phosphrous and other minerals and vitamins.[xvi]

Rasa, *Veerya*,*Vipak* ,*Guna*, *Doshghnata* and nutritional values of some pulses is given in table number 1 and 2 respectively.

Sr. no.	**Pulses**	***Rasa***	***Vipak***	***Veerya***	***Guna***	***Doshaghnata***
1.	*Mudga*	*Madhur Kashaya*	*katu*	*Sheeta*	*Laghu, ruksha*	*Kaphapittaghna,slightly vatakar*[xvii]
2.	*Kulathya*	*Kashaya*	*Amla*	*Ushna*	-	*Kaphavataghn, Raktapittkar*
3.	*Chanaka*	*Madhur, kashaya*	*Madhur*	*Sheeta*	*ruksha*	*Tridoshashamak with ghrita*[xviii]
4.	*Tila*	*Katu tikta kashaya, madhur*	*Madhur*	*Ushna*	*Snigdha*	*Vatahar, pittakar*[xix]
5.	*Masha*	*Madhur*	*Madhur*	*Ushna*	*Snigdha,Guru*	*Vatahar, kaphakar*[xx]
6.	*Aadhaki*	*Kashaya, madhur*	-	*Sheet*	*Ruksha, laghu, grahi.*	*Kaphapittanashak, Slightly vatakar*[xxi]
7.	*Makushth*	*Madhur*	*Madhur*	*Sheeta*	*Ruksha, grahi*	*Raktapittashamak*
8.	*Rajamash*	*Madhur Kashaya*	*Madhur*	-	*Ruksha, guru, vishada*	*Kaphahar, vatakar*
9.	*Masur*	*Madhur*	*Madhur*	*Sheet*	*Laghu, ruksha, grahi*	*Vatakar, Kaphapittashamak*[xxii]
10.	*Nishpav*	*Madhurkashaya*	*Madhur*	*Sheet*	*Guru, ruksha, sara, vidahi*	*Kaphaghnta*[xxiii]

Table no. 2: Nutritional values of pulses per 100gms in mg as per NIN, Hydrabad[xxiv]

Sr.no	Pulses	Ca (mg)	P(mg)	Mg (mg)	Iron (mg)	Protein (gm)	Carbs (gm)	Fats (gm)	Energy (kcal)
1.	*Mudga*	124	326	127	4.4	24	56.7	1.3	324
2.	*Kulathya*	287	311	156	6.77	22	57.2	0.5	321
3.	*Chanak*	202	312	119	4.6	17.1	60.9	5.3	360
4.	*Tila*	1450	629	351	14.55	17.73	23.45	49.67	573
5.	*Mash*	154	385	130	3.8	24	59.6	1.4	347
6.	*Aadhaki*	73	304	86	2.7	22.3	57.6	1.7	335
7.	*Makushta*	202	230	225	9.5	23.6	56.5	1.1	330
8.	*Rajamasha*	77	414	184	8.6	24.1	54.5	1	323
9.	*Masur*	69	293	80	7.58	25.1	59.0	0.7	343
10.	*Nishapava*	77	414		8.6	24.1	54	1	323

According to *Ayurveda*, the human body is a congenital balance of the three *doshas-dhatu—mala* and these three are primarily responsible of its growth. Disease occurs when there is an imbalance or disequilibrium in the *dosha-dhatu-mala's* functioning. There are seven *dhatus* in the human body. *Asthi* is the fifth *dhatu* among them. The association between *Asthi dhatu* and *Vata dosha*, or *Aashraya - Aashraye Bhava*, was discussed by *Aacharya Vagbhat*. The primary location of the *vata*, *Asthi*, is where the *vata dhatu* resides. Therefore, the *vata dosha* and the *asthi dhatu* have a mutual relationship. Both have an antagonistic relationships with one another. That is the factor which increases *Vata dosha* will decreases *Asthi dhatu* and vice versa.[xxv] Modern science states that bones (*Asthidhatu*) contain 99.9% of all calcium, making them the primary location of calcium in the body. According to modern science, pulses contain the highest amount of calcium, phosphorus, and proteins, all of which are beneficial for maintaining proper bone health. According to *Ayurveda*, symptoms of *Asthi dhatu kshaya* and symptoms of calcium insufficiency can be related.

According to the *Aashraya-Aashrayee bhava* concept, the majority of pulses (*mash, kulathya, mudga, chanaka, and tila*) are *vatashamak*, and *vatshamak dravyas* (drugs) are advantageous for *Asthi dhatu*, or they nourish *Asthi dhatu*.These *vatashamak* pulses contains comparatively high amount of Calcium and Phosphrous.[xxvi]

Therefore, they are advantageous in cases of calcium deficiency. On the other hand, pulses that are *Vatakara* also contain the highest levels of calcium and phosphorus. They are therefore beneficial for calcium deficiencies as well. Because of this, there will be minimal risk of deficiency problems if we obtain these minerals through our diet.

RESULT AND CONCLUSION:

Regular consumption of *Shimbidhanya* in dailly diet plays an important role in preventive and curative aspect in calcium related disorders. It's better to take all the neccessary nutrients for the bone metabolism from the natural sources inspite of taking these in the medicine form.

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