



ORIGINAL RESEARCH PAPER

Ayurveda

ROLE OF AYURVEDA IN UNDERSTANDING OF OSTEOPOROSIS (ASTHI KSHAYA) AND ITS PREVENTION

KEY WORDS: Osteoporosis (Asthi Kshaya), Osteopenia, Porous, Symptomatic relief, Side effects, Toxic effects, Adverse reaction.

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ABSTRACT

Osteoporosis (Asthi Kshaya), which literally means porous bone, is a disease in which the density and quality of bone are reduced. As the bones become more porous and fragile, the risk of fracture is greatly increased. The loss of bone occurs silently and progressively. Often there are no symptoms until the first fracture occurs. Osteopenia/Osteoporosis is a burning global problem which affects older population in both developed and developing countries. The allopathic treatment provides the symptomatic relief but the underlined pathology remains untreated due to absence of effective therapy and also giving rise to many side effects, toxic effects and adverse reactions. The treatment procedure described in Ayurveda focuses not only on drugs but also lifestyle modification thus having a holistic approach in its management. The present paper discusses the potentials and contribution of Ayurveda in prevention and management of Osteoporosis in present scenario.

INTRODUCTION

Osteoporosis (Asthi Kshaya) is a growing public health problem worldwide. It is the "Silent thief" which is often unrecognized until fracture. Osteoporosis is a systemic skeletal disease characterized by the low bone mass and microarchitectural deterioration of bone tissue, fragility and susceptibility to fracture[1]. The bone loss affects both cortical and trabecular bone, with trabecular bone loss more predominant in postmenopausal osteoporosis. Consequently, osteoporosis would lead to a bone with less tensile strength and significantly more susceptibility to fracture with less force.

It is one of the most major public health problems with a mortality of 30% in the first year. Worldwide osteoporosis causes more than 8.9 million fractures annually[2]. It affects both genders; however is more prevalent in women, particularly after the menopause. Osteoporosis affects 200 million women worldwide. Worldwide, 1 in 3 women and 1 in 5 men over age 50 will experience osteoporotic fracture. It is projected that more than about 50% of all the osteoporotic hip fractures will occur in Asia by the year 2050[3].

Both bone formation and resorption are governed by complex interactions of genetic, environmental, nutritional, age-related and lifestyle factors. Bones grow in size during the first two decades of life, with acceleration during adolescence, followed by a period of consolidation. Bone mass subsequently declines with ageing[4]. This is a universal phenomenon, occurring in both sexes. During the early menopausal in women, there is reduction in circulating estrogen. As a result, there is an increase in the rate of bone resorption, but not reformation. This creates imbalance and causes osteoporosis[5]. Although bone loss in women slows after the postmenopausal years, loss continues latter decades of life. In addition to hormonal changes, age-related bone loss is also due to reduced ability to utilize calcium, decreased vitamin D supply due to lower production and reduced absorption. All of these factors contribute to the increase with age in another hormone-(parathyroid hormone)[6]. When there is too much parathyroid hormone released in the body (hyperparathyroidism), bones release excessive calcium into the blood stream. As a direct result, bones lose their density and hardness.

Although traditionally regarded as a disease of women, osteoporosis also occurs frequently in men[7]. Men steadily lose bone mineral density with aging, and one in five men will suffer an osteoporotic fracture. Almost 30% of all hip fractures are in men, and the mortality following a hip fracture is substantially higher in men than in women. Men represent between 20% and 40% of all patients with each types of fracture that frequently affect the hip, vertebrae, forearm

(wrist), and humerus[8]. Bone loss in men has many causes. As in women, primary osteoporosis includes age-dependent and idiopathic osteoporosis. Age-related bone loss is dependent on estrogen production in both sexes. While estrogen is considered the female sex hormone, men also produce it [9].

AIMS AND OBJECTIVES

To explain the role of Nidana Parivarjana, Shodhana Therapy and Shamana Therapy enumerated in ancient Ayurvedic texts which will be beneficial in management of Osteoporosis (Asthi Kshaya).

MATERIALS AND METHODS

As the study is a review study, the available literature Samhitas, books are searched for the disease and analyzed to get a comprehensive concept in the management of Osteoporosis.

Electronic Database

PubMed, Google Scholar, PMC free Article, Web of Science, Scopus and etc. were searched.

Causes for Osteoporosis

As per medical and health experts, most cases of osteoporosis are caused due to ageing, body weight, lack of sex hormones after menopause, excessive smoking or drinking and reactions from certain medicines[10].

Recent research suggests that estrogen deficiency and reduced levels of other sex hormones may cause of osteoporosis in men. The main causes of secondary osteoporosis in men are excessive alcohol use, treatment with glucocorticoids, and hypogonadism, including that experienced by men receiving androgen deprivation therapy (ADT) for prostate cancer[11].

Basically, bones, being a living tissue, constantly keep on evolving through formation of new bone tissues and bone resorption takes place. However, when these two major functions suffer from imbalance, bones eventually undergo thinning and experience a loss in bone density.

Risk Factors

Factors that increase the risk for osteoporosis in both men and women include:

- **Having a Family History of Osteoporosis.** If your mother, father, or a sibling has been diagnosed with osteoporosis or has experienced broken bones from a minor injury, you are more likely to develop osteoporosis.
- **Lifestyle Factors.** These include:
 - o Smoking. People who smoke lose bone density faster than non-smokers[12].

- o Alcohol use. Heavy alcohol use can decrease bone formation, and it increases the risk of falling. Heavy alcohol use is more than 2 drinks a day for men and more than 1 drink a day for women. See pictures of standard alcoholic drinks.
- o Getting little or no exercise. Weight-bearing exercises—such as walking, jogging, stair climbing, dancing, or lifting weights—keep bones strong and healthy by working the muscles and bones against gravity. Exercise may improve your balance and decrease your risk of falling.
- o Being small-framed or thin. Thin people and those with small frames are more likely to develop osteoporosis. But being overweight puts women at risk for other serious medical conditions, including type 2 diabetes, high blood pressure, and coronary artery disease (CAD). For more information, see the topic Weight Management.
- o A diet low in foods containing calcium and vitamin D.
- **Having Certain Medical Conditions.** Some medical conditions, such as hyperthyroidism or hyperparathyroidism, put you at greater risk for osteoporosis.
- **Taking Certain Medicines.** Several medicines, such as corticosteroids used for long periods, cause bone thinning.
- **Having Certain Surgeries,** such as having your ovaries removed before menopause.

Diagnosis

Men and women over 60-years-old are at higher risk of osteoporosis than younger people. It is possible to have osteopenia or osteoporosis at earlier age. As osteoporosis has no obvious symptoms, important to go to the doctor for person with risk factors. By making positive lifestyle changes and appropriate treatment strategies, osteoporotic fractures can be prevented. may go for a bone mineral density (BMD) test.

World Health Organization has defined a number of threshold values (measurements) for osteoporosis. The reference measurement is derived from bone density measurements in a population of healthy young adults (called a T-score). Osteoporosis is diagnosed when a person's BMD is equal to or more than 2.5 standard deviation below this reference measurement.

Osteopenia is diagnosed when the measurement is between 1 and 2.5 standard deviation below the young adult reference measurement.

BMD Test

- 1) Normal: T-score of -1 or above.
- 2) Osteopenia: T-score lower than -1 and greater than -2.5
- 3) Osteoporosis: T-score of -2.5 or lower Severe.
- 4) Severe Osteoporosis: T-score of -2.5 or lower, and presence of at least one fragility fracture.

Ayurvedic Treatment and Management Approach

There are a number of treatment options available to manage its symptoms and improve your quality of life. These include:

- **Diet Therapy**–
 - Calcium rich nutrition should be ensured.
 - Along with it, diet rich in vitamin D as well as Vitamin D supplements are recommended.
- Consume healthy foods including nuts, dairy etc. in diet
- Langhanam (dieting) to reduce weight helps in reducing the burden on joints
- Avoid carbonated drinks, packaged foods and junk food
- **Hormone Replacement Therapy**– For preventing and treating osteoporosis in women, either estrogen alone or a combination of estrogen and progestin are used.
- **Medicines**– These include estrogen supplements, medicines that stop cells from breaking down bone, medicines to improve bone strength and reduce fractures, hormones to stop bone loss, etc.

Ayurveda recommends holistic treatment for osteoporosis which involves avoiding factors that lead to the vitiation of vata dosha. These include: nidana parivarjana (Avoidance of etiological factors), shodhana (Biopurification), shamana (Palliative treatment), oleation (snehan), sudation (swedan), oil bath and massage (abhyanga), enema (basti), oil purgation (sneha virechana), oiling the head (shiro basti), lubricating gargles, lubricating smoke, and lubricating nasal drops are some of the Ayurvedic treatment options for those suffering from osteoporosis.

According to Ayurveda, one can take certain measures to prevent osteoporosis. This includes a simple warm and light diet depending on the individual's prakriti or body constitution.

The right diet may help in reducing the buildup of ama and ensure the proper functioning of agni or metabolism.

Agni promotes the digestion, absorption, and assimilation of all the nutrients necessary for the formation and maintenance of healthy bone tissue.

Since this is a Vata disorder, Vata-pacifying dietary and lifestyle changes are usually the primary course of action.

Ayurveda recommends a diet consisting of meat soups, milk, meat cooked with healthy fats like sesame oil and ghee, juice of sour fruits, and fatty and salty food.

Calcium-containing foods like whole unprocessed milk, cooked green leafy vegetables such as kale or spinach, sesame seeds or tahini, sardines, and grains like amaranth are also good for those suffering from osteoporosis.

Regular self-massage (abhyanga) with warm cold-pressed sesame oil is excellent for reducing excess Vata buildup in the joints and bones. This helps in reducing Vata's catabolic activity on the bones.

Pouring a stream (dhara) of slightly warm liquids like oil (taila) and milk (kshira) is also beneficial.

Therapies:

- 1) **Nidana Parivarjana:** Avoid the excessive indulgence in etiological factors responsible for provocation of vata, vitiation of asthi, majjavahasrotas and also the psychic factors.
- 2) **Shodhana Therapy**- Shodhana is a purification therapy. The aggravated Doshas from the body are expelled out in this procedure, thereby eliminating the internal causative factors of the disease. Metabolic process causes generation of large quantities of toxic byproducts in the body. Toxins deposited in various tissues vitiate Dosha, Dhātu etc. and thereby causes diseases. Shodhana therapy removes toxins from body and restores the equilibrium of Dosha. Shodhana therapy consists of a three-stage purification process as follows:
 - i) Purva Karma – preparatory purification prior to the main purification.
 - ii) Panchadhana Karma – The main five purification methods (known as Panchakarma treatment).
 - iii) Paschat Karma – Post rejuvenation therapy.
- 3) **Shamana Therapy**– It is a palliative therapy to normalize the doshas rather than expelling them from the body. Shamana can be external treatment (Bahya samshamana) like application of herbal pastes, showering with medicinal liquids, tub bath in medicinal liquids, herbal oil massage, oil pooling over the head, oral rinsing, gargling, oil pulling etc. It can also be mild internal treatment (Aahyantara samshamana) like medicines that digest toxins, fat scraping procedures, aphrodisiacs, anti-toxins to nullify poisons, immune modulation, bulk promoting treatments, etc.

CONCLUSION

Osteoporosis being a multifactorial disorder needs a holistic approach to treat it. Prevention is better than cure. So, early diagnosis, prevention and intervention should be done in order to treat it easily. Ayurveda is a system of medicine which can prevent this by considering all the etiological factors involving in its pathogenesis. In order to reduce the probability of osteoporosis or any such bone problems, it is very important to follow a healthy Ayurvedic diet and lifestyle over the time.

REFERENCES

- 1) Role of Medicinal Plants and Natural Products on Osteoporotic Fracture Healing Mohd Azri Abd Jalil, Ahmad Nazrun Shuid, and Norliza Muhammad
- 2) Osteoporosis: An Ayurvedic Viewpoint Indumati Sharma and Virendra Singh
- 3) Ayurveda medicinal plants for Asthikshaya (Osteoporosis): A review Dipti, Richa Khandelwal, Ankita Aggarwal, Mohan Lal Jaiswal
- 4) Kumar DR. The Role Of Panchakarma Therapy In Musculoskeletal Disorders With Special Reference To Vatavyadhi. Global J Res Med Plants & Indigen Med 2013;2(1):23-29.
- 5) Consensus development conference: diagnosis, prophylaxis, and treatment of osteoporosis. Am J Med 1993;94:646-50.
- 6) "International osteoporosis foundation". Retrieved from <http://www.iofbonehealth.org/facts-statistics>. Accessed on 2015, 15 december
- 7). Cooper C, Campion G and Melton LJ 3rd, Hip fractures in the elderly: a world-wide projection, Osteoporos Int. 1992 Nov;2(6):285-9
- 8). Melton III LJ, Chrischilles EA, Cooper C, Lane AW Riggs BL, Perspective: How many women have osteoporosis?, J Bone Miner Res 1992;7:1005-10
- 9). Randell A, Sambrook PN, Nguyen TV, Lapsey H, Jones G, Kelly PJ and Eisman JA, Direct clinical and welfare costs of osteoporotic fractures in elderly men and women, Osteoporosis Int 1995;5:427-32
- 10). Reginster JY and Burlet N., Osteoporosis: A still increasing prevalence and Bone 2006;38:S4-S9
- 11). Kanis JA, Johnell O, De Laet C, Johansson H, Oden A, Delmas PD, Eisman JA, Fujiwara S, Garnero P, Kroger H, McCloskey EV, Mellstrom D, Melton LJ, Pols H, Reeve J, Silman A and Tenenhouse A, A meta-analysis of previous fracture and subsequent fracture risk, Bone 2004;35(2):375-82
- 12). Jasmine Jaypee et al., A Clinical Study on the role of Shatavari in minimizing the risk of Post-menopausal Osteoporosis, Department of Prasutitantra and Streeroga, 2006, IPGT and RA, GAU, Jamnagar