



Clinical Research

Effect of *Majja Basti* (therapeutic enema) and *Asthi Shrinkhala* (*Cissus quadrangularis*) in the management of Osteoporosis (*Asthi-Majjakshaya*)

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Abstract

Osteoporosis is a systemic disorder that affects entire skeleton, which is a metabolic bone disease characterized by low bone mass and microarchitectural deterioration of the skeleton, leading to enhanced bone fragility and a consequent increase in fracture risk. In Ayurveda, it can be correlated with *Asthi-Majjakshaya*. *Basti* (therapeutic enema) is the prime therapy for *Asthi* related diseases and *Asthi Shrinkhala* (*Cissus quadrangularis*) is the drug which is being used for strengthening of bone by traditional Vaidya since long. It has been selected for oral administration. In clinical trial, 12 patients treated with *Majja Basti* along with *Asthi Shrinkhala* pulp capsules and results are very encouraging.

Key words: *Asthi Shrinkhala*, *Asthi-Majjakshaya*, *Majja Basti*, Osteoporosis

Introduction

Osteoporosis is defined as a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture. Primary, i.e., involutonal, osteoporosis is clearly the most frequent and also clinically, the most important bone disease. Osteoporosis must therefore be viewed as the consequence of a specific imbalance of bone remodeling, which leads to net bone loss because formation of new bone by osteoblasts for several reasons does not match the extent of bone resorbed by osteoclast activity.

There are two major determinants of bone mass and mineral density in later life: (1) the extent of peak bone mass in early adulthood and (2) the rate of involutonal bone loss thereafter. Both the determinants are governed by complex interactions of genetic, environmental, nutritional, hormonal, age-related, and lifestyle factors. Bones grow in size during the first two decades of life, with acceleration during adolescence. This is followed by a period of consolidation. Peak adult bone mass is reached at about the age of 35 years for cortical bone and a little earlier for trabecular bone. Bone mass subsequently declines with aging.

This is a universal phenomenon, occurring in both sexes and in all races. At all ages, women have less bone mass than do men. With aging, this difference becomes more pronounced. With aging, there are changes seen in the microarchitecture of bone.^[1]

Ayurveda is one of the most ancient medical sciences of the world. It conceives and describes the basis and applied aspect of life process, health, disease and its management in terms of its own principles and approaches. There is no exact clinical entity mentioned in classics, like osteoporosis, but there are two conditions mentioned in Ayurveda which may be discussed in this regard. One is *Asthikshaya* and another is *Asthisaushirya*. *Asthisaushirya* is not mentioned as a separate condition but as a symptom of *Majjakshaya*, whereas *Asthikshaya* is mentioned as an independent condition. *Asthikshaya* is “decrease in the bone tissue” and *Asthisaushirya* means “porous bones”. Hemadri has commented on the word “*Saushirya*” as “*Sarandhratvam*” which means “with pores”. This condition is explained in the context of *Majjakshaya*. Osteoporosis means the decrease in the bone tissue. Moreover, there is another condition termed as osteopenia, which is a pre-stage (prodromal symptom) of osteoporosis in which there is also decrease in the bone mineral density. But decrease is not so remarkable as compared to osteoporosis. *Majja* is the next *Dhatu* of *Asthi*. Hence, in the process of *Kshaya*, *Majjakshaya* also occurs. Thus, *Majjakshaya* may take place after *Asthikshaya* as per the basic principles of *Anulomakshaya*. Since there is decrease of bone tissue in both the conditions, i.e., osteopenia and osteoporosis, it can be considered as *Asthi-Majjakshaya* because of its core of

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pathogenesis: 1) degeneration of bone tissue and 2) vitiation of *Vata*, the classical aspects of *Asthi-Majjakshaya* can be implemented in the disease osteoporosis.

Aims and Objectives

The aim of the present study was to assess the effect of *Majja Basti* and *Asthi Shrinkhala* pulp capsules in the management of osteoporosis (*Asthi-Majjakshaya*).

Materials and Methods

A total of 12 patients of osteoporosis and osteopenia (*Asthi-Majjakshaya*) were registered on the basis of symptomatology and relevant Bone Mineral Density (BMD) test in camps organized at IPGT and RA Hospital, Jamnagar, irrespective of their sex, religion, etc. Written consent was taken from each patient after giving him/her detailed information about the treatment. Ethical clearance was also obtained from the Institutional Ethics Committee.

Inclusion criteria

1. Osteoporotic patients of either sex, whose BMD (t-score) was equal to or less than 1.
2. Patients presenting with the classical symptoms of osteoporosis, with special reference to *Asthi-Majjakshaya*.
3. Patients between the age group of 30 and 70 year.

Exclusion criteria

1. Patients of age below 30 years and above 70 years.
2. Patients with BMD (t-score) above - 1.
3. Patients with rheumatoid arthritis, gouty arthritis, and longstanding systemic disorders were excluded.
4. Patients having diabetes mellitus (DM), uncontrolled hypertension (HTN), thyrotoxicosis, hyperparathyroidism, Addison's disease, Paget's disease, Cushing's syndrome, tuberculosis of bone, osteomalacia, chronic renal disease, hepatic and cardiac failure.

Criteria for diagnosis

The criteria of diagnosis was based on the signs and symptoms of osteoporosis and osteopenia (*Asthi-Majjakshaya*) and relevant physical examination carried out. In addition to this, BMD test was carried out in all the patients to confirm the diagnosis as well as to exclude the normal patients.

Totally, 12 patients fulfilling the criteria of diagnosis of osteoporosis (*Asthi-Majjakshaya*) were selected for the present study. They were treated with *Majja Basti* and *Asthi Shrinkhala* pulp capsule. Eight patients completed the treatment.

Drug, dose and duration

Majja Basti was administered for 16 days as a *Matra Basti* with 60 ml buffalo *Majja* (bone marrow of buffalo) along with *Asthi Shrinkhala* pulp powder filled in capsule (500 mg), two capsules three times daily for 3 months with milk.

The patients were advised to avoid the following: *Apathya* diet such as bitter, pungent, astringent taste dominant substances; dry, cold, light, etc. property predominant substances; *Shushkamamsa* (dry meat); *Shushkashaka* (dry vegetable); *Madya* (alcohol); excessive eating; fasting; heavy exercise; excessive

sexual intercourse; day sleep; night awakening; suppression of natural urges; medicines like corticosteroid, anticonvulsant, etc.; smoking and other etiological factors which cause aggravation of *Vata*.

Criteria for assessment

Improvement in the patients was assessed on the basis of relief in signs and symptoms of the disease. All the signs and symptoms were given scoring depending upon their severity to assess the effect of the treatment objectively.

Parameters of the study: Subjective parameters

1. *Shoola* (Pain)
 - Grade 0 – No pain
 - Grade 1 – Mild pain
 - Grade 2 – Discomforting pain
 - Grade 3 – Distressing pain
 - Grade 4 – Horrible
2. *Sparshasahyata* (Tenderness)
 - Grade 0 – No tenderness
 - Grade 1 – Mild tenderness without any sudden response on pressure
 - Grade 2 – Wincing of face on pressure
 - Grade 3 – Wincing of face and withdrawal of the affected part on pressure
 - Grade 4 – Resist touch due to tenderness
3. *Dourbalya* (General debility)
 - Grade 0 – No *Dourbalya*
 - Grade 1 – Not able to perform strenuous activity
 - Grade 2 – Not able to perform moderate activity
 - Grade 3 – Cannot perform moderate activity but can perform mild activity without any difficulty
 - Grade 4 – Even mild activities cannot be performed

Total score: BT AT

Objective parameter

Bone mineral density (t-score): WHO criteria for assessing osteoporosis.

Normal – “t” score greater than - 1; osteopenia – “t” score between - 1 and - 2.5; osteoporosis – “t” score less than or equal to - 2.5 and severe osteoporosis – “t” score less than - 2.5 with fracture.

Overall effect of therapy

Marked improvement: >75–100% improvement
 Moderate improvement: >50 to <75% improvement
 Mild improvement: >25 to <50% improvement
 Poor improvement: less than 25% improvement

Observations and Results

Out of 12 patients of osteoporosis selected (*Asthi-Majjakshaya*), 66.67% belonged to 51–60 years of age, 58.33% were males and 41.67% were females, 41.67% belonged to lower socioeconomic status, 33.33% patients were having the habit of tobacco chewing, 83.33% patients were having disease chronicity between 1 and 5 years, 66.67% patients were having *Krurakoshtha*, family history was present in 8.33% of patients, and 50% patients were having *Avara Vyayama Shakti*. Maximum, i.e., 66.67% patients, were taking *Ruksha Ahara*, followed by 33.33% taking *Seeta Ahara*, and 50% patients were taking *Laghu Ahara* and

Vistambhi Ahara each. 83.33% patients of this series had history of *Diva-Swapna* (day sleep), whereas 74.44% patients had the history of *Ratrijagarana* (insomnia), and *Vega-Sandharana* (suppressed natural urge) and *Ati-Sankshobha* were found in 41.67% and 50% patients, respectively, whereas *Ati Vyayama* (>8 hours) was found in 33.33% patients. Also, 66.67% patients of this series reported to have *Bhaya* (fear) as one of the causes of their disease, and *Shoka* (grief) and *Chinta* (anxiety) were found in 24.44% and 50% patients, respectively.

Overall effect of therapy

Marked improvement and mild improvement were found in 12.50% patients each, whereas moderate improvement was found in 75% patients, and no patient remained unchanged in this study.

Discussion

Vitiation of *Vata* and deterioration of all *Dhatu* is a natural phenomenon occur in old age. Provocation of *Vata* occurs by two processes, either *Samtarpana* or *Apatarpana*. Provocation of *Vata* caused by *Apatarpan* is due to taking diet and *Vihara* (living habits) which vitiate *Vata* or due to *Jarajanya* (old age). *Samtarpana* is due to creating *Margavarodha* causing vitiation of *Vata*. Reviewing all the available literature related to *Asthidhatu* and *Majja Dhatu*, the final diagnosis of the disease was given as *Asthisaushirya*.

Vata Dosha contributes largely for occurrence of *Asthi* related diseases because of unique relationship of *Vata* and *Asthi*. *Gambhira Dhatu* (deep-seated tissue), *Syabhava Balapravritta Vyadhi* (natural phenomenon due to old age) and *Bhedawastha* (complicated stage) make this disease *Asadhya* (incurable). Management of established bone porosity is difficult. Hence, prevention of the condition becomes all important. This disease can become *Yapya* by intervention at proper level, followed with *Pathyapathaya*. Prevention of *Asthisaushirya* should be commenced at the level of *Asthi-Majjakshaya*, which is precursor of *Asthisaushirya* (bone porosity).

Effect of therapy on Asthikshayatmaka Lakshana

Effect on pain

Acharya Sushruta said that pain is the cardinal symptom of vitiated *Vata Dosha*. Pain does not arise in the absence of *Vata*.^[2] Therefore, a drug can relieve pain only by pacifying vitiated *Vata Dosha*. In the present study, 76.19% relief was found in pain which was statistically highly significant ($P < 0.001$) [Table 1]. Acharya charak said *Basti* as the supreme therapy for alleviating *vata*.^[3] Moreover, the constituent ingredients, like *Majja*, have *Ushna Virya*, *Guru Vipaka* and potent *Vatahara* properties. *Asthishrinkhala* also has analgesic and anti-inflammatory property.^[4] By virtue of *Ushna Virya*, it pacifies *Vata* and provides relief.

Effect on tenderness

In the present study, treatment with *Majja Basti* along with *Asthi Shrinkhala* showed better results (75%), which was statistically highly significant ($P < 0.001$) [Table 1]. It is the symptom mostly related with the accumulation of *Ama* and involvement of *Vatadosa*. Acharya Sushruta mentioned tenderness as one of the symptoms in the *Ama Shopha*.^[5] Inflammation and swelling in

Table 1: Effect of therapy on the subjective and objective parameters of the eight patients of osteoporosis (Asthi-Majjakshaya)

Parameters	Mean \pm SD		Change		“t”
	BT	AT	Mean	%	
Pain	2.625 \pm 0.744	0.625 \pm 0.518	2.00	76.19	7.483**
Tenderness	1.500 \pm 0.756	0.375 \pm 0.518	1.125	75	4.965**
General debility	1.372 \pm 0.744	0.744 \pm 0.518	1.00	72.72	5.292**
BMD test (t-score)	-2.751 \pm 0.583	-1.899 \pm 0.372	-0.852	30.98	-5.543**

** $P < 0.001$ shows statistically highly significant change

the joint and bone tissue are due to involvement of *Pitta* and *Kaphadosa*. Hence, an imbalance of *Tridosha* is seen. Acharya Sushruta mentioned *Basti* as *Tridoshagna*.^[6] Equating *Amadosa* to free radicals, it is proved that *Asthi Shrinkhala* shows significant inhibition of DPPH [Di(phenyl)-(2,4,6-trinitrophenyl) iminoazanium] free radical formation and superoxide radical production,^[7] thereby scavenging the free radicals.

Effect on general debility

In the present study, treatment with *Majja Basti* along with *Asthi Shrinkhala* showed better results (72.72%), which was statistically highly significant ($P < 0.001$) [Table 1]. Osteoporosis (*Asthi-Majjakshaya*) is a disease of elderly people, except in cases associated with malnutrition. Generally, with increase in age, there is depletion of *Dhatu*, *Bala*, etc.^[8] This phase is also recognized with hyperactive *Vatadosha* resulting from *Dhatukshaya*. Treating debility to certain extent can control the process of osteoporosis (*Asthi-Majjakshaya*). *Majja* has the properties of increasing *Bala*, *Shukra*, *Rasa*, *Shleshma*, *Meda* and *Majja*. It has been described to rejuvenate especially *Asthi Dhatu*.^[9] Moreover, *Asthi Shrinkhala* is a tissue-specific anabolic drug for bony tissue,^[10-12] and this way it prevents further degeneration.

Effect on therapy on BMD

In the present study, BMD (t-score) increased by 30.98% after completion of duration of treatment, which was statistically highly significant ($P < 0.001$) [Table 1]. This indicates that the drugs enhance bone formation as well as decrease bone resorption. Both the drugs act in both the ways and balance bone remodeling and hence can prevent bone loss and help in increasing the bone density. This test is a direct indication of depletion of *Asthi Dhatu*. *Majja*, by virtue of its *Asthi Balakrita* properties, checks the osteoporosis (*Asthi-Majjakshaya*).

Asthi Shrinkhala has been described as *Asthiyuka* which means that it helps or promotes or maintains the conjugation of *Asthi Dhatu*. *Majja* has a significant effect on reducing the *Asthi-Majjakshaya* (osteoporosis), whereas *Asthi Shrinkhala* inhibits further degeneration. Researches prove that *Asthi Shrinkhala*^[3] has an active ingredient known as ketosterone. On this basis, it performs multiple actions as follows.

- 1) It acts as an antagonist to the glucocorticoid receptor and promotes good bone health.
- 2) It shows anabolic steroid properties for healing of fracture.
- 3) It increases intramuscular

creatinine levels. 4) It blocks the muscle damaging effect of cortisol and leads to the formation of new muscles. 5) It shows significant inhibition of DPPH free radical formation, superoxide radical production and lipid peroxide production in erythrocytes. 6) It shows sedative effect on the central nervous system. 7) It protects gastric mucosa against ulceration by its antisecretory and cytoprotective properties. 8) It mobilizes fibroblast and chondroblasts to an injured tissue and enhances regeneration. 9) It is helpful in the back and spine problems.

Moreover, it has been reported that *Cissus quadrangularis* extract is used as a dietary supplement or pharmaceutical composition. It is used to prevent and treat osteo-health related disorders and diseases.^[13]

Apart from the statistical analysis, some interesting clinical effects of the therapy observed in individuals are reported below.

In the present study, two patients had associated complaints of chronic neck pain and stiffness; who were using cervical collar for a prolonged time. These patients have shown remarkable results in symptomatic relief from pain and stiffness after 16 days of administration of *Majja Basti*, and as a result they stopped wearing their cervical collar permanently.

Conclusion

From the above study, it is observed that effects of *Majja Basti* along with *Asthi Shrinkhala* are encouraging in the management of osteoporosis (*Asthi-Majjakshaya*) and it also improves the general health of the patients.

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हिन्दी सारांश

आस्टियोपोरोसिस-अस्थि मज्जा क्षयगत रोग में मज्जा बस्ति और अस्थि-श्रृंखला के प्रभाव का अध्ययन

अजय कुमार गुप्ता, नेहल शाह, ए. बी. ठाकर

आस्टियोपोरोसिस एक सार्वदैहिक विकृति है जो पूरे शरीर की अस्थियों को प्रभावित करता है। यह चयापचयात्मक व्याधि है जिसमें अस्थियों का घनत्व कम हो जाता है और अस्थियाँ गलने लगती हैं, एवं उनके टूटने के अवसर अधिक हो जाते हैं। आयुर्वेद में इसे अस्थि मज्जा क्षय कह सकते हैं। बस्ति, अस्थिगत व्याधि के लिए एक उचित चिकित्सा है और अस्थि-श्रृंखला का प्रयोग भी अस्थियों की दृढ़ता हेतु परम्परागत वैद्यों द्वारा किया जाता रहा है। इस व्याधि के रूग्णों की अस्थियों का घनत्व मापकर इस व्याधि की चिकित्सा हेतु मज्जा बस्ति ६० मि.ली. भैंस की मज्जा (Bone marrow) १६ दिन तक और अस्थि श्रृंखला चूर्ण कैप्सुल में भरकर १ ग्राम ३ बार दूध के साथ ३ माह तक दिया गया। चिकित्सा के पश्चात् शूल (७६.१९%), स्पर्शासह्यता (७५%) और दौर्बल्य (७२.७२%) लक्षणों में सांख्यिकीय दृष्टि से सार्थक लाभ पाया गया। साथ ही अस्थिघनत्व (t-score) में भी ३०.९८ % की सार्थक वृद्धि हुई।