A STUDY ON SAMANYAM VRUDDHI KARANAM WITH REFERENCE TO MUKTASHUKTI PISHTI IN ASTHI KSHAYA

Arpana PV1, MG.Yaligar2
1Final year Post Graduate Scholar, 2Associate Professor, Department of Samhit Siddhanta, SDM College of Ayurveda & Hospital, Hassan, Karnataka, India.

ABSTRACT

Asthi is a state where the functional capacity of Asthi (bone) is compromised due to the decrease in its Guna (properties) Karma (function) and structure of Asthi. Asthikshaya is correlated to osteopenia/osteoporosis in contemporary science. Osteopenia/osteoporosis is a major global health problem affecting females at an average age of 50 making their bones susceptible to fracture. 1 out of 3 females in India suffer from osteopenia/osteoporosis making it a burning problem in present era. This has led to tremendous interest in Ayurvedic alternatives. Ayurveda states decrease of any entity in the body should be increased by administering similar entity by the means of food or activity. This treatment is based on Samanya (similarity) where Samanya is the cause for Vruddhi (increase in its properties and functional capacity). 30 female subjects between the age of 45 to 65, were included in a single group study by purposive consecutive sampling method, were administered with Mukta shukti pishhti 250mg 2 capsules per day with lukewarm water before food for a period of 2 months. Subjects were assessed pre intervention, during and post intervention. Obtained results were subjected to appropriate statistical analysis to see the significance. By the result it is noted that Mukta shukti is Gunasamanya (Sthira, Shula, Katin, and Sandragunas) to Asthi thus increases Asthi in Asthikshaya with improvement in Kesha (hair fall), Nakha (breakage of nails) Dantashadana (loosening of teeth), Shrama (tiredness) and Asthitoda (pain in bony area) and statistically significant.

KEYWORDS: Asthikshaya, Samanya, Vraddhikaranam, Mukta shukti pishhti, BMD test.

INTRODUCTION

Asthi is the bone tissue which forms the skeletal framework of the body and supports the body. Compactness of bone tissue is essential for supporting the body by its skeletal framework, transmitting body weight and providing loco motor function. An individual with an excellence of bone tissue is characterized with prominent and well-formed bony parts as well as teeth and nails. When bone tissue becomes inferior in excellence, these qualities are compromised.

Asthikshaya is understood as decrease in the Poshakamsha (nutrient supply) to Asthidhatu leading to Kshaya of Asthidhatu and its functions along with its Upadhatu (structures nourished by Asthi) and Mala (by products). As the body is made of Panchmahabhuta, we understand that Asthi is predominant of Prthvi mahabhuta. In Asthikshaya there is quantitative and qualitative decrease of Prithvimahabhuta at the level of Asthi. The Dehadharana Shakti (ability to support body) of Asthi is decreased leading to weakness in the bones due to loss of its Sthira (sturdy) Sandra (rough) Shula (thick) and Songhata (compact) properties. Vataavruddhi causes Asthi kshaya and in Prakopavastha leading to Asthi Susheerata which can be correlated to Osteoporosis which is practically seen in old age and under nourished subjects.

Osteoporosis is a skeletal disorder characterized by compromised bone strength, predisposing bone to an increased risk of fracture. Osteoporosis is the commonest of the metabolic bone diseases and is an important cause of morbidity in elderly subjects. Women over the age of 50 have the greatest risk of developing osteoporosis due to fall in ovarian estrogen production post menopause.1 Out of 3 females and 1 out of 8 males in India suffer from osteoporosis, making India one of the largest affected countries in the world. This has led to tremendous interest in the Ayurvedic alternatives.

Samanya and Vishesha (dissimilarity) Siddhanta (doctrine) is one which forms the basis of all treatments. Samanya and Vishesha contribute for the increase and decrease of entities on the domains of Dravya (physical entity), Guna (properties) and Karma (action) respectively when applied on human body. The selection of a drug for treatment according to its Guna and karma is based on the principle of Samanya and Vishesha and hence is placed first among the Shad karanas. This shows the importance of sound knowledge of treatment principle before starting the treatment. Therefore a Dravya which can cause Vruddhi of Asthidhatu based on Samanyawas evaluated. Mukta shukti (CaCO3) identified as Pinctada imbricata fucata possesses Katu rasa, Madhuravipaka, Snigdhaguna and Sheetawaerya having Vata pittagadhna, Vatahara, Hridya property is predominant in Prthvi mahabhuta. As Asthi is predominant in Prithvimahabhuta, the drug was intended to cause increase in Asthi Dhatu because of its Samanata based on Panchamahabhuta Sanghatana.
MATERIALS AND METHODS

Source of data
30 female subjects were selected from outpatient department of S.D.M. college of Ayurveda and Hospital, Hassan and Chikamagaluru.

Method of collection of data
- A special proforma was prepared with all points of history taking related to Asthikshaya, and symptoms of Asthikshaya.
- BMD Test was carried out with a Peripheral Bone Densitometer conducting regular camps at SDM Hospital of Ayurveda, Hassan.

Study design
Selected subjects were included in a single group study by purposive consecutive sampling method. Subjects were assessed pre intervention and on 15th day, 30th day, 45th day and 60th day post intervention.

Diagnostic criteria21-25
- Increased hair fall/thinning of hair
- Easy breakage of nails
- Cracking of teeth
- Falling of teeth
- Tiredness
- Dryness of the body
- Pain in bony area

Such patients were subjected to BMD Test to evaluate Asthi Susheerata.

Inclusion criteria
- Female patients above 45 years and below 65 years.
- With Asthi kshaya Lakshana.
- T-Score in DXA Scan below -1.
- Willing to participate in the research.

Exclusion criteria26
- History of Hypoparathyroidism/Hyper parathyroidism.
- History of Hypothyroidism/Hyper thyroidism
- History of Malabsorption syndrome.
- History of Any metabolic bone disease e.g. Paget's disease, Psycho-Neuro-Endocrinal disorder, Rheumatoid arthritis, Osteomalacia, Dysosteo-genesisism perfacta and Marfan's syndrome, Cushing's syndrome.
- History of Chronic liver diseases, Chronic renal failure.
- History of Organ transplantation and evidence of malignancy.
- History of Alcoholics/drug abusers.
- History of CHD or any diagnosed case of Heart Diseases.
- History of Diabetes mellitus
- History of Patient under any drug which is known to affect bone metabolism - calcitonin, Vit. D and corticosteroids for more than 3 month.

Investigations
- BMD T-Score

Intervention
- Medicine: Muktasukti Pishti
- Source of Drug: Sri Dharmasthala Manjunatheshwara Pharmacy Udupi.
- Drug Authentication: SDMRAAS. Udupi.
- Contents of the medicine

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Sanskrit Name</th>
<th>Zoological Name</th>
<th>Part Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Muktasukti</td>
<td>Pinctada imbricata fucata</td>
<td>Whole pearl oyster</td>
</tr>
</tbody>
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- Method of preparation: As stated in AFI Part I, page no 223
- Packaging and Labeling
250mg Muktashuktipishti filled in hard gelatin capsule and packed in numbers of 30 in small plastic containers under all aseptic precautions and labelled.
- Dosage: 250 mg two capsules twice a day before food.
- Duration of medicine: 2 months

Study duration
8 weeks study duration with a follow up on 15th day, 30th day, 45th day and 60th day.

Assessment criteria
Effect of treatment will be assessed on -

Subjective Criteria
- Increased hair fall/thinning of hair
- Easy breakage of nails
- Cracks or falling of teeth
- Tiredness
- Dryness of the body
- Pain in bony area

Objective Criteria
- Bone mineral density Test

Statistical analysis
The data collected during the study was tabulated and analyzed with SPSS version 20 by applying following statistical tests. The changes obtained with P ≤ 0.05 and P ≤ 0.01 for post hoc test after applying Bonferroni correction was considered statistically significant.
- Cochran Q Test
- McNemar Test
- Friedman’s Two Way Analysis of Variance by Rank
- Wilcoxon Signed Rank Test
- Paired T Test

OBSERVATION AND RESULTS

Drop outs - During the course of treatment, the subjects who did not turn up for follow up at given time were dropped out from the study. Total 9 dropouts were there in the present study out of the 30 subjects taken up for research work.

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Nakhashadana, Chaladanta and Rukshangha had no significant result clinically and statistically hence not discussed here.

**Subjective parameters within the group**

- **Keshashadana (Shedding excessive hair)**
  
  The symptom shedding excessive hair reduced statistically as assessed by Cochran Q and Mc Nemar test. 16 of 21 subjects had this complaint BT out of which 15 subjects got significant reduction in shedding excessive hair (Cochran’s Q = 28.444, p = 0.000).

- **Keshashadana (Thinning of hair)**
  
  The symptom thinning of hair reduced statistically as assessed by Cochran Q and Mc Nemar test. 8 of 21 subjects had this complaint BT out of which 4 subjects got significant reduction in thinning of hair (Cochran’s Q = 13.333, p = 0.010).

- **Keshashadana (Shedding of hair with root attached)**
  
  The symptom shedding of hair with root attached reduced statistically as assessed by Cochran Q and Mc Nemar test. 15 of 21 subjects had this complaint BT out of which 11 subjects got significant reduction in shedding of hair with root attached (Cochran’s Q = 30.933, p = 0.000).

- **Nakhashadana (Breakage of nails)**
  
  There was no statistically significant difference in symptom Nakhashadana as assessed by Cochran’s Q test p ≤ 0.05, but clinically only one subject had relief from the symptom Nakhashadana out of 3 subjects who had this complaint BT.

- **Dantashadana (Loosening of teeth)**
  
  There was no statistically significant difference in symptom Chala danta as assessed by Cochran’s Q test p ≤ 0.05, but clinically both the subjects had relief from the symptom Chaladanta who had this complaint BT.

- **Dantashadana (Falling of teeth)**
  
  The symptom falling of teeth was not appreciated by subjects in the course of treatment (which was seen earlier) and was statistically significant as assessed by Cochran Q and McNemar test. 3 of 21 subjects had this complaint BT out of which all 3 subjects got significant relief from falling of teeth (Cochran’s Q = 12.000, p = 0.017).

- **Daihikashrama (Physical tiredness)**
  
  The symptom Daihikashrama reduced statistically as assessed by Cochran Q and McNemar test. 12 of 21 subjects had this complaint BT out of which 10 subjects got significant reduction in Daihikashrama (Cochran’s Q = 22.143, p = 0.000).

- **Manasikashrama (Mental tiredness)**
  
  The symptom Manasikashrama reduced statistically as assessed by Cochran Q and McNemar test. 7 of 21 subjects had this complaint BT out of which 6 subjects got significant reduction in Manasikashrama (Cochran’s Q = 12.471, p = 0.014).

- **Asthitoda (Pain in bony area)**
  
  The symptom Asthitoda reduced statistically as assessed by Friedmann’s and Wilcoxon Signed Rank test. Out of 21 patients 15 patients got significant reduction in Asthitoda and in 6 patients there was neither increase nor decrease in pain (x² = 42.301, p = 0.000).

**Objective Parameter**

- **BMD t-score**
  
  There was no statistically significant difference in BMD T-Score before and after treatment (p ≤ 0.05) as determined by Paired T test but there was difference in Mean (0.1419) in BMD T score before and after treatment with 6.7% of percentage of significance. This difference in mean shows that there was improvement clinically in BMD T-Score in subjects before and after treatment but was not proven statistically.

**DISCUSSION**

**Subjective Parameters**

Kesha, Nakha and Danta are the Mala of Asthi. The Panchabhoutrik composition (i.e., Prithvi) of Asthi can be attributed to Kesha, Nakha and Danta also, thus during Kshayaavastha the decrease of Shhira, Sandra, Katina and Sthulagunas of Prithvi at the level of Kesha, Nakha and Danta was also observed through the symptoms increased hair fall, thinning of hair and shedding of hair with root attached, loosening of teeth, falling of teeth and breakage of nails. There was significant improvement seen in Keshashadana nakhashadana and Dantashadana and statistically proven as stated above after administration of Muktashuktipishti. We can assume that there is an increase of Shhira, Sandra, Katina and Sthulaguna which are nothing but the Parthivagunas at the level of Kesha, Nakha and Danta. We can interpret that, the Parthivaamsha of Muktashuktipishti is the Karana for Vruddhi of Kesha there by maintaining the thickness of hair and decreasing the hair fall by making the hair roots stronger, strengthening the nail bed and roots of tooth. Nourishment to Kesha, Nakha and Danta is improved only when Asthi is in its normalcy. Thus we can conclude Muktashuktipishti is Gunatahasamanya to Asthi and thus leads to Vruddhi in Asthikshaya.

Shrama and Asthitoda is the outcome of decreased functional capacity of Asthi which is reflected by decrease in Bala, Sthairya, Upachaya and Sanghata function leading to fatigue. There was significant improvement seen in Shrama and Asthitoda and statistically proven as stated above after administration of Muktashuktipishti. We can assume that there is an increase of Shhira, Sandra, Katina and Sthulaguna which are nothing but the Parthivagunas in the Asthi. We can interpret that, the Parthivaamsha of Muktashuktipishti is the Karana for Vruddhi of Parthivaamsha in Asthi leading to increased functional capacity of Asthi. Thus we can conclude Muktashuktipishti is Gunatahasamanya to Asthi and thus leads to Vruddhi in Asthikshaya.

**Objective Parameter**

- **BMD t-score**
  
  BMD T-Score is the value which indicates the amount of bone tissue in a certain volume of bone. Reduction in BMD T-score (≤ -1) can be related to the structural decrease in Asthidhatu leading to a porous bone susceptible to fracture, indicating decrease in Pruthvi mahabhuta. Increase in BMD T-Score in 6.7% of subjects.
(not statistically significant) indicates the amount of increase in bone tissue in that area, thereby reduction of porosity. As there is no statistically significant Dravyaguna (BMD T-score) seen in subjects, we can interpret that Dravyasamanya is not appreciated in Asthi statistically but appreciated clinically on administration of Mukta.

Out of 6 criteria of subjective assessment for which statistics was computed 4 criterias (Keshashadana, Dantashadana, Shrama, Asthitoda) were proven to be significant clinically and statistically, 2 criterias (Nakhashadana, Chaladanda) were clinically significant but not proven statistically. The probable reason for this result was discussed on the basis of Gunas samanya of Mukta and Asthi. The objective criteria (BMD T-Score) was clinically significant but not proven statistically. The probable reason for this result was discussed on the basis of Dravya samanya of Mukta and Asthi.

Considering the above results we can interpret that Mukta is Gunasamanya to Asthi and thus leads to Vruddhi in Asthikshaya.

**Discussion on mode of action of Mukta**

Mukta is the outer hard covering shell of Mukta. This provides Mukta protection, nutrition and structural frame for its survival and hence called by the synonyms Muktagriha, Muktamata and Mukhtikamandira. Mukta is obtained from sea hence also called as Jalashukta.27-29 Thus Prithvi and Jalamahabhuta can be attributed to it.

Mukta is having Katursa, Laghuaguna which can be attributed to Vayumahabhuta. Considering the Karma - Vatapitahara, Vedananaha, Pushikara, Balakaravishnya, Chakushya, Hridya and Vishahara we can attribute these karma to Madhuvipaka, Shitavirya and Shitasnigdhaguna which are the properties of Prithvi and Jalamahabhuta.

Mukta when prepared into bhasma, the therapeutic action is potentified. The active ingredients are broken down into smaller particles thus increasing the bioavailability of the drug. Also smaller dosage of the Bhasma is potent enough when administered for therapeutic usage than its original form. The time taken for the action of Bhasma is lesser than its original form. Bhavana with Nimbuswarasa increases the metabolism of the drug by its action on Agni.

Thus Mukta is having the properties Katurasa, Madhuvipaka, Shitavirya, Laghusnigdhaguna is considered to be predominant in Prathvi-mahabhuta. On administration of Mukta pishii 500 mg/day over a period of two months in Asthikshaya subjects there was statistically significant improvement seen in subjective assessment criteria. We can assume that there is an increase of Sithira, Sandra, Katina and Sthulaguna which are nothing but the Parthivaagunas in the Asthi. We can interpret that, the Parthivaamsha of Mukta is the Karana for Vruddhi of Gunasparthivaamsha in Asthi leading to increased functional capacity of Asthi. Hence we can understand Mukta is Samanya Gunabhuyishta to Asthi. Thus we can conclude Mukta is Gunasamanya to Asthi and thus leads to Vruddhi in Asthikshaya.

**Mukta is used in Traditional System of Indian Medicine in different forms in various disorders. Mukta Bhasma is used as an ingredient in preparation of tooth powder. It is used as Calcium supplements in both humans and animals.**30

**CONCLUSION**

Samanya is the cause for Vruddhi (increase) when applied on the domains of Dravyaguna and karma as Aahara or Vihara, but it’s not the only cause. Dravyasamanya is observed when there is quantitative increase of the biological entity when an exactly similar Dravya is administered. Gunasamanya is observed when there is increase in properties of the biological entity when Dravya with similar properties is administered.

Asthikshaya is understood in terms of decrease either in its Gunakarma or decrease in Asthi as a Dravya (structural decrease). Kshaya of Asthi is reflected in three ways - through Vikaras in its Upadhatu and mala, through decrease in its functional capacity and through structural decrease. Keshashadana, Shrana and Ashtituda are the commonly seen symptoms in Asthikshaya. The contemporary parallel term for Asthikshaya is osteoporosis, as all the symptoms of Asthikshaya is seen in osteoporosis.

Mukta is having Katu rasa, Madhuvipaka, Laghusnigdhaguna, Vatapitahara, Vedananaha, Pushikara, Balakara, Dravyaguna which are the properties of Prithvi and Jalamahabhuta.

The Pancamahama bhutasanghatana and the Gunas of Asthi can be attributed even to its Upadhatu and mala also. Keshashadana, Nakkhashadana, Chaladanda and Dantashadana are the consequence of decrease in Sthira, Sandra, Kathina and Sthula properties of Asthi.

The Parthivaamsha of Mukta is the Karana for Vruddhi of Asthi thus increasing the nourishment to Keshana and Danta there by maintaining the thickness and firmness of the hair nails teeth and making the roots of the hair nails teeth stronger. Shrama and Ashtitoda is the consequence of decreased functional capacity of Asthi. The Parthivaamsha of Mukta is the Karana for Vruddhi of Asthi thus increasing Sthira, Sandra, Kathina and Sthula properties. Mukta is predominant in Prathvimahabhuta.

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*Address for correspondence
Dr PV Arpana
Final year Post Graduate Scholar, Department of Samhita Siddhanta, SDM College of Ayurveda & Hospital, Hassan, Karnataka.
Ph: 07411740024
Email: drarpavana226@gmail.com

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