

Research Article

Overview of the Sudhavargeeya dravya with respect to Calcium

Rupali Dale^{1,*}, Sunil C. Bakare²

¹P. G. Scholar, Professor and HOD²

Department of Rasashastra and Bhaishajya kalpana^{1,2}

^{1,2}Yashwant Ayurvedic College P. G. Training & Research Centre, Kolhapur Maharashtra, India-416 114

* **Corresponding Author:** Dr. Rupali Dale, E-mail: rupalimargale1984@gmail.com

Article Received on: 10/11/2021 Accepted on: 16/12/2021 Published on: 31/12/2021

ABSTRACT:

Rasashastra is an integral part of Ayurveda that deals with mercury, metals, minerals and animal origin drugs having therapeutic and alchemical importance. Use of mineral and metallic preparations for health care is a unique feature of Rasashastra. The group of Sudhavarga dravya is that which has high calcium contain in them. Calcium is the most abundant mineral in human body, which plays vital role in the human physiology. Though the mention of therapeutic utility of calcium compounds in Ayurveda dates back to samhita period; the references of these compounds are found scattered under different context in literature of Samhitas and Rasashastra. For the first time all calcium compounds were exclusively categorized in a single group based on their chemical composition as “Sudhavarga Vijnaneeyam” by Rasamrutam the text of 20th century. Sudhavarga dravya gained therapeutic importance in clinical practice.

KEY WORDS: Sudhavarga dravya, Calcium compounds

INTRODUCTION:

The drug which are available in Ayurvedic system of medicine are obtained from either animal, herbal or mineral form. There are many modalities available in Ayurveda are plays important role in treatment of various disease. Sudha means nectar, honey, comfort, water, milk, good drink, beverage of gods etc¹. In Charaka and Shushruta Samhita Sudha has been included under Parthiva dravya. Both Rasaratnakara and Rasanarva have enumerated in Shukla varga. ² Rasamruta has included these drug under “Sudha vijnaneeyam” based on chemical composition. ³

Calcium is an essential nutrient for the human body. Calcium is key components that mediates muscle contraction, exocrine, endocrine and neurocrine secretion, cell growth and the transport and secretion of fluids and electrolytes. It accounts for about 2 % of adult human body weight. Over 99% of total body calcium found in bones and teeth, remaining part is present in the blood, extracellular fluid, muscle and other part of the body. The rigidity of the skeleton is due to the insolubility of calcium mixed with phosphoric acid – forming mineral hydroxyapatite. ⁴

The Ca²⁺ ion is essential in wide variety of important physiological processes, including musculature contraction, neuronal excitability, neurotransmitter and hormonal release, membrane integrity and permeability, signal transduction, enzyme function

and blood coagulation. It can slow bone loss in post-menopausal women, may reduce premenstrual syndrome symptoms and is associated with reduced risk of colorectal cancer. It can also reduce chronic hypertension due to Ca²⁺ deficiency. Calcium salts are mainly intended to correct calcium deficiency in osteoporosis. As an antacid, as phosphate binders, acute treatment of tetany, lead colic, placebo hyperkalemia, and cardiac arrest. ⁵

Aim: To do literary study of sudha varga dravya

Objective:

1. Advantage of sudhavarga over modern calcium supplement
2. Various forms of sudhavarga compound.
3. Its efficacy in current ayurvedic practice.

Study design:

1. To do classification of sudha varga.
2. To do study of Pharmacology of Sudhavarga dravya
3. Role of shodhana and marana in Sudhavarga.
4. Comparative study of Sudha varga and modern calcium supplement.

MATERIALS AND METHODS:**Classification of Sudhavargeeya dravya**

In Charak Samhita and Sushruta Samhita 'Sudha' comes under parthiva dravya. Both Rasaratnakara and Rasarnava include it in 'Shukla Varga' Rasamritam has included these drugs under 'Shudha Vijyaneeyama' based on their chemical composition.

Sudha varga includes both Khanija dravyas (drug of mineral origin) like Khatika, Sudha, Godanti and

Pranija dravyas (products obtained from animals) like Samudraphena, Shankha, Shukti, Mukta, Pravala, Kurmaprutha, Mrugshruna, Kukkutanda twak etc. Among these Kaparda has been group under 'Sadharana Rasa' 6(group of minerals depending on their role in alchemical processing of mercury) whereas Pravala and Mukta comes under Ratna Varga (group of gems)7 Sudhavarga is different by different authors. Mukta and Pravala were included by recent authors in Rasashastra.

Table No. 1: Sudhavarga dravyas according to different authors

Sr. No.	Name	Rasaratnakara ⁽⁸⁾ and Rasanarva ⁽⁹⁾	Ananda Kanda ⁽¹⁰⁾	Rasamritam ⁽¹¹⁾	Ayurvediya Rasashastra ⁽¹²⁾	Rasashastra - The mercurial system ⁽¹³⁾
1	Sudha	+	-	+	+	+
2	Khatika	-	-	+	+	+
3	Godanti	-	-	+	+	+
4	Shankha	+	+	-	+	+
5	Kshudrasanka (Sambuka)	-	+	-	+	+
6	Muktashukti	-	+	-	+	+
7	Varatika	+	-	-	+	-
8	Kurmaprista	+	-	+	+	+
9	Suramasaphed	-	-	+	-	-
10	Pravala	-	-	-	+	+
11	Mukta	-	-	-	+	+
12	Mrugashruna	-	-	-	-	+
13	Kukkutanda twak	-	-	-	+	+
14	Ajasthi	-	-	-	+	-
15	Badarashma	-	-	-	+	-
16	Vamshalochana	-	-	-	+	-
17	Swetanjana	-	-	-	-	+
18	Hastidanta	-	-	-	-	+

Table No. 2: Description of Sudhavargeeya dravya

Sr. No.	Name	Common name	Origin	Chemical constituents	Form
1	Sudha	Lime		CaO	Oxide
2	Khatika	Chalk		CaCO ₃	Carbonate
3	Godanti	Gypsum		CaSO ₄ 2H ₂ O	Sulphate
4	Shankha	Conch shell		CaCO ₃	Carbonate
5	Kshudrasanka (Sambuka)	Australian snail		CaCO ₃	Carbonate
6	Mukta sukti	Pearl oyster shell		CaCO ₃	Carbonate
7	Varatika	Cowry shell		CaCO ₃	Carbonate
8	Kurmaprista	Turtle shell		Calcite	Phosphate
9	Samudraphena	Cuttle fish bone		CaCO ₃	Carbonate
10	Pravala	Coral		CaCO ₃	Carbonate
11	Mukta	Pearl		CaCO ₃	Carbonate
12	Mrigasringa	Deer's anthers		Ca ₃ (PO ₄) ₂	Phosphate
13	Kukkutandtwak	Hen's egg shell		CaCO ₃	Carbonate
14	Ajasthi	Goat's bone		Calcium, Phosphorus etc	Phosphate

Pharmacology of Sudhavargeeya Dravya

Most of Sudaha varga are highly effective in combating hyperacidity and dyspepsia because they rich in calcium salt which aid in acid neutralization. Pravala and Mukta have Deepan (appetizer) and Pachana (digestive) properties. Mantain normalacy of agni and helps in curing and preventing ulcers.¹⁴ The kshariya (alkaline) nature of both drugs would reduce the amliyata (acidic nature) and helps in Vrana ropana (promotes wound healing). Due to sheeta virya (the drug having cold potency or cooling effect usually resembles to endothermic) which does pittashaman (pacify the biological fire) and vrana ropana. Praval pisthi, Praval bhasma and Mukta bhasma are useful in the burning sensation, dyspepsia.^(15, 16) Pravalpanchamruta rasa indicated in Amla pitta¹⁶. In experimental study Mukta bhasma produced significant protection in against cold resistant stress induced gastric ulcer and Diclofenac induced ulcer respectively¹⁸. Mukta pisti has appreciable properties in Raktatisara, active digestion and alleviates disease of digestion. It alleviates burning sensation.¹⁹

CaCO₃ is the alkaline based it required extra stomach acid for better absorption. So best taken after meals. One difference between various calcium compounds in the percentage of elemental compound present. In CaCO₃ form, Ca accounts for 40 % of the compound, while Ca citrate form provide 24% elemental calcium. Calcium in cereals and green leafy vegetables are less utilized due to presence of oxalates and phytates present in them respectively. Calcium compound are alkaline in nature. The natural calcium preparations like Bhasmas are more effective than synthetic calcium due to the reason that, they contain easily adsorbable form and assimilate form of oxide and they contain other trace elements such as magnesium, copper, zinc etc. Irrespective of the gastrointestinal conditions they do exhibit their efficacy unlike synthetic molecules which can not be absorbed in unhealthy gut conditions such as indigestion, chronic gut motility disorders and hormonal imbalances. The additional advantage of bhasma of Sudhavarga dravya is that the exhibit other therapeutic actions such as correcting in digestion and properties like antacid, ulcer healing and anti-colic properties which can not be expected with synthetic molecule.²⁰

Shodhana of Sudhavarga dravya²¹

Shodhana of Sudha vargeeya dravya is done in Amla vargadravya. As all these are calcium compounds and may contain physical and chemical impurities and has alkaline in nature. The amla dravyas are acidic in nature and hence removes the excess alkaline nature of calcium compounds. Thus to make smoother and palatable form the shodhana is necessary.

Role of Kumari in marana of Sudhavarga dravya²²

Kumari contains calcium which is important for the body, if kumara is used for the preparation of

sudhavarga bhasmas, these bhasmas are easily adsorb in the body. Kumari swaras having many trace elements, amino acids, Vit B1, B2, B3, B5, B6, B12 along with Ca, Mn, Zn, Ph, K etc. The pharmacological action gets influenced by presence of these elements. The pharmacological action gets influenced by presence of these elements. Kumari being having Tikta, Madhura rasa, Vishaghnata, Jwarahara, Kasa Shwasa nashak, Kushtahara, Tridosahara. These properties are increased due to bhavanasanskara, size of particles also becomes less. Due to bhavana process particle size is reduced and efficacy of dravyas is increased. It is stated in ayurvedic text that "Mardanam Gunavardhanam".

Calcium deficiency - Ayurvedic perspective:

Ayurveda deals elaborately with various aspects of dietics. But description of micro and macro nutrients is not available in classical literature the calcium deficiency symptoms can be viewed from two different perspective as vatadosha vridhilakshana and asthidhatu kshaya lakshana.

Nirukti of vatadosha is derived from the root words va and ta meaning gati – to move and gandhana means energy. Vatadosha initiates all the movements and action in the body when agreevated it produces different kinds of pain sensation like catching, twitching, aching, contractions, numbness, pricking²³, etc. Various pain manifested of the muscular and skeletal system system, numbness of digits etc. are seen during the insufficiency of calcium in the body. Just like painful menstrual syndrome associated with calcium insufficiency, the udavartini yoniroga is manifested as painful and santy menstrulation.²⁴ Balaupaghata (decreased level of energy or enthusiasm) is characteristic feature of vatavruddhi. Lethargy also seen with vatavruddhi. Lethargy also seen associated with calcium deficiency. The features of osteoarthritis like edema, arthralgia and restriction of movement are same as that of sandhigatvata.²⁵

Asthidhatu may be understood as skeletal framework of body. The appendages of our body, mainy hair, nails and teeth are considered to be formed from asthi dhatu kshaya are asthishoolam, hair fall, cracking teeth and brittleness of nails. The signs are very similar to those seen in calcium insufficiency The vatadosha and asthi dhatu are associated with each other by asraya –asrayi bhava The reason for vataprakopa is in short – dhatu kshaya and avartana. Hence, the kshaya of asthi dhatu may be considered as reason for vataprakopa.²⁶

Calcium supplementation

The disease treated with calcium supplements fall in 3 categories. 1. Used to overcome calcium malabsorption by increasing the diffusion component of absorption. They include, hypothyroidism, osteoporosis, malabsorptive bowel syndrome. The most common use of calcium supplementation is

prevention of age related osteoporosis. 2. Calcium used for chelating certain anions, mainly phosphate. It is used in chronic renal failure, where there is a reduction in phosphate absorption. It is also used in age related osteoporosis. 3. Symptomatic gastric acidity –calcium carbonate is used as an antacid between meals to neutralize gastric acidity in gastro-esophageal acid reflux disease and peptic ulcer disease. (27, 28)

Advantages of Ayurveda drug over modern calcium supplements

The parthiva and jangam dravyas rich in calcium act as a direct source of calcium malabsorption or asthi dhatu kshaya and vataprakopa which manifests as calcium deficiency symptoms in the body.

The parthiva dravyas are consumed in the form of bhasmas except for mukta and pravala. They contain other elements in them along with calcium. Godanti bhasma contains sulphur, shrunga bhasma contains zinc, magnesium and other heat stable amino acids. Due to the reason that the bhasmas of sudhavarga dravyas contain other elements in trace forms and that they are mild oxides and carbonates that can be easily absorbed and assimilated. These are usually alkaline in nature. The synthetic molecules cannot be absorbed in unhealthy gut conditions. On the other hand, the sudhavarageeya dravyas help to correct the abnormalities in gut, heal ulcers and impart anticolic activity. The presence of oxalate and phytates reduces the absorption of calcium from synthetic molecules. Only 10% of the calcium consumed will be absorbed from synthetic compound. (29)

Discussion:

Ayurveda uses a large number of dravyas of different origin, rich in calcium. The mineral drugs are subjected to swedana and marana processes with suitable medium depending on the chemical composition of dravyas. The shodhana and marana process helps to convert this calcium compound to more adsorbable and assimilate forms. By virtue of various pharmacological properties these dravyas help to correct gut morbidities like parinamashoola, amlapitta etc by their properties of ropana etc further, the pH of the gut gets corrected which in turn enhances the absorption of calcium. This is the greatest advantage of sudhavarageeya dravya over modern calcium supplements. Most of calcium supplements impart constipation, bloating etc. On the other hand, the sudhavarga dravyas are deepana –pachana in nature, which prevents these complications. They will cause mild gastric irritation and modern calcium supplements will not be absorbed in various conditions of gut morbidities.

Another important controversy regarding the modern calcium supplementation is the difficulty to determine the form of calcium salts in various supplements. While sudhavarga drug administered along with

suitable anupana depending on the condition of disease, which further aid the absorption and assimilation of these compounds over the modern calcium supplements.

The dose fixation of modern calcium supplements is either another limitation, with regard to the ayurveda drug and formulation, the dose of each drug in different formulations etc has been fixed depending upon the compound present. In addition, suitable anupanas have been described to ensure absorption of optimum quality of calcium from these compounds and ensured that the desired therapeutic action will obtain from each drug. As the dose of modern calcium supplement is not fixed, sometimes it may lead to inadequate or excess level of calcium than the desired levels which may precipitate adverse reactions.

CONCLUSION:

From the evidence from the classical literature and recent researches, it can be concluded that the Sudhavarga dravyas can be considered as the calcium containing drugs in Ayurveda. They have a wide range of therapeutic action in jwara, raktapitta, swasa, kasa, hridrog, khalitya, palitya, parinam shola etc and in various external applications like vasti, avachoorana etc. Recent researches on experimental pharmacology have proven that coral calx improves bone mineral density. Ayurvedic dravyas have many advantages over modern calcium supplements as they are available in various dosage forms, they have fixed dose and adjuvant which insures proper absorption. They can be used even in the gut morbidities. Though they can be successfully used as calcium supplements in various conditions, there is no reference of calcium containing drugs in ayurveda being used in bhagna. The further focus has to be brought to establish the use of Ayurveda drugs and formulations as calcium supplements in various conditions by clinical and experimental models.

REFERENCES:

- [1] SpokenSanskrit.de/index.php
- [2] Triphati Indradeva, Rasarnavam nama Rasatantran, edited by Dr. Dixit Shri Krishna; Third edition 1995; Chowkamba Sanskrit Series Office, Varanasi; 55-PP; Chapter 4, Shloka No- 45, Page no-50.
- [3] Trikamaji Yadavaji Acharya, Rasamritam, Trans Dr. Joshi Damodar; First Edition 1998; Chaukamba Sanskrit Bhavan, Varanasi; 315-PP, Page no -118.
- [4] Indu S, Ashok Kumar P. , Krushna Rao S and Jayaram H, Central Ayurveda research Institute for Hepatobiliary Disorders, Bhubaneswar, India Ayurvedic Perspective of Calcium Supplementation – A Review, ISSN: 2376 -1318
- [5] Indu S, Ashok Kumar P. , Krushna Rao S and Jayaram H, Central Ayurveda research Institute for Hepatobiliary Disorders, Bhubaneswar, India Ayurvedic Perspective of Calcium Supplementation – A Review, ISSN: 2376 -1318

- [6] Vagabhatta Acharya, Rasaratna Samucchaya, Dr. Satapute D. Ashok. 1st edition, Chaukhama Sanskrit Pratisthan, Delhi:3/115-116(2003)
- [7] Vagabhatta Acharya, Rasaratna Samucchaya, Dr. Satapute D. Ashok. 1st edition, Chaukhama Sanskrit Pratisthan, Delhi:4/3, (2003)
- [8] Rasaratnakara, Meharchand Lachhmandas Publication, New Delhi:4/14, (2006)
- [9] Tripathi Indradeva, Rasanarva nama Rasatantram, edited by Dixit Rama Krushna, 3rd edition. Chaukhama Sanskrit series office, Varanasi4/45(1995).
- [10] Mishra Siddhinandan –Ayurvediya Rasashastra, Chaukhamba Orientalia, Varanasi chapter sudhavarga, Pg no. -571, 2007(Ananda kanda kri 1/297).
- [11] Trikamaji Yadavaji Acharya, Rasamritam, trans by Joshi Damodar, 1st edition, Chaukhamba Sanskrit Bhavana, Varanasi, page no-112, (1998).
- [12] Mishra Siddhinandan –Ayurvediya Rasashastra, Chaukhamba Orientalia, Varanasi chapter sudhavarga, Pg no. -571, 2007.
- [13] Murty Hingsagar Chandra, Rasashastra Chaukhamba Sanskrit series office, Varanasi, page. no. 370, 2008.
- [14] Kulakarni D. A. Rasaratna Samucchaya, Meharchand Lachmandas Publication. New Delhi4/14, (2006).
- [15] Ghosh Kuntal, Baghel M. S, Review of clinical observational studies conducted on 1812 patients of Amlapitta at I. P. G. T. and R. A. Jamanagar, IJRAP, 2(5);1410-1415, 2011.
- [16] Shastri Haridatta Editor. Rasa Tarangini of Sadananda Sharma, 11th edition New Delhi, Motilal Publication, 1979.
- [17] Mishra Siddhinandan, Editor Rasendra Chudamani Of Somdeva, Chaukhamba Orientila, 2009, P200.
- [18] Pandit Sharma Haripranana, Rasayoga sagar, vol 2 Chaukhamba Krishnadas Academy, P. no. 172, 2010.
- [19] Nitin Dubey, R. S. Mehta, Saluja A. K. Jain D. K. , antiulcer activity of traditional peral preparation: Mukta Bhasma, Indian Jounal.com, 2009.
- [20] Suma Jambli, Chavan S G, Prashanth AS, Application of Sudhavargeeya Dravya in Raktapitta Chikitsa. ISSN 2456 -3110 Vol 2. Issue 5 Sept –Oct 2017.
- [21] Suma Jambli, Chavan S G, Prashanth AS, Application of Sudhavargeeya Dravya in Raktapitta Chikitsa. ISSN 2456 -3110 Vol 2. Issue 5 Sept –Oct 2017.
- [22] Deshamukha Kavita Shailesh, Role of kumara swarasa in the marana process of Sudhavarga dravyas with special reference of Godanti bhasma prepared by two different methods.
- [23] Wang M, Yang X, Wang F, Li R, Ning H, et. al. (2013) Calcium –deficiency assessment and biomarker identification by an integrated urinary metabolomics analysis. BMC Med 28:86.
- [24] Pal S, prakash C (2017) A Critical review of Kamini Yonivyapad w. s. r. to cervical erosion, Ayushdhara 4:1478-1485.
- [25] Tripathi B (2008) Charak Samhita with hindi translation, Chaukhamba Varanasi: Surbharati Prakashan, Varanasi, India . p. 940.
- [26] <http://creativecommons.org/licenses/by/3.0/>
- [27] Shin C, Kim K (2015) The risks and benefits of calcium supplementation. Endocrinol Metab (Seoul), 30:27-34.
- [28] Li K, Wang XF, Li Dy, Chen YC, Zhao LJ, et. al. (2018) The good, the bad, and the ugly of calcium supplementation: A review of calcium supplementation: A review of calcium intake on human health. Clin Interv aging 13: 2443-2452.
- [29] Thakur V, Sharma K, Vashisht K (2016) A therapeutic approach of sudhavarga dravya w. s. r. to gastro intestinal disorder. Ayushdhara 3: 602 - 606.

Cite this article as:

Rupali Dale, Sunil C. Bakare, Overview of the Sudhavargeeya dravya with respect to Calcium, ADJIM 2021: 6(4), p. 10-14.