



Review Article

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THERAPEUTIC POTENTIAL OF RAJATA (SILVER) BHASMA: A REVIEW

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ABSTRACT

The various ancient Acharyas have claimed that drugs of herbal, metal or animal origin along with various Pathyapathya (dietary regimes) are suitable to maintain the health in healthy and to treat the diseased one. With great authority various processed metals like Gold, silver, Lead, Zinc, Copper including Mercury etc were used by the Acharyas to treat the various disorders; the usage of metallic preparations can be termed as a unique feature in healthcare system. Before using these metals for desired therapeutic benefits, they are detoxified by the Shodhana (purification) and Marana (incineration) methods. These methods are highly complex manufacturing processes mentioned in the various Rasashastra texts. Ample references regarding the use of metals and ayaskriti can be traced in the Ayurvedic text Charaka samhita. Swarna (gold), Rajata (silver) are considered to be noble metals; they have properties like medhya, rasayana, balya and vatahara. Silver being cost effective, can be used instead of gold like metals where medhya, rasayana like therapeutic karma (action) is required. Therapeutic potential of Rajata (silver) bhasma along with its dosage and anupana, indicated in various disorders like smritinasha, unmada, apasmara, virya kshaya, vata rogas etc are explained according to various Rasashastra authors.

Key words: Rajata, Rajata bhasma, therapeutic potential, therapeutic application

INTRODUCTION

Rasashastra texts contain description of metals and minerals, their processing techniques and their utilization in therapeutics etc. Ayurvedic pharmacopoeia has routinely been used in practice in different parts of India for many centuries. These preparations are safe and effective even in minute doses but only when they are manufactured under the classical guidelines¹.

Rajata

Rajata (silver) is a noble and famous metal, hence attracted attention of ancient acharyas. The latin name of silver is Argentum (Ag), atomic no. is 47, specific gravity of 10.5, with a melting point of 960°C. It is a bright shiny, lustrous white metal. In Ayurveda it is classified under Dhatu varga. Synonyms like Taara, Shubhra, Ruchira, Chandra, Roupya, Rupyaka, Chandraloha, Saudha etc are mentioned in the classics¹. Three types are mentioned by Rasa Ratna Samuchaya as Sahaja, Khanija, Krutima. The use of silver in therapeutics dates back to the period of Charaka and his contemporaries. Since ancient times it is used for the therapeutic purpose, references can be traced since Samhita kala. Rajata being cost effective, abundantly available and consists similar properties like medhya, rasayana etc as that of gold, can be used instead of gold in therapeutics.

Grahya lakshanas

According to the classical text Rasa Tarangini, grahya lakshana are Swachha (clear), Guru (heavy), Snigdham (with metallic sheen), and Dahe Chede Samaprabham (which also become bright white on heating or cutting), Sphota rahitam (without any

ridges or furrows) is genuine and can be considered acceptable for therapeutic purposes.²

Rajata Bhasma

Silver metal cannot be directly indicated for consumption. It needs to undergo various classical procedures like shodhana (purification of the metal) and marana (incineration) to make it fit for the body when given internally¹. Various procedures for Shodhana and Marana of Rajata are explained to make it fit for consumption. This Rajata is converted into Rajata bhasma (nano particle) after it undergoes samanya, visesha shodhana explained for the dhatu varga and then the bhasmikarana (incineration) procedures where it is processed with organic matter, followed by the puta samskara (quantum of heat). These are to convert it into micro fine powder through the specially designed process called marana (incineration). This helps to reduce the metal thereby decreasing the toxic effect and makes the Rajata therapeutically potent, fit for consumption with a proper anupana (vehicle) increasing the desired therapeutic effect.¹ Emphasis is given to purification of metals and their conversion to micro-fine powders by following specified guidelines, processes which were termed Ayaskriti in Charaka samhita. Quantitatively Rajata Bhasma is a combination of metallic silver (52 to 59%), free sulphur (0.675%), ferric oxide (14.33%), calcium (10.769%), silver chloride (0.479%), and traces of sodium, potassium and aluminium etc is shown in the analytical study of Rajata bhasma carried out.³

Properties of Rajata Bhasma

The guna (properties) of Rajata bhasma explained are Kashaya Amla rasa, Snigdha guna, Sheeta virya, Madhura vipaka,

Vatakaphahara in nature⁴. Various authors of Rasashastra texts have their opinions regarding the guna karma. According to the text Rasa Tarangini it is Vatapittahara⁵.

Action of Rajata Bhasma

Various karma (actions) mentioned are Balya⁴, Rasayana⁴, Medhya⁴, Daahahara⁵, Ayushya⁴, Ojo Vardhaka⁴, Vayah sthapaka⁵, pramehahara⁵, sukramehahara⁵, shoshahara⁵ etc.

Indications and dosage

Rajata bhasma has a wide range of indications, like in smritinasha, unmada, apasmara, nidranasha, virya kshaya, vata rogas, netra rogas, amlapitta, aruchi, jwara, Suska kasa, dorbalya, etc.^{4,5} According to Rasa Chikitsa, it is indicated as shotha, prameha, vayu pitta vriddhi, kaasa, shwasa, gulma, karshya, rakta alpata, rasayana³⁹ etc. The dosage range of Rajata Bhasma can be 30 mg to 125mg given along with different anupana depending upon the disorders prevailing. Due to lack of clinical data, its therapeutic applications are also lacking.

Formulations

Rajata bhasma itself is used as an ingredient in various formulations⁶ like Bruhat vata chintamani rasa given in neurological conditions, Makardhwaja vati, Vasant kusumakara rasa given in cardiac disorders, Manas mitra vati given in various psychological conditions, Bhrihat kasturibhirava rasa, Jayamangala rasa given in various types of fever etc.

Samhita

In Charaka Samhita, references mentioned are for preparation of Bastinetra (nozzle part of the enema instrument)⁷, Jihwa

nirlekhana (Tongue cleaner)⁸, Madyapana patra (pots for alcohol consumption)⁹, Nabhi Kartana Dravya (Scissors for cutting umbilical cord)¹⁰; these are for the external uses. For the internal uses as an ingredient in Bhramha rasayana-2¹¹, preparation of lohadi rasayana¹², Indrokta rasayana¹³, Yogaraj in pandu, kushta, prameha¹⁴ etc, Muktdi Choorna in shwasa, hicca¹⁵. In Susruta Samhita references quoted are - Rajata pots to store rain water¹⁶, bathing new born baby¹⁷, making shalaka for anjana¹⁸, boiling water in silver pots to relieve udarashoola (it should be poured on the affected part)¹⁹ etc. According to Ashtang Sangraha, references are found for water purification²⁰, preparation of Choornanjana in andha moosha contains silver, gold, iron²¹ etc.

Close scrutiny makes it clear Rajata was well known for its antimicrobial activity and have held a significant place in Ayurvedic pharmacopoeia since antiquity. Silver nano particles are extensively used in the treatment aspect because of its antimicrobial activity. These are used in surgical sutures, prostheses for CVS, bandages, urinary catheters, endo-tracheal tubes, bone cement, dentistry etc to prevent infection²². Other non therapeutic uses of metal silver are coins and bullions, vessels, containers, plates, spoons, idols of gods, temples, decorative silverware, jewelries, handicrafts, specialized mirrors, solar energy, musical instruments, infrared telescope, clothes work and designs etc., where it is extensively used.

Rajata bhasma has a wide range of indications in various disorders. Commonly Rajata bhasma is indicated in manovaha vikara like unmada, apasmara, mastikshka dorbalya, smritinasha, anidra, madatyaya and sukravaha vikara like virya kshaya, upadamsha²³. Various indications along with dosage and anupana are listed below in the following table:

Table 1: Indications of Rajata bhasma

| Sl no. | Indications | Dose of Rajata bhasma | Dravya given along with Rajata bhasma |
|--------|----------------------------------|-----------------------|--|
| 1. | Unmada | 1 Ratti (125mg) | Vacha churna, ghrita |
| 2. | Apasmara ⁵ | 125 mg | Vacha churna and ghrita |
| 3. | Mastishka dorbalya, Shiro vikara | 125 mg | Pravalapishiti 1 ratti and smritisagara rasa 1 ratti, then brahmi swarasa is given to drink. |
| 4. | Smritinasha ^{4,5} | 125 mg | Bhramhi ghrita |
| 5. | Anidra ⁵ | 125 mg | Swarna bhasma 1 ratti, pravala bhasma 1 ratti with hot milk |
| 6. | Madatyaya ⁵ | 125 mg | Ghrita |
| 7. | Virya kshaya ⁵ | 125 mg | Mukta bhasma 1 ratti, vanshlochana-2 ratti, ela, keshara churna- 2 ratti, madhu and godugdha |
| 8. | Upadamsha (vatija) ⁶ | 125 mg | Vanga bhasma-1 ratti, shilajit-2 ratti with ushna dugdha |

[1 ratti- 125 mg]¹

The other indications of Rajata bhasma mentioned in the classics are as follows:

Table 2: Indications of Rajata bhasma

| Sl no. | Indications | Dose of Rajata bhasma | Dravya given along with Rajata bhasma |
|--------|---|-----------------------|--|
| 1. | Kotha ⁵ (gangrene) | 1 ratti (125mg) | Ela, vamshalochana, guduchisatva, ma |
| 2. | Pandu ⁴ | 125 mg | Lauha bhasma or mandura bhasma 1 ratti |
| 3. | Prameha ⁵ | 125 mg | Madhu or shilajit-1 ratti for 21 days |
| 4. | Jwara (vatija, pittaja) ⁵ | 125 mg | Pippali churna, ela, along with dhanyaka arka |
| 6. | Amlapitta (vata pradhana) | 125 mg | Ghrita |
| 7. | Aruchi, Ajirna ⁵ | 125 mg | Ghrita |
| 8. | Arsha (vatija, pittaja, raktaja) ⁵ | 125 mg | Gandhaka rasayana |
| 9. | Trishna ⁵ | 125 mg | Ghrita |
| 10. | Vata rogas ⁵ | 125 mg | Ghrita |
| 11. | Netra roga (vata pradhana) ⁴ | 125 mg | Triphaladi ghrita-1 tola (12 g), sita-1 tola, given 2 times and eye wash with triphala kwatha. Pravala bh. |
| 12. | Snayu dorbalya ⁵ | 125 mg | Abhraka bhasma-1 ratti |
| 13. | Daaha ⁵ | 125 mg | Sita 1 masha (6 g) with dhanyaka hima. |

[1tola- 12 g, 1masha- 6 g]¹

Few of the formulations containing Rajata bhasma as one of the ingredient which are commonly practiced are listed below:

Table 3: Various formulations of Rajata bhasma

| Sl no. | Name of formulation | Ingredients | Indications | Dose and anupana |
|--------|---|---|--|--|
| 1. | Kumara bharana rasa ²⁴ | Swarna bh, Rajata bh. pravala, yashtimadhu, amlaki, ashwagandha, sunthi, pippali, haritaki, vacha, guduchiswarasa, brahmi, tulsi. | Bala rogas, Rasayana, balya, medhya etc | 1 tab 500 mg, with ghrita In children- 250mg lehya made with ghrita |
| 2. | Manasa mitra vati ²⁵ | Swarna bh, Rajata bh. , pravala, yashtimadhu, amlaki, ashwagandha, sunthi, pippali, haritaki, vacha, guduchi swarasa, brahmi, tulsi etc. | Mano vikaras, unmada, apasmara etc | 1 tab/day with ghrita |
| 3. | Brihat vata chintamani rasa ³⁵ | Swarna bh. 1 tola, Rajata bh. - 2 tola, abhraka bh.-2 tola, moutika bh.-3 tola, pravala bh.-3 tola, loha bh.- 5 tola, rasa sindoor- 7 tola | Vata rogas, anidra, sannipataja jwara, pakshaghata, aridita etc | 1 tab, 3-4 times/day with madhu |
| 4. | Vasant kusumakar rasa ³⁴ | Swarna bh, Rajata bh. , vanga bh, naga bh, kanta loha bh, rasa sindoor, abhraka bh, pravala bh, moutika bh, godugdha, vasa, ikshu etc. | Prameha, kasa, shwasa, rajyakshma, vrushya etc. | 1-2 tab 2 times with takra, madhu, ushna jala. |
| 5. | Makardwaja rasayana vati ^{33,35} | Swarna bh., vanga bh., kanta lauha bh., mautika bh., javitri, jayaphala, Rajata bh. rasa sindoor, pravala. Bh., kasturi., shu. Karpura, abhraka bh., -1 tola each swarna sindoor-9 tola. | All types of prameha, hridroga, swheeta pradara, vata roga, kasa, shwasa, all types of jwara, unmada etc | 2-2 ratti -2 times with adraaka rasa |

Other formulations containing Rajata bhasma are Brihat kasturibhirava ras, Jayamangala rasa, Kumudeshwara rasa, Vijaya parpati, Indu vati, Unmada Bhanjana rasa, Ratneshwara rasa, Maha Raj Nrupati Vallabha rasa, Vaari Shoshana rasa, Swacchanda Nayaka rasa, Sarwa Jwarahara loha, Navaratna Raja Mruganka rasa, Somnatha rasa, Mehantaka rasa, Suwarnabhupati rasa etc are mentioned in the classical texts of Rasashastra¹ in the treatment aspect.

Various activities of Rajata bhasma like anti microbial^{26,27,28} bacteria's like *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* were taken for studies results showed Rajata bhasma alcoholic extract is very effective against all bacterial strains. Moderate anti-bacterial activity was observed when Rajata bhasma used as suspension in honey and ghrita, no activity was seen in aqueous extract of Rajata bhasma. Spermatogenic activity²⁷, antioxidant²⁹, immunomodulator etc. has been proven through various studies. Silver nano particles are extensively used in the treatment aspect because of its antimicrobial activity. These are used in surgical sutures, bandages, urinary catheters, bone cement, dentistry etc to prevent infection²². And can be applied to a range of other healthcare products as dressings for burns, scald, acne, cavity wounds, sanitary towels, hand wash, soaps etc. due to its natural anti bacteria and anti-fungal properties.

DISCUSSION

Silver is a well-known noble metal used externally as well as internally since ancient times due to its antimicrobial activity for water purification and therapeutically also. It becomes clear from screening the various classics that silver and other metals like gold, iron, copper, lead, tin etc as well as some alloys were used to treat a wide range of diseases. Fine powders of these metals were prescribed for both internal and external applications. Systemically, Rajata bhasma is prescribed in neurological conditions like acute headache, migraine, memory loss etc., psychological conditions like Unmada⁴, Apasmara, Smritinasha⁵ (memory loss), depression, stress, anxiety, Anidra (insomnia) etc., respiratory conditions like Kaasa⁵ (dry cough), digestive disorders like Amlapitta (hyperacidity), Aruchi (anorexia) etc., skin diseases like Kotha⁴ (gangrene), other infectious conditions like upadamsha⁶ (Gonorrhoea) and urinary tract infection etc. In reproductive system related conditions like Virya kshaya (oligospermia), increases the fertility rate, reduces any infection or pus if present, works as antibiotic. Therapeutic

application^{4,5,6,39} of Rajata Bhasma is seen in Vata rogas, Sukramehaghna, Daahahara, Mano vikaras, arsha, gulma, pandu, agnimandhya, shotha, prameha, vykrut pleeha vikara etc due to its Vatapittahara, lekhana, Vrushya, Medhya, Rasayana, Balya, Hridya, Medhya, Vrushya properties and balances the tridoshas when given in a proper dosage and anupana or in combination with other herbal drugs. Its lekhana guna (scraping property) is helpful in cardiovascular disorders. Due to sheeta Virya, acts as Pitta Shamaka and Daahahara⁵. Use of these metallic preparations with great authority is safe and efficacious when used judiciously. Reviewing the classical texts of Rasashastra, it reveals that emphasis is required while prescribing these metallic preparations for therapeutic benefits. The various pharmaceutical techniques explained in texts like shodhana etc have their own significance in detoxifying and increasing the therapeutic potential of any metal².

CONCLUSION

Studies carried out indicate that when metals and minerals are converted into medicines strictly adhering to the classical guidelines specified in ancient texts, they are devoid of any toxicity. The incinerated metal may contain associated compounds together with major elements, which have their own significance in the process of disease pacification. Rajata bhasma is used as an ingredient in various formulations prescribed in almost all systemic disorders, when prescribed in proper dose with proper anupana (vehicle) shows effective results. It is extensively prescribed in neurological, psychological disorders, infertility, degenerative disorders and infectious conditions etc. Due to its proven anti-microbial activity it has wide applications in the stream of medicine. Though various Rasa shastra texts like Rasa Tantra Saara, Siddhi Prayoga, Rasa Chikitsa etc explain their practical observations and experiences regarding the therapeutic applications of Rajata bhasma in treating various disorders. But due to lack of clinical scientific data, need of time is to carry out various scientific clinical trials and statistical data to prove its therapeutic efficacy in various disorders.

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