Review Article

A REVIEW ON THERAPEUTIC APPLICATION OF SWARNA MAKSHIKA BHASMA

Sruthi Nambiar 1*, Vinay R Kadi bagil 2, Gazala Hussain 3

1PG Scholar, Dept. of Rasashastra and Bhaishajya Kalpana, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan Karnataka, India
2Professor, Dept. of Rasashastra and Bhaishajya Kalpana, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan Karnataka, India
3Associate Professor, Dept. of Agada Tantra, Sri Dharmasthala Manjunatheswara College of Ayurveda and Hospital, Hassan Karnataka, India

*Corresponding Author Email: sruthi.nambiar5@gmail.com

Article Received on: 29/09/17 Accepted on: 14/10/17

DOI: 10.7897/2321-6328.05568

ABSTRACT

Bhasmas are multi elemental drugs derived from natural sources, which are administered after subjecting to various processes like shodhana and marana. Swarnamakshika bhasma is one such bhasma explained under maharasa varga and upadhatu of swarna. It is a gold like chalcopyrite (CuFeS2) containing iron and copper as major constituents. Swarnamakshika Bhasma is an independently and extensively prescribed medicine. As it is soumya (mild) formulation containing Fe and Cu and tridosha pacifier, it can be prescribed in almost all diseases even in pregnancy & children with proper anupana and right dose. The current article is to highlight the therapeutic application of swarnamakshika with its probable mode of action.

Keywords: Swarnamakshika bhasma, Chalcopyrite, Therapeutic application

INTRODUCTION

Swarnamakshika (Chalcopyrite) is an important mineral placed in maharasa varga in Rasashastra. Owing to its high therapeutic efficacy, applicability towards parada bandha (assists in amalgamation of para and abhraka (mica)) it is considered as prana of Rasendra (essence of lord shiva). Rasa Ratna Samucchaya explains it further as vrushya (aphrodisiac), agrya rasayana and sakalamayagghna (useful in all diseases) 1. Swarnamakshika is grouped under upadhatu of swarna as it has similar properties of Swarna, also it possess additional properties due to addition of loha (iron) and tamra (copper) in it2. Chalcopyrite is copper pyrite with copper and iron as major constituent. Common name of chalcopyrite is fool’s gold due to its high resemblance with gold in colour.

Occurrence of Swarnamakshika

The reference regarding Swarnamakshika occurrence is found in Rasa Patna Samucchaya as yavana desha (Greece), tapati teera (Madhya pradesh), kirata desha (Nepal), cheena desha (China) 3. Currently natural ore of chalcopyrites is obtained from Khetri mines in Rajasthan, Malanjkhhand in Madhya pradesh and Ghatshila in Jharkhand.

Classification of swarnamakshika

It is generally classified as swarnamakshika and rajatamakshika. Swarnamakshika is superior variety which is similar to swarna in appearance. It is explained as pancha varna suvarnavat. Rajatamakshika is inferior variety having less potency and contains much of the stone4. Another type of makshika; kamsya makshika is also explained.

Chalcopyrites though universally accepted as swarnamakshika, two different sources are mentioned in API. They are Chalcopyrites (Swarnamakshika) and Copper concentrate chalcopyrites (sandritra swarna makshika). The former is natural ore with Cu content not less than 5%, Fe content not less than 12%, and sulphur content not less than 20% in it. The latter is created by artificial intervention where the concentration of Cu is enhanced to not less than 12%5.

GRAHYA LAKSHANA VERSUS MINERAL PROPERTIES

Any mineral to be considered that of rasa dravya mentioned in classic, grahya lakshana (necessary qualities) and mineralogical properties should go hand in hand. Grahya swarnamakshika is golden coloured, guru (heavy), snigdham (unctuous), nishkona (without angles), and on rubbing on hand produces blackish tinge6. Chalcopyrites also possess similar properties, it is brassy yellowish in colour, with metallic lustre, hardness 6 – 6.6, uneven fracture and imperfect cleavage (nishkona) and streak is brownish black7. So they can be considered as the same. Similarly, Rajatamakshika can be considered as ironpyrates without angles. Ironpyrates with angle becomes vimala (as grahya lakshana explains 6 angles, 8 planes). A different opinion on grahya lakshana regarding swarnamakshika can be traced in Ayurveda prakash; where author quotes eeshat neelacchavi (bluish tinge) 8.
PROPERTIES
Swarnamakshika though is a widely used rasa dravya, its properties including rasa pancha were not explained until the period of rasasastra. In Brihattrayi little reference can be found regarding individual properties. It is madhura tikta rasa yukta drug having guru (heavy) (in terms of hardness) with laghu (light for digestion) guna. It is a best rasayana dravya. Amayika prayahka (clinical application) is explained in detail in Rasatarangini).

Therapeutic application of swarna makshika in Samhita
References of therapeutic applications of swarnamakshika can be found in all Brihattrayi as single drug administration or as in combinations. But there is no mentioning of mode of use, anupana, and dose and purification protocol to be followed. It may be inferred that purification method prevailed in samhita kala but it has not been documented.

PURIFICATION OF SWARNA MAKSHIKA
Ashuddha apakva lakshana & Chikitsa
There is no rasa dravya mentioned in classics that can be consumed without proper purification procedure. Processing of rasa dravya include procedures such as shodhana (purification) and marana (incineration). Improper shodhana and marana leads to various disorders. In Brihhat Rasa Raja Sunadara, ashuddha (improper shodhana) and apakva (improper marana) lakshana and their management is elaborately mentioned. Ashuddha lakshana include mandagni (indigestion), balahani (loss of strength), vishtambha (abdominal distention), netraroga (eye disorders), kushha (skin disease), and gandamala (lymphedinitis)
. Apakva lakshana is pain). The treatment protocol explained is kulattha kwatha and dadima tvak kwatha with sita (sugar candy) for a period of 3 days.

Kulattha (Dolichos biflorus) is proved anti-oxidant and have free radical scavenging action on superoxide, hydroxyl, nitric oxide, etc. Dadima (Punica granatum) especially dry peel of fruit showed highest anti-oxidant activity compared to counter parts of plants. It is anti – inflammatory, anti-biotic, and anti-cancerous in nature.

Shodhana of swarna makshika
Different methods have been adopted for shodhana including swedana, pancha, nirvapa and putapaka method.

Shodhana by swedana method:
• Swarna makshika is kept in soorana kanda (Amorphophallus campanulatus) and is subjected to swedana in kulattha kwatha, kodrava (Passpum scrobiculatum), nara moosra (human urine), amlavatasa (Garcinia pedunculata), katuraya (Zingiber officinale, Piper nigrum, Piper longum) and Rambha swarasas (Musa sapientum).
• Dolayatra swedana in kadali kanda swarasas (Musa sapientum) for 2 hours.

Shodhana by pancha method:
• Swarna makshika churna 3 parts, saindhava lavaana 1 part and nimbu swarasas (Citrus limon) in iron vessel is subjected to high flame with occasional stirring with ladle till reddish colour is attained.
• Swarna makshika is taken with eranda (Ricinus communis) taila and matulunga (Citrus medica) swarasas till liquid portion completely dries up.

Shodhana by nirvapa method:
• Swarna makshika is heated and immersed in nimbu (Citrus limon) swarasas for 21 times.
• Swarna makshika is heated and immersed in triphala kwatha (decoction of Emblica officinalis, Terminalia chebula, Terminalia belerica) for 7 times.
• Swarna makshika is heated and immersed in tila (Sesamum indicum Linn) taila, takra (curd), kulatha (Dolichos biflorus) kwatha and triphala kwatha.

Shodhana by putapaka method:
The shigru (Moringa oleifera) root is rubbed with Agasti pushpa (Linum usitatissimum) and pashanabheda (Aerva lanata), to it swarnamakshika is rubbed dried and made to balls. It is subjected to fire with 20 cowdung cakes for 7 times.

Swarna makshika marana
Different methods of incineration with parada, mulika dravya (plant origin) and gandhaka, etc. are explained in classics.

Marana with Parada (Mercury)
Shuddha Hingula 1/8 part is added to 1 part Shuddha Swarnamakshika and levigation is done with Nimbu swarasas (Citrus limon) – 8 puta.

Marana with mulika dravayas (Plant drugs)
Shuddha Swarnamakshika is levigated with Nimbu swarasas (Citrus limon) – 10 Gaja puta.

Shuddha Swarnamakshika is levigated with Kumari (Aloe vera) swarasas – 27 Kukkuta puta.

Marana with gandhaka (Sulphur)
Shuddha Swarnamakshika with equal quantity of Shuddha Gandhaka is levigated with matulunga (Citrus medica) swarasas – 5 Varaha puta.

Matra (Dose)
According to Rasatarangini, the dose of swarnamakshika bhasma is ½ to 2 ratti (60mg – 250mg) considering the strength and disease condition of patient.

MODE OF ACTION OF SWARNA MAKSHIKA
Swarnamakshika is chalcophyrite with iron and copper as major constituents. Copper is a major micro nutrient that helps in bone development, maintaining connective tissue and organs, helps utilization of Fe and an Enzyme co factor. It is anti-fungal, anti-microbial, anti-oxidant etc. Iron is a micronutrient that assists in production of heme, enzyme co factor, oxygen transport, in energy development, organ function, muscle function, etc.

Rasayana action: Rasayana action of swarnamakshika can be understood by virtue of anti-oxidant properties of constituent elements. Copper is required in relatively low quantity for optimal health. Cu as a co-factor of metalloenzyme, copper zinc superoxide dismutase (SOD) helps in converting toxic superoxide free radicals to non-toxic hydrogen or oxygen peroxides. Copper deficiency causes improper functioning of macrophages and neutrophils leading to inflammatory reactions, bacterial infection and reduced innate immunity.

Hrudya action: Lysyl oxidase, a copper dependent metalloenzyme helps in crosslinking arterial collagen and elastin there by rebuild and maintains cardiac tissue. SOD is also present in cardiac tissues which is an anti-oxidant promote cardiovascular health. Iron plays an integral part in haeme
production by binding with porphyrin which does oxygenation to entire body. Copper is proved to reduce plasminogen activator inhibitor type 1 which is one of the risk factor of atherosclerosis\textsuperscript{61}.

Neurological action: In anxiety and stress, studies have proved both Fe and Cu intake inhibit GABA (gamma amino butyric acid) receptors. Fe intake reduces the chance of depression if consumed internally in optimum levels\textsuperscript{60}.

Vrushya activity: Ferritin is a Fe storage protein that supports male reproductive system. Sertoli and Leydig cells have abundant amount of ferritin. Fe helps in the development of spermatogenesis. Copper bind with metallothionins (MT); storage protein for Cu and Zn; detoxify a variety of heavy metals in male reproductive system and protect spermatogenic cells. Ceruloplasmin; Copper dependent ferroxidase in sperm is considered as marker compound of proper functioning of seminiferous tubule\textsuperscript{61}.

Other major actions: Vrushaghna and chakshushya properties of swarnamakshika can be attributed to the anti-oxidant properties of SOD, which is present in almost all tissues in body including in major proportions in eye. Research updates on swarnamakshika bhasma suggest the particle size is 931.4nm (DLS method). The elements identified include Fe, Cu, P, S, Si, Ca, Zn, and Mg in major proportions and trace levels of Mn, Al, Na, etc. were also identified\textsuperscript{62}. Evaluation of subchronic genotoxic potential done by Dr Pavan B Savalgi states that, the Swarnamakshika bhasma samples were found to be safe after the administration for 14 days at the therapeutic doses. No abnormality was noticed in Chromosomal aberrations and sperm abnormal aberrations in all trial groups\textsuperscript{63}. Swarnamakshika bhasma has shown significant results in biological parameters including increase in Hb%, decrease in serum cholesterol, triglycerides, VLDL level, and significant increase in bone marrow parameters like myeloid to erythroid ratio, Pronormoblast, and Reticulocytes\textsuperscript{64}.  

<table>
<thead>
<tr>
<th>Table 1 Properties of Swarnamakshika bhasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Rasa</td>
</tr>
<tr>
<td>Guna</td>
</tr>
<tr>
<td>Veerya</td>
</tr>
<tr>
<td>Vipaka</td>
</tr>
<tr>
<td>Doshaghata</td>
</tr>
<tr>
<td>Karma</td>
</tr>
<tr>
<td>Rogaghata</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 Reference of swarnamakshika in samhita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Sushruta</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Charaka</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Vagbhata</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Swarnamakshika is upadhatu of swarna and is rasayangrya. Procedures like shodhana and marana make the mineral biologically available to the body. Shodhana loosens bond, oxidize and solubilize impurities in liquid media (drava dravya). Marana reduce the particle size to nano level, impart veerya to aushadha and makes it compatible. Swarnamakshika bhasma contains Cu-S, CuO, Fe-S, SiO2 and trace amount of Mg, Zn, Mn, etc. Smaller particle size of bhasma enables rapid dissolution in the body fluids and quick digestion of the bhasma. Nano-particle size of the bhasma facilitates self-targeted activity. This proves vyavayi, viśkia guna of dravya. Nanoparticle improve drug delivery, the drug will be taken by cells more efficiently than larger one. It also gets cleared from the body easily. Swarnamakshika bhasma is a soumya kalpa of loka and tamra. It is swadu, tiktta, vruṣya, rasayana, yogavahi, (property inhibit iron absorption) etc.

REFERENCES


Sruthi Nambiar et al. Journal of Biological & Scientific Opinion • Volume 5 (5). 2017

Cite this article as:

Source of support: Nil; Conflict of interest: None Declared

Disclaimer: JBSO is solely owned by Moksha Publishing House - A non-profit publishing house, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the contents published in our Journal. JBSO cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of JBSO editor or editorial board members.