ISSN 2456-3110
Vol 6 · Issue 6
Nov-Dec 2021

JAiMS
INTERNATIONAL

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences

Maharshi Charaka
Ayurveda

Indexed

Journal of
Ayurveda and Integrated Medical Sciences
ISSN 2456-3110
REVIEW ARTICLE Nov-Dec 2021

A literary review of an Ayurvedic dosage form : *Naag Bhasma*

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ABSTRACT

All research work is totally based on literary survey, which takes place by collecting appropriate data from past, present& future based knowledge to ensure the subjective importance of research work. Throughout all the procedure in the field of research work, this method reveals about historical background of the study topic, which helps to summarise the complete knowledge related to the subject. In our Ayurvedic literature the *Bhasma Kalpana* has a special branch of medicine. But in present scenario we are dealing with many complications regarding heavy metal, which is used in *Bhasma Kalpana*. One of them is *Naagbhasma* which is noticeable by its lead toxicity effect. The factual data is useful to deal with such issues. Hence to overcome the myth related to *Naagbhasma* literary review plays important role by correcting the all procedure in the part of preparation. During review, it was found that *Naag* turned into PbO during *Jarana* process which is then converted to PbS group after performing *Puta* procedure. The final product of *Naagbhasma* is in sulphide form. This review may be useful in pharmaceutical processing & analysing the sample of *Naagbhasma* for achieving the standard protocol.

Key words: *Bhasma Kalpana, Naagbhasma, Lead toxicity, Standard protocol.*

INTRODUCTION

Rasashastra is deals with the metal & minerals uses with the herbal media. Earlier metals are used for *Dhatuvaad* (conversion of non-precious metals into precious metal) but later *Dehavaad* (conversion of heavy metal into *Bhasma* i.e., small particle size powder) uses also enlighten by scholars of *Rasashastra*. For the elimination of metal toxicity of many procedures are explained in texts of *Rasashastra* like *Shodhana, Maran* etc. These procedures are varying according to different schools of thoughts & according to their desired action on disease. To achieve the accurate dosage form, all steps involved in *Bhasma* preparation need to be followed correctly. Ideal *Bhasma* is said to be irreversible form, which is confirmed by *Niruttha* test mentioned in the texts.[1]

Naag (Pb) is one of the metals known for its toxicity. This issue can be eliminated by vigilant preparation of *Bhasma*. Information regarding various methods of preparation of *Naagbhasma* not only helpful in selecting the suitable method for pharmaceutical purpose but also useful in treating ailments. *Naagbhasma* is used in the treatment of *Prameha* (Diabetes), *Atisar* (diarrhoea), *Pandu* (anaemia), obesity & Aphrodisiac.[2]

The uses of *Naagbhasma* varies according to method followed while its preparation. This review is an attempt to explain the complete information according to different texts related to preparative aspect of *Naagbhasma*, its toxicity & clinical studies.

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Submission Date: 12/11/2021 Accepted Date: 18/12/2021

Access this article online

Quick Response Code

Website: www.jaims.in

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ISSN: 2456-3110 REVIEW ARTICLE Nov-Dec 2021

Aims and Objectives

Aim: To summarise the brief knowledge about *Naagbhasma.*

Objectives: To summarise the literary review about current situation regarding preparation, standardisation & toxic study according to different Rasa scholars.

Methodology

Textual as well as published literature on recent development in research related to *Naag Bhasma* considering various research articles published by scholars in Central Database of Pubmed, various national & international indexed journals were reviewed. The search criterion was restricted to preparatory methods, toxicological & clinical studies of *Naag Bhasma*.

Synonyms

According to various texts synonyms are mentioned here eg. *Naag, Sisak, Yogeshta, Vapra, Naagnamak, Sisaka, Sisa, Bhujanga, Ashivisha, Kuranga,* and *Sindurakarana*.[3]

History of *Naag*

Historical data is important tool for summarising the all aspect of the research topic. Therefore, to achieve the good work in the field of Ayurveda history is very important.

Vedic Kaal

In *AtharvaVedaNaag* is used for its *Krimghana* action.[4] In *Kautilya Arthashastra, Naag* is known as metal form.

Samhita Kaal

According to *Sushruta Acharya, Naag* were used in *Trapavadigana* & firstly *Naag* was used mostly for opthalmic aliments.[5] *Dalhan Acharya* also mentioned it in the treatment of *Abhishyanda* (conjunctivitis).[6] A Formulation named '*Timirantaka*' is mentioned by *Ashtang Hridaya* in which *Naag* is the main content.[7]

7th to early 20thcentury

During this period the *Naag* was used for preparation of gold & for silver purification. According to *Rasendra Mangal Naag* were used in many diseases like eye diseases, skin diseases etc. With the combination of other metals eg. *Suvarna, Lauha, Rajat, Tamra,* etc.[8] Hence it is also used as *Rasayana* purpose also. Author of *Rasopanishada* mentioned *Naag* as mild poisonous hence it suggested the use in precautionary basis.[9]

Further in the text *Rasarnava, Naag* was mentioned in eight of *Dhatu Varga*. [10] Incineration process of *Naag Bhasma* and has been mentioned in details. According to text *Rasendrachintamani* many *Kalpa* of *Naag* were mentioned *Talakeshwar Rasa*, *Ratnaprabha Pottalirasa* and *Naag* is described in brief manner & classified as *Puti Lauha*. In *Rasajalanidhi*,[11] 7 types of incineration process are mentioned & in *Rasakamadhenu* various formulations like *Pramehagajasimharasa*,[12] *Nagendragutika*, *Panchamritparpati Rasa*, *Laghupushpadhanwa* rasa, and *Vasantakusumakar Rasa* are mentioned. According to *Ayurveda Prakash* and *Rasa Tarangini* and *Rasamrit Naag* is prescribed in *Prameha* (diabetes mellitus).

Origin

It is found in the form of Galena which is obtained from mines. According to scholars' fictitious relevance related to origin of *Naag* is that, *Vasuki Sarp* is releases its *virya* after seeing beautiful girl of *Sarparaj Bhogi*. From this reference we can resemble that the *Vasuki* is narrow hollow vessels of mine & the girl is heat of mines. After coming in contact of heat, lead is expelled out from vessels of mines.[13]

Appearance

Lead is bluish grey heavy metal. It is malleable in nature. While drawing streak on the paper it produces black line. At the time of heating, it emits foul smell hence it is also known as *Putilauha*. On cut it shows bright grey lustre.

Types

According to text *Rasarnava* two types of *Naag* are mentioned i.e., *Kumar* and *Samala*.[14] But no one mentioned the any differences between them; hence both the types are used.

ISSN: 2456-3110 REVIEW ARTICLE Nov-Dec 2021

Purification

It is a process in which metal got converted into pure form which is free from Heavy metal toxicity & other adulteration elements by quenching method. *Naag* purification explained by different acharyas, which are summarized in table 1:

Jarana

After purification *Jarana* method is done with the help of herbal media to attain the soft small powder form of metal. It increases the heat stability & helps out to make finest particle size form after subjected to further Puta method. This procedure is not indicated every *Bhasma Kalpana*. Because of all methods varies from each other.

Marana

It is a process in which metal is converted in to crystalline particle size. After purification *Marana* was done explained by different *Acharyas*, which are given in table 2:

Apakwasevan Dosha & its treatment

According to *Acharyas* administration of impure form of *Naag* produces jaundice, nausea, giddiness, diabetes mellitus etc. According to scholars of *Rasashastra* impure & immature of *Naagkalpa* can be treated by ingestion of 1/8 *Ratti* of *Swarna Bhasma* with *Haritakichurna*& with *Sita* as *anupana* (adjuvant) for 3 days.[15]

Dose

Therapeutic dose of *Naagbhasma* is 1/4thratti to 1ratti is described in texts.[16]

Previous Research work done on *Naagbhasma*

Some resent research article was published earlier related to *Naagbhasma* which is comprises below:

In an experimental study on anti-hyperglycemic effect of *Naga Bhasma* (incinerated lead), *Naagbhasma* prepared by two methods, [17] Dhirajsingh Rajput *et al.* prepared *Naagbhasma* using *Parada* as 1st batch and herbal media of *Vasa* (07 *Puta*) methods. While conducting the animal experimentation for anti-hyperglycaemic activity moderate effects in both groups are observed. In the end author suggested to use number *Puta* for *Bhasma* preparation to get the significant results. Ashish Verma[18]*et al.* in his study 'Standardization of *Naagbhasma* prepared by two different *Bhavana Dravya* has mentioned that 10 *Putas* are sufficient to prepare *Naagbhasma*. Both the method shows similar result on the basis of analytical & pharmaceutical aspect. But using leaf juice of *Calatropis procera* is more convenient method to be followed in the large scale than the latex of *Calatropis procera* process. S. Nagarajan[19] in his study 'Scientific insight in the preparation & characterisation of Lead-based *Naag Bhasma'* showed the chemical transformation of *Naag* to different compounds. Just like quenching method in herbal media gives the fine product of *Naag* & After *Jarana* process the oxidized *Naag* converted to Pb2+ which is then turned in to nano crystalline nature of lead sulphide after repeated incineration process. Rahul Yashavanth[20] *et a.l,* in his study i.e*.,* Pharmaceutico-Analytical study of *Naagbhasma* prepared by two different method followed two methods for preparation of *Naagbhasma* i.e., *Jarit* & *Putpaka* method. According to method used and test result he concluded that *Bhasma* is formed easily & convenient using *Puta* than *Jarana* method. Praveen M. Tate[21] *et al.* in his study i.e., Pharmaceutical standardisation of *Naagbhasma* has demonstrated the *Bhasma* using two different methods (processed with mercury and another processed with *Manashila* & also found that all procedure is very important for preparation of *Naagbhasma* i.e., *Shodhan*, *Jarana* and *Putapak* etc. Both the method shows sulphide bond present with lead but the *Bhasma* processed with *Manashila* showed lesser particle size. S.K.Singh[22] Synthesis, Characterization and Histopathological Study of a Lead-Based Indian Traditional Drug: *Naga Bhasma* in his study he has shown that *Naabhasma* had the dose of 6mg/100gm/day used for study on rats was completely safe & no toxic effect were noted in histopathological report.

DISCUSSION

As explained earlier research work the *Naagbhasma* is very popular preparation in pharmaceutical level,

ISSN: 2456-3110 REVIEW ARTICLE Nov-Dec 2021

because of its low costing, easy method of preparation in comparisons of other metal, minimum man power etc. In the preparation of *Bhasma Kalpana* the trituration & *Puta* procedure is very important because of in trituration method is performed continue time period with proper pressure by which the physiochemically changes occurs. In *Puta* procedure, when number of *Puta* increases then accordingly prepared *Bhasma* becomes nano crystalline in nature.[23] After completion of preparatory process, *Bhasma* is tested on textual parameters like *Rekhapurwa, Varitartwa, Nirddhum* etc. especially *Apunarbhav* & *Niruttha*. These tests confirm the total transformation of *Naag* metal into *Bhasma*. It ensures non-recurrence of metal from the *Bhasma* form. With help of these tests, it is conformably declared that prepared *Naagbhasma* is safe when prescribed in therapeutic dose.

CONCLUSION

Regarding literary review of the drug is explained about the total information about that drug. In this study two types of *Naag* were explained but there is no difference is found in both of them. Hence any one of them is taken for preparation of *Naagbhasma*. According to different *Acharyas Naagbhasma* preparation was explained. e.g. a collection of brief knowledge of *Shodhana*, *Maran*, *Apakwa Sevandosha* & *Nivarana*, *Matra* were described. Throughout all process up to making of *Naagbhasma* many changes occurs but the final main content is same in all different type of preparation technique i.e., Lead sulphide. As number of *Puta* is increased the particle size decreases which ensure the good bio assimilation power in it. *Naagbhasma* is indicated in Diabetes, obesity, skin disease, eye diseases & it is aphrodisiac in nature.

Table 1: Different purification methods of *Naag* mentioned in Rasashastra texts.

SN	Media used for Purification	Reference	Method	Repeated period
1.	*Nirgundi Patra Swarasa (Vitex negundo), Haridra Churna (Curcuma longa)*	*Rasamrut*[24]	*Dhalana (Quenching)*	3 times
2.	*Dhatu Samnya Shodhan (Tailam, Takram...)*	*Ayurveda Prakash*[25]	*Dhalana*	7 times
3.	*Nirgundipatraswarasa,Haridra churna*	*Rasendra Chudamani*[26]	*Dhalana*	3 or 7 times
4.	*Gomutra, Kulatthakwath (Macrotyloma uniflorum), Ravi dugdha, Til Tailam*	*Sharangdhar Samhita*[27]	*Dhalana*	3 times
5.	*Nirgundi Patra Swarasa, Haridra Churna*	*Rasaprakash Sudhakar*[28]	*Dhalana*	7 times
6.	*Kumari Swarasa (Aloe vera), Gajamutra, Ravidugdha, Triphalakwath*	*Rasendra Puran*[29]	*Dhalana*	7 times
7.	*Nirgundi Patra Swarasa Nirgundibeej* or *Mula Churna*	*Rasaratna Samucchaya*[30]	*Dhalana Bharjana*	3 times
8.	*Ravi Dugdha, Churnodak (Lime water)*	*Rasendra Saarsangrah*[31]	*Dhalana*	7 times
9.	*Nirgundimula Swarasa, Churnodak*	*Rasa Tarangini*[32]	*Dhalana*	7 times

Table 2: Different *Maran* methods of *Naag* mentioned in *Rasashastra* texts.

SN	Media used for Maran	Reference	Colour	No. of Puta
1.	*Parad (Mercury), Khaskhas (Papaver somniferum) seed churna, Manshila*	*Rasamrut*[33]	-------	7 times
2.	*Manshila, Ashwathha (Ficus riligiosa), Vata, Arkachurna (Calatropis gigantia),*	*Ayurveda Prakash*[34]	*Sindur*	3

ISSN: 2456-3110 REVIEW ARTICLE Nov-Dec 2021

	Palash (Beutea monosperma)			
2.	*Bhunag, Vasa (Adhatoda vasica), Agasti churna (Sesbania grandiflora), Manashila*	,,	*Sindur*	7
2.	*Manashila*	,,	-------	32
2.	*Vasa, Manashila*	..	-------	1
2.	*Manashila, Gandhaka,*	,,	-------	3
2.	*Ashwatthatwak & Chincha (Tamrindus indica) Churna, Manashila*	,,	-------	60
3.	*Kshar of Apamarg (Achyranthes aspera), Arjun (Termanalia arjuna), Aragvadha (Casia fistula), Dadim (Punica granatum), Parad*	*Rasendra Chudamani*[35]	*Kapot or Rakta*	------
4.	*Manashila, Tambulswarasa (Piper betel)*	*Sharangdhar Samhita*[36]	-------	32
5.	*Vasa, Manashila*	*Rasaprakash Sudhakar*[37]	-------	3
6.	*Kumari, Hingul, Manashila, Gandhak*	*Rasendra Puran*[38]	*Rakta*	100
6.	*Bhunaag, Vasa, Apamarga, Agasti*	,,	*Sindur*	7
6.	*Manashila, Gandhak, Kumkum, Karpur (Dryobalanops aromatic)*	,,	*Peeta*	60
6.	*Ahiphen (Papavar somniferum)*	,,	*White*	-------
6.	*Arkamula Churna*	,,	*Harit*	-------
6.	*Ashwattha, Chincha Twakchurna, Manashila*	,,	-------	6
6.	*Manashila, TanduliyaSwarasa*	,,	-------	7
6.	*Manashila, Vasa Swarasa*	,,	-------	3
7.	*Chincha & Ashwattha churna, Manashila*	*Rasaratna Samucchaya* [39]	-------	60
7.	*Dadim, Aragvadha, Apamarga & Arjun Churna*	,,	*Kapot or Rakta*	-------
7.	*Manashila, Ravi Dugdha*	,,		3
8.	*Bhunag, Vasa swarasa, Kshar of Apamarg & Agasti, Vasaswarasa*	*Rasendra Saarsangrah* [40]	*Sindur*	7
9.	*Vasa, Apamarg, Manashila*	*Rasa Tarangini*[41]	*3*	*Kajjal prabha*
9.	*Parad, Gandhak*	,,	-------	*Kajjal prabha*
9.	*Ashwattha Twak Churna, Manashila*	,,	*3*	-------
9.	*Manashila, Gandhak*	,,	*3*	-------
9.	*Ashwatth & Apamarg Churna, Hartal*	,,	*3*	-------
9.	*Mashila & Ravi dugdha*	,,	-------	-------
9.	*Gandhak churna*	,,	-------	-------

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ISSN: 2456-3110 **REVIEW ARTICLE** Nov-Dec 2021

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How to cite this article: Shivani Manoj Tripathi, Ranjeet Satyawan Sawant. A literary review of an Ayurvedic dosage form : Naag Bhasma. J Ayurveda Integr Med Sci 2021;6:164-170.

Source of Support: Nil, **Conflict of Interest:** None declared.

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