Research Article

www.ijrap.net (ISSN:2229–3566)

IMPORTANCE OF SHODHANA WITH SPECIAL REFERENCE TO SAMANYA SHODHANA OF TAMRA

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Received on: 19/12/20 Accepted on: 05/02/21

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DOI: 10.7897/2277-4343.120111

ABSTRACT

Rasa Shastra is a branch of Ayurveda, which deals with the uses of drugs originated mainly from metals and minerals substances like Tamra Bhasma. Raw Tamra may contain impurities, heterogeneous and unwanted qualities. Aim of Shodhana is to make it purified and make it free from toxicity and suitable for the body. In this study Shodhana of Tamra was performed by classical method mentioned in Rasa Ratna Samucchya. In this process for Samanya Shodhana of Tamra. It was heated and after red hot it was quenched for 7 times in Tila Taila, Takra, Gomutra, Kanji and Kulattha kwatha in order. Total weight loss of Tamra after Samanya Shodhana was 13.33%, which shows removal of impurities. Literally, Shodhana is a procedure of elimination of Doshas in a drug. After Shodhana Loss on weight of Tamra, pH and colour changes of all liquid media were observed.

Keywords: Shodhana, Purification, Tamra.

INTRODUCTION

Rasa Chikitsa is the best therapy among others due to quicker recovery from disease and effective in even very small doses. In Rasa Shastra metals are converted into Bhasma for internal consumption by processing them through various processes like Shodhana, Marana etc. and then used in treatment of various diseases. These procedures not only decrease the possible harmful effects of metals but also said to increase their bioavailability and thus efficacy[1].

The number of metals found in nature is abundant. But only a few of them are recognized to possess medicinal properties. According to ancient scholars all these metals were termed under Dhatu (metal). Metals are used in the form of Bhasma, after procurement of metal; these are made into coarse powder by hammering. Then these are subjected to Shodhana (purification), Marana (Incineration) and Amritikarana procedure according to traditional Ayurvedic references[2].

Most of the raw materials used for preparation of Bhasma in Rasa Shastra are mineral/metal in origin. Hence, there may be a chance of impurities, heterogeneous and unwanted qualities to a large extent. The pharmaceutical procedures of Bhasma involves Shodhana (purification/processing), Bhavana (trituration), Puta (heating) and Marana (incineration) carried out over a medicinal drug with the intention of getting it purified and make them free from toxicity and suitable for the body[3]. Tamra has been classified in Sapta Dhatu Varga[4,5] and Suvarnadi Varga[6].

Concept of Shodhana

All the pharmaceutical procedures such as washing (Kshalana), trituration (Bhavana), heating and dipping (Nirvapana) etc. carried out over a medicinal drug with the intension of getting it purified is called Shodhana. The process of Shodhana includes both physical as well as chemical purification of the drug[7].

Types of Shodhana

Samanya Shodhana (General purification)

It is a common procedure used for drugs of a particular group where the drugs of a particular group are subjected to the similar procedure though individually.

Vishesha Shodhana (Specific purification)

It a specialized technique or procedure employed for a single particular drug individually[8].

MATERIALS AND METHODS

In this study Samanya Shodhana of Tamra was done as per mentioned in Rasa Ratna Samucchya[9].

Equipment

Stainless steel bowls, tongs (Sandasi), Angardhanika, weighing machine, pyrometer, spatula etc.

Ingredients

Raw Tamra 400 gm, Tila taila, Gomutra**,** Kanji**,** and Kulattha Kwatha: Q.S.

Procedure

Raw winding copper wire was procured from local market and folded in loop. Raw Tamra wire was taken on long handled

stainless-steel ladle and heated on Angardhanika until its red hot and quenching them subsequently into Tila Taila, for seven times than Takra, Gomutra, Kanji and Kulattha Kwatha, for seven times in each. After complete heating it was immediately quenched in liquid media. After collection of Tamra from the liquid media it was then washed with hot water and dried. Same procedure was repeated for 7 times. Each time fresh and same number of liquid media was taken in stainless steel bowls. Weight of Tamra and volume of liquid media was noted after completion of quenching in each liquid media. Total duration for Shodhana was 5 days.

Figure 1: Samanya Shodhana of Tamra

RESULTS

Observations

A. During Shodhana in Tila Taila

In Tamra: Colour of Tamra became reddish to black. Metallic lustre of Tamra was lost. Some part of Tamra got powdered during first phase of heating after 7th time Quenching. Weight of Tamra was found increased, though it was washed with hot water**.** Some oil was still sticking to it.

In media: Color of oil became light yellow to light brown. Oil became more viscid after Shodhana. Oil caught fire with dense fumes during quenching. A pungent smell and a rush of black fumes were observed after quenching.

B. During Shodhana in Takra

In Tamra: It got fire during first heating, but did not get fire in next heating.

In media: It started to boil during quenching. It separated in solid and liquid parts during quenching and solid part got settled down. Smell of burning of milk was coming out during quenching. Fine particles of Tamra which were suspended in Takra were difficult to collect due to thickness of Takra.

C. During Shodhana in Gomutra

In Tamra: Colour of Tamra became blackish grey to brown. Some Tamra wire was broken into small pieces. Some part of Tamra became coarse powder. Brittleness of Tamra pieces was increased after Shodhana.

In media: Colour of Gomutra became yellowish to brownish. A pungent smell was coming out during quenching. Urine started to boil during quenching. During quenching it started boiling in the vessel.

D. During Shodhana in Kanji

In Tamra: Colour of Tamra became brown to blackish brown. Flakes became more brittle and were transformed to more coarse powder form. Powder of Tamra accumulated together during heating.

In media: Colour of Kanji became Milky white to Milky white with black tinge.

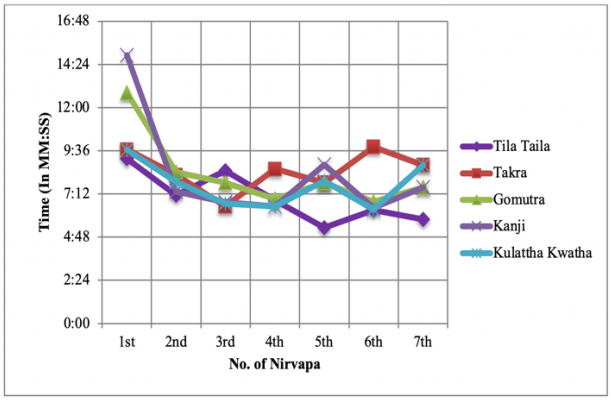
E. During Shodhana in Kulattha Kwatha

In Tamra: Colour of Tamra became blackish brown to deep brown. It became more in coarse powder form. Some powder flew away from the vessel due to vapours of decoction during quenching.

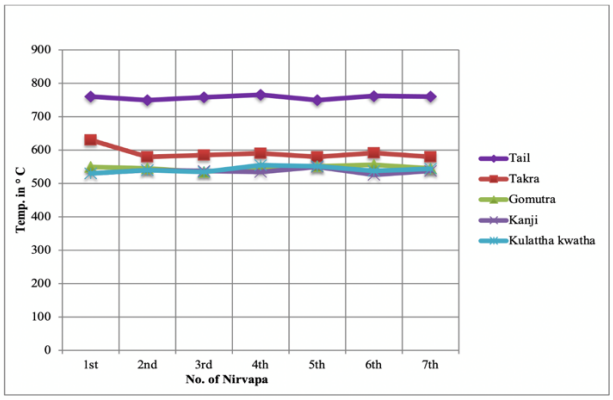
In media: Colour of Kulattha Kwatha became brown to bluish brown. Its consistency became thicker. It started to boil during quenching. A specific obnoxious smell was coming out during quenching.

Table 1: Avg. values of each Nirvapa during Samanya Shodhana

Media	Observations	Serial number of Nirvapa							
		1st	2nd	3rd	4th	5th	6th	7th	Avg.
Tila Taila	Time taken by Tamra Patra to become red hot (MM:SS)	9.10	7:08	8:30	6:50	5:20	6:18	5:48	**7**
	Temp. of Tamra recorded at red hot state (ºC)	760	750	758	766	750	762	760	**758**
	Temp. of Tila Taila immediately after Nirvapa (ºC)	93	86	88	89	91	87	95	**89.85**
Takra	Time taken by Tamra Patra to become red hot (MM:SS)	9:40	8:15	6:30	8:35	7:50	9:48	8:48	**8:49**
	Temp. of Tamra recorded at red hot state (ºC)	630	580	585	590	580	592	580	**591**
	Temp. of Takra immediately after Nirvapa (ºC)	85	84	85	95	80	95	90	**87.71**
Gomutra	Time taken by Tamra Patra to become red hot (MM:SS)	12:50	8:25	7:50	6:55	7:50	6:46	7:34	**8:30**
	Temp. of Tamra recorded at red hot state (ºC)	550	545	535	550	552	556	545	**547.57**
	Temp. of Gomutra immediately after Nirvapa (ºC)	85	87	84	81	80	89	86	**84.57**
Kanji	Time taken by Tamra Patra to become red hot (MM:SS)	14:55	7:20	6:45	6:30	8:50	6:26	7:34	**8:25**
	Temp. of Tamra recorded at red hot state (ºC)	530	540	538	535	550	526	538	**536.71**
	Temp. of Kanji immediately after Nirvapa (ºC)	79	85	86	84	78	88	81	**83**
Kulattha Kwatha	Time taken by Tamra Patra to become red hot (MM:SS)	9:40	7:52	6:40	6:30	7:55	6:20	8:48	**6:82**
	Temp. of Tamra recorded at red hot state (ºC)	530	540	535	555	552	538	544	**542**
	Temp. of Kulattha Kwatha immediately after Nirvapa (ºC)	78	82	77	85	83	86	81	**81.71**



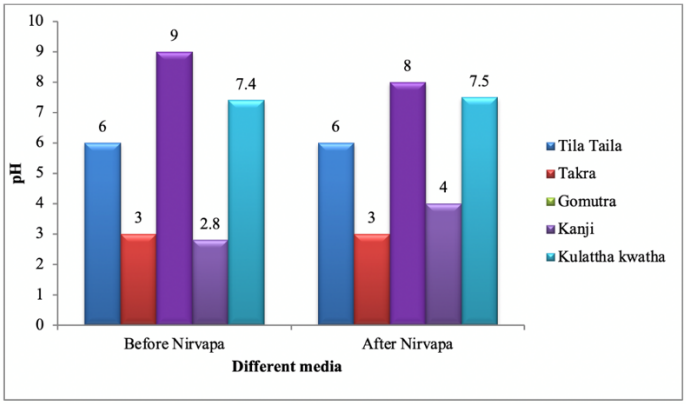
Graph 1: Time duration during Samanya Shodhana of Tamra



Graph 2: Temperature duration during Samanya Shodhana of Tamra

Table 2: The changes in media in Samanya Shodhana

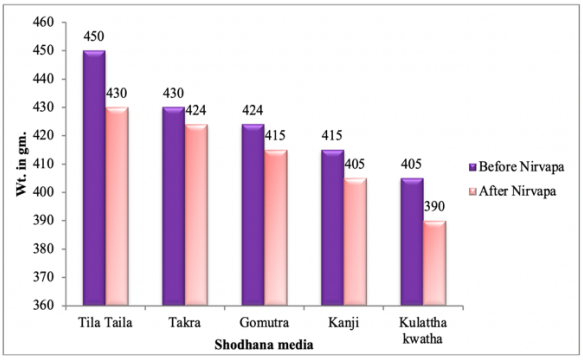
Media	Media Quantity (in litre)		pH of media		Colour of media	
	Initial	Final	Initial	Final	Initial	Final
Tila Taila	10	9.5	6	6	Yellowish	Brownish
Takra	10	9	3	3	Milky white	White
Gomutra	10	8.5	9	8	Light Brown	Dark brown
Kanji	10	9	2.8	4	White	Greyish
Kulattha Kwatha	10	9.5	7.4	7.5	Brown	Blackish brown



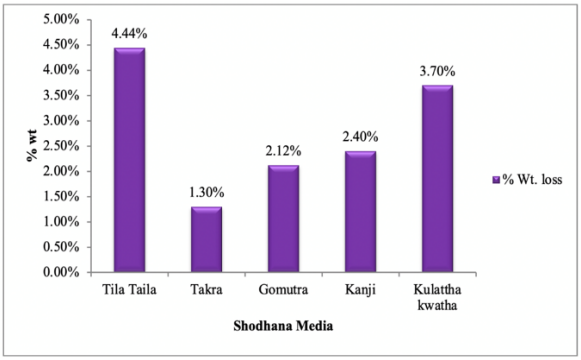
Graph 3: Changes in pH of each Media during Nirvapa

Table 3: Changes in weight of Tamra after 7 Nirvapa in each media

Wt. of Ashuddha Tamra taken for Shodhana (g)	Wt. of Tamra ↑/↓ after 7 Nirvapa (g)									
	Tila Taila		Takra		Gomutra		Kanji		Kulattha Kwatha	
	Wt. (g)	Wt. (%)	Wt. (g)	Wt. (%)	Wt. (g)	Wt. (%)	Wt. (g)	Wt. (%)	Wt. (g)	Wt. (%)
450	430	4.44↓	424	1.3↓	415	2.12↓	405	2.40↓	390	3.70↓



Graph 4: Avg. weight loss of Tamra during Samanya Shodhana



Graph 5: Avg. weight loss % of Tamra during Samanya Shodhana

Table 4: Loss in weight of Tamra after Samanya Shodhana

Wt. of Ashuddha Tamra taken for Samanya Shodhana (gm)	Wt. of Shuddha Tamra obtained after Samanya Shodhana (gm)	Wt. loss (gm)	Wt. loss (%)
450.00	390	60	13.33

DISCUSSION

At the end of Samanya Shodhana there was 13.33% loss of weight in Tamra. The reason for the loss might be predicted as the removal of impurities from the Tamra. Tila Taila have Snigdha, Sukshma and Ashukari properties, by these properties it may easily and rapidly enter into the material through the cracks and intermolecular space and makes film coating and further heating causes chemical reaction, compound formation and breaking of the material. Organic principles (liquid and solid fats, PUFA etc.) present in Tila Taila may induce organic property to Tamra. Takra is having Tikshna, Sanghata-Bhedana and Shithilikaran properties. It is acidic in nature and it removes Snigdhata imparted by Tila Taila. By these properties it may cause softening and breaking of the material. Gomutra have Ksharana and Pachana properties. So, it may cause worn-out of the material, and this way it may cause eradication of undesired substances from the material. Kanji is also having Tikshna, Bhedana properties and may cause softening and breaking of the material. Kulattha Kwatha has Ashmari Bhedana property. By this property it may cause breaking of the material. These liquid media act as cooling media during process of Nirvapa; these may serve a favourable atmosphere to the material for occurrence of particular chemical reaction and compound formation. These may enter through the cracked surface of the material and cause film coating and further heating leads to breaking of the material. They may also act as source of inorganic traces. Chemical analysis for the constituents of liquid media needs to be done for understanding the exact changes happening during the process. The pH of all the 5 media was noted by using pH paper strip, both before and after Nirvapana. The pH of above media before Nirvapana was 6, 3, 9, 2.8 and 7.4 respectively. In the first and last media the pH was towards neutral, the 2nd and 4th media were acids whereas the 5th one was alkaline in pH. After Shodhana, the pH of the media was 6, 3, 8, 4 and 7.5 for Taila, Takra, Gomutra, Arnala and Kulattha kwatha respectively. The colour change was observed in the media, yellow coloured Tila Taila turned to brownish. Takra which was milky white turned to greenish white colour. Gomutra which was light brown turned to dark brown with black particles. Arnala colour was white, turning to greyish. The Kulattha kwatha which was brown turned to blackish brown. The black particles might be the carbon particles which were formed during heating. The change in pH and colour change in the media is suggestive of the release of impurities into media. There was marked

difference in the pH of Arnala before and after Shodhana, which can be assumed that there was more release of impurities into this media. As per Bhava Prakasha, Tila Taila has the Gunas such as Tikshna, Ushna, Shroto Shodhana, Lekhana, Vyavai, Vikasi etc. These properties might act on Tamra which help in increasing the brittleness and make Tamra finer.

The Tamra was subjected to direct flame in the 1st media. As the brittleness increased and Tamra became powdery, the heating was done in an iron pan from the 2nd media. This suggests that the combined effect of heating, followed by sudden quenching in different media, disintegrate Tamra into fine particles. Tamra was heated up to completely red-hot state. Because at the red-hot state of Tamra desired changes take place (copper is converted to oxide of copper at red hot state by reacting with atmospheric oxygen). After heating it was instantly quenched in the liquid media. Instant quenching is important because repeated immediate cooling after heating leads to breaking of the material. It is discussed earlier in concept of Shodhana.

The alternate heating and quenching in these acidic and basic liquid media lead to corrosive changes in the metal and also may cause removal of acid and alkali soluble impurities from the metal. It should also be noted that these media were among the naturally and easily prepared source of acid and base at the ancient time.

Some theories may explain the use of Gomutra in Samanya Shodhana. During red hot state of the metals and minerals volatile chemical impurities like arsenic are removed completely. Some metals and minerals during red hot state react with atmospheric oxygen or steam and form chemical compound. So, during red hot state immediate quenching in liquid media is important; it facilitates chemical reaction in the media whenever the materials remain red hot[10,11].

CONCLUSION

Total weight loss of Tamra after Samanya Shodhana was 13.33%, which shows removal of impurities. Literally, Shodhana is a procedure of elimination of Doshas in a drug. The term Dosha indicates not only impurities but also all that which makes the drug unsuitable for further process or therapeutic use. Without the prior removal of impurities, no medicine can be prepared, so that Shodhana of every substance utilized in Rasa Shastra is described at the very beginning. Even common substance like alum when administered in impure form give rise to several diseases and upon the administration of the same in purified form, they produce marvelous therapeutic results.

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Cite this article as:

Archana Sahu *et al*. Importance of Shodhana with special reference to Samanya Shodhana of Tamra. Int. J. Res. Ayurveda Pharm. 2021;12(1):43-47 http://dx.doi.org/10.7897/2277-4343.120111

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