

COMPARATIVE STUDY OF MEDIA IN THE PREPARATION OF *TAMRA BHASMA* WITH SPECIAL REFERENCE TO *TAMAKA SVASA*

D. S. WADODKAR, K. U. PILLAI and H. S. SARMA

Department of Rasasastra & Bhaishajya Kalpana, Institute of Post-Graduate Teaching and Research, Gujarat Ayurved University, Jamnagar-361 008, Gujarat, India.

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ABSTRACT: Three types of tamra bhasmas separately prepared by using the media of mercury, *Solanum xanthocarpum* and sulphur were tested in patients of tamaka svasa. Results suggest that the process of making tamra bhasma with sulphur is superior to others due to several reasons.

INTRODUCTION

A review of ayurvedic literature reveals that media play an important role in the preparation of **bhasmas**. According to Rasavagbhata, **bhasmas** of the metals prepared by the media of **rasabhasa** are superior one, by the media of herbals are of middle standard, by the media of **gandhakadi** minerals are of lower category¹ and by the media of **ariloha** are causing impaired or ill effects.

At present physicians as well as manufacturers are indiscriminate about the use of media in the incineration of a particular mineral. They concentrate only upon the nomenclature of the product as **Tamra Bhasma**, **Vanga Bhasma** etc. It is high time to establish the effect of media in the incineration as well as the quality of product accordingly.

The qualitative gradation shown by Rasavagbhata also gives rise to a basic doubt whether this gradation is according to therapeutic qualities or alchemical utility. Hence the present study is planed in such a way that it involves pharmaceutical as well as clinical aspects regarding the study of media.

Tamaka svasa is a commonly occurring disease in India. Most of the Rasacaryas have indicated **Tamra bhasma** in **Tamaka Svasa**. However as a single drug its efficacy in this disease is not yet clinically confirmed. Hence in the present study **Tamaka Svasa** is undertaken to test the comparative efficacy of **tamra bhasma** prepared by different media.

MATERIALS AND METHODS.

The present study is carried out in three phases viz.

- A – Literary Survey
- B – Pharmaceutical Study and
- C – Clinical Study

Literary Survey

Literary compilation regarding different aspects of **tamra** has been made after envisaging several authentic texts of **Rasasastra** as well as the books of Western System of medicine. The theoretical compilation has been limited to avoid repetition but an effort has been made to highlight untouched aspects of previous

studies. The historical background and developmental stages of the use of media are the subjects of importance regarding this study. While commenting upon the developmental aspects, the lack of perfect chronological order of **Rasasastra** books was confusing. Though deciding the chronology was not the task of present study an effort has been made to follow utmost correct chronology after entertaining the opinions of different chroniclers.

In this study the methods of **tamra sodhana**, **marana**, **amritikarana** are compiled and tabulated in chronological order. 53 **tamra marana** process are studied in detail. Modification and alternations regarding the material used, heat given, method of heating and duration of process are noted individually in each process. The repetition of the specific **sodhana**, and **marana** processes is also separately listed to judge the wide acceptance of the process.

Similarly 204 important **Rasayogas** indicated for **svasa** were investigated to study the preference given to copper in this disease. The study revealed that out of 204 **Rasayogas** 106 contain copper, thus indicating the importance of this metal in **Svasa**.

Tamra Sodhana

In the present study 2 kg of copper wires used in electric motors were subjected to general and special **Sodhana** in bulk. The **Sodhana** was performed according to **Rasaratnasamuccaya**². Total 540gms. of copper was lost during general and specific **Sodhana**. The heavy loss in the weight of copper was due to the fact that, fine powder of copper formed in the process was mixing homogenously in the liquid and it was very difficult to collect the power completely.

Three types of **tamra bhasmas** were separately prepared from the purified **tamra**.

Tamra Marana

After studying several authentic textis of **Rasasastra** three processes were selected for the preparation of **tamra bhasma**. An effort has been made to select such processes which are strict about the purity of media. Due importance was also given to economy and simplicity of the processes. Taking all the above said aspects into consideration the following processes were selected for the present study.

- I) Purified Copper 1 part + Purified Mercury 2 part + Sugar 1 part. – Trituration along with lemon juice and three **putas**³
- II) Purified Copper 1 part + Purified Sulphur 2 parts – **Ghati Yantra** process⁴
- III) Purified Copper + Juice of **Solanum xanthocarpum** - Trituration and three **Putas**⁵

In process No. I – high grade crystalline sugar of 0.07% ash value was used. The rationale behind the selection of this process was that as the process of **tamra marana** with **rasa bhasma** as a media was not found, the alternative was to select such a process where mercury is predominant and the interference of other substances is less. The processes no. II & III are simple and keep the purity of media.

Out of these three **tamra marana** processes, processes, process no. I was unsuccessful. The lack of information regarding the type of **puta** was the main difficulty faced in this process. The final product was subjected to **bhasma pariksa** which stood negative in all the tests. So the process was supposed as

unsuccessful and the product was discarded from clinical studies.

By the media of sulphur in process no.II **tamra bhasma** was obtained in just 10 hours. In this process 300gms. of purified copper powder and 600gms. of purified sulphur were used. The fineness of copper powder used in this process was ranging from 60 no. mesh to 120 no. mesh. After 10 hours of heating on gas stove the earthen pot was allowed to cool. Then the material inside was taken out and subjected to **bhasma pariksa** which stood positive. As a general tradition the **bhasma** was subjected to **amrtikarana**⁶ process but the result was unexpectedly bad. Then the **bhasma** was corrected using original method of **tamra marana**. It was tested and administered in patients.

In the process no. III only juice of **S.xanthocarpum** was used as a media for **tamra marana**. In the text 3 **putas** are suggested for this method. After 3 **gajaputas** the product was subjected to **bhasma pariksa** which failed to fulfill the required criteria. So 3 more **gajaputas**, 2 **ardha gajaputas** and 1 **laghuputa** were given. After 9th **puta** the **bhasma** stood positive in the required tests. It was subjected to **amritkarana** process (6). But the attempt to improve the qualities was futile. So the original method of triturating with juice of **S.xanthocarpum** and giving **puta** was adopted. At this time only 25 cow dung cakes (3.5 kg.) were used to give **puta**. In this way six **putas** positive in

required to stand the **bhasma** positive in required tests. Then it was administered in patients.

During **sodhana, marana** and **amritkarana** samples were collected on every stage for analytical studies.

Comparative Assesment of the Processes

Any method of preparation of drug can be considered good when it is simple, economic, time saving, requiring easily available materials to conduct the process, gives high yield and is effective.

On these grounds the **tamra marana** processes are compared here. The process No.I where mercury was used as a media was unsuccessful, hence the process is omitted from the comparison. The process No. II and III are compared (Table No.1). It is clear from the table that **tamra bhasma** prepared by sulphur media is better.

Clinical Study

To evaluate the comparative clinical efficacy of **tamra bhasma** prepared by different media, samples of those **tamra bhasmas** were tested in 24 patients of **tamaka svasa** in two different groups. Group I comprised 17 patients. In this group **tamra bhasma** prepared by sulphur media was administered. Group II comprised 7 patients who were treated with the **tamra bhasma** prepared by **Kantakari** media.

TABLE 1
Tamra Marana Processes

PARTICULARS	SULPHUR MEDIA	S. XANTHOCARPUM MEDIA
REFERENCE	RASENDRA SAMPRADAYA	SANAT-AKABARA
Simplicity	Most simple	Simple
Availability of required	Purified Sulphur is available	S.xanthocarpum is easily

material		available in India
Duration	Requires just 10 to 14 hrs.	Requires near about 30 to 45 days if carried out continuously without break
Yield	High yield (Initial wt.of Tamra 300gm.wt. of final product 413gm.	Poor yield (Initial wt. of Tamra 400gm.wt.of final product 280gms).
Economy	Most economical	Comparatively less economical.

Selection of Patients

The patients were selected irrespective of age, sex, occupation, duration of illness or severity. The patients were treated at both in-patient and outpatient levels. Ayurvedic symptomatology **Tamaka Svasa** was the main criteria for the selection of patients.

Mode of administration of drug

In both the groups, **tamra bhasma** in a dose of 125mg. was administered along with honey thrice a day. In case of an acute attack 125mg. dose was repeated. No other medicines were used for the management of acute attack. In one child patient 60 mg. dose was given 3 times a day.

Duration of treatment

The duration of treatment in both the groups was fixed to 21 days.

Dietary restriction

The patients were allowed to continue their routine diet.

Criteria for assessment of results

The criteria for the assessment of results were based on the severity of signs and symptoms before and after treatment as well as on the changes revealed by laboratory investigations. These investigations include hematological investigations, routine urine

and stool exam, sputum analysis specially for **A.F.B.** eoinophils, Charcotleyden crystals. Cushman's spirals etc., P.E.F.R. and radiological investigations.

Initially 21 patients were registered in group I. Out of them only 17 could complete the course of treatment satisfactorily, while in group II, 11 patients were registered and 7 completed the course of treatment .

The **tamra bhasma** of sulphur media was prepared earlier hence the group I has more number of patients. Even after utmost efforts **tamra bhasma** of **Kantakari** media could not be prepared earlier resulting in less number of patient in group II due to lack of time. Results relief in signs and symptoms of **tamaka svasa** was the main criteria for the assessment of results. Total 34 signs and symptoms of **tamaka svasa** mentioned in different authentic books were considered in this study.

In both the groups good symptomatic relief was obtained. In following symptoms Group I medicine was more effective.

Insomnia, Chest pain, severe Paroxysms of cough, catching of neck, great affliction to vital breath, frequent coughing, rapid respiration, dryness of mouth, excessive sweating, catching of head, relief by decrease of cough, difficulty in expectoration, fever, relief on expectoration, etc. Group II medicine was more effective in

Debility, Orthopnoea, liking for hot things, irritation in throat etc.

In following symptoms **tamra bhasmas** of Group I and Group II were equally effective: Loss of appetite, fainting due to coughing, difficulty in speaking, wheezing, lateral chest pain, anorexia, great distress, sweating over forehead, dyspnoea with vomiting, dyspnoea with tremors, lateral heaviness in chest on lying etc.

Table 2
Weekly assessment of average symptomatic relief in Group I and Group II

	Percentage of Relief		
	I st week	II nd week	III rd week
I.	66.78	93.66	96.32
II.	33.73	76.25	90.87

CONCLUSION

On the basis of the findings collected during this study a conclusion is drawn which is as follows:-

1. The literary review revealed that ancient Indian **Acharyas** were well familiar with the therapeutics of **tamra** including its toxicology and antidotes. The Indians were the first scientists to realize the therapeutic importance of copper.
2. Literary compilation of **tamra marana** processes has shown that ancient **Acharyas** were not strictly following the purity of media. They have given much emphasis on the qualitative enhancement of the **bhasmas** rather than the purity of media.
3. As far as the purity of media is concerned, some processes are found. Where pure herbal media or sulphur media is used for **tamra marana**. However, pure herbal media is rarely described.

In general in both the groups good systemic relief has been obtained. In group I the average symptomatic relief was 96.32% whereas in Group II it was 90.87%. As the difference in the total symptomatic relief in both the groups is not so remarkable, the speed of recovery in compared to assess the results (Table No.2)

4. In our survey no such processes is found where **rasa bhasma** alone is stated is found where **tamra marana**. But in many processes mercury is used along with sulphur or other drugs.

5. The literary compilation has shown that most of the **Acharyas** have advocated **Culhikagni (Kasthadi janya agni)** for **tamra marana**. The practical experience of this study also shows that low heat gives good results. Hence reconsideration of the tradition to use **gajaputa** for **tamra marana** where specific name of **puta** is not mentioned, seems to be necessary.

6. The difference of opinions regarding the chronological order of **Rasasastra** books creates great confusion while commenting upon the developmental aspects of media or **marana**.

7. It is found that, a fine powder of copper which can pass through 120 No. mesh can be obtained from the Sodhana processes if done properly.

8. In this study it is found that **tamra marana** by **S. xanthoparpum** media is a simple process but the process of sulphur media is the simplest one.

9. In this study it is experienced that only quantity of fuel either by weight or number of cowdung cakes cannot be a criterion for

the standardization of the heat of different Putas, but the quality and calorific value of fuel should also be considered. It is also necessary to fix a standard range of temperatures in different **putas** by adopting sophisticated methods.

10. After comparing the results of chemical analysis with the results of **bhasma pariksa**, it is observed that the sample which was positive in curd test contained no free copper whereas the sample which was negative in the cured test, showed free copper in the chemical analysis. To keep the standard the curd of 3.5 pH was taken for this test.

11. **Tamra bhasa** in general shows remarkable results in **tamaka svasa**. The total symptomatic relief observed by the **tamra bhasma** of sulphur media and **S.xanthocarpum** media is near about same i.e. 96.32% and 90.87% respectively.

However regarding the speed of recovery, changes in 24 hours sputum volume and P. E. F. R., **tamra bhasma** of sulphur media has shown highly significant results as compared to **tamra bhasma** of **S.xanthocarpum** media.

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12. As far as the Rontgenographic investigations are concerned both the **tamra bhasma** have shown good radiological results in some patients. In both the groups, after administration of **tamra bhasma** significant number of patients have shown increase in W.B.C. count neutrophilic and absolute eosinophilic count; but these patients were clinically improved. Though the increase in the values seems to be statistically insignificant it should not be neglected. Active research regarding the action of copper on immunity system is highly necessary.

The role of media in the incineration is so vast a topic that further research work is necessary to highlight all the aspects. The present study may prove a guideline for future workers.

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