Research Article

ANTI-PYRETIC ACTIVITY OF SRIRAMA RASA IN ALBINO RATS

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Jwara appears as an independent disease and also as a Lakshana of various diseases. Because of this, it is the common health problem met within medical practice. That is why, Ayurveda gives much importance to Jwara and considered Jwara as Sarvarogaadhipati.

Abnormal food habits, style of living etc. factors disturb Jatharagni and health, which leads to Jwara and Vedana. Srirama Rasa is a unique herbo-mineral formulation explained in the Jwara Chikitsa Prakaranam of Bhaishajya Ratnavali having a multi-dimensional therapeutic action i.e., Ama jwara, Shoola, Vishtambha and Vata vikaras. It is a potent formulation having Shuddha Parada, Shuddha Gandhaka, Shuddhajayapala Beeja and Maricha given Bhavana with Dantimoola kwatha.

Methodology: Raw materials were screened and collected and the formulation selected for the present study Srirama Rasa was prepared accordingly. Experimental study was conducted in 3 group of animals for Anti-pyretic study. Anti-pyretic study was done by Yeast induced pyrexia method in Albino rats.

Results: In Anti-pyretic study, a significant result was observed in standard group and trial group. But in standard group, it was more significant than control & trial group. In trial drug, a significant decrease in rectal temperature was observed from 5th to 6th hr, while in standard group it was from 2nd to 6th hr.

Conclusion: Srirama Rasa has demonstrated significant Anti-pyretic activity. This study has provided evidence base and given scope for clinical research.

KEYWORDS: Srirama Rasa, Jwara, Anti-pyretic activity,

INTRODUCTION

Ayurveda is one of the oldest system of medicine in India. The term Ayurveda is defined as the science of life. Ayurveda is considered as the Upaveda of Atharvaveda and Upanga of Rigveda[3], Brahma Vaivarta Purana considers Ayurveda as fifth Veda. According to Acharya Charaka, the knowledge of Ayu is derived from Ayurveda[2],

“Swastasya swaastyak rakshanam aaturasya vikara prashamanam”

Ayurveda is having its own specific motto and specialties. The primary aim of Ayurveda is preserving and promoting the health as well as preventing and curing the diseases.

In Ayurveda, Jwara is considered as ‘the king of all diseases’. Jwara is Pradhana vyadhi and Anubandhi vedhana in many of the diseases. According to Acharya Charaka, Prathyatma Lakshanas of Jwara is Santapa of Deha, Mana and Indriyas[3]. No other disease is so severe, so complicated and so difficult to treat as Jwara. That is why, Ayurveda gives much importance to Jwara and considered Jwara as Sarvarogaadhipati[4].

According to modern science, fever is a symptom of underlying disease. There are many causes for fever but infection is also considered as one of the cause. But according to Ayurveda, Mithya Ahara and Vihara (unwholesome food, physical activities and exposure) leads to aggravation of Vatadi Doshas which affects Amashaya and mixed up with the Agni. It follows the path of Rasa and obstructs the channels of Rasa and Sweda. It suppress the activity of Pachakagni and expels the heat out from the site of digestion and spreading it all over the body, and thus causing Jwara[5].

In modern science, Paracetamol, Diclofenac Sodium, NSAIDs and many other medicines have been used to treat fever and pain. But they are having various side effects like Dyspepsia, Haemorrhage in GIT, Nausea, Heart burn, Dizziness, Hepatic disorders, Rashes, etc[6].
Number of Jwarahara and Vedanahara drugs have been mentioned in our Ayurvedic classical texts, Srirama rasa is one such simple Kharaleeya rasayana formulation explained in the Jwara Chikitsa Prakaranam of Bhaishajya Ratnavali found to be more effective in the treatment of fever and pain. Srirama Rasa is a unique and potent Khaliy rasayana which is having ingredients Shuddha Parada, Shuddha Gandhaka, Maricha and Shuddha Jayapala beeja and Dantimoola kwatha as the Bhavana dravya.

- Shuddha Parada (1part)
- Shuddha Gandhaka (1part)
- Shuddha Jayapala beeja (3parts)
- Maricha Choorna (1part)
- Dantimoola Kwatha (Q.S.)

And, it is also indicated in several other diseases like Shoola, Vishtambha, and Vata vikaras etc.[7]. Rasashastra, known as the Indian Alchemy, a pharmaceutical branch of Indian system of medicine mainly deals with the metals, minerals etc. and their use in therapeutics.

Srirama Rasa, which comes under Kharaleeya Rasayana, in which the components of Srirama Rasa are expected to be Agni dipana, Ama pachana, Shrotoshodhaka, Malashuddhikara etc. These properties may contribute to relieve pyrexia. No anti-pyretic activity works has been carried out on Srirama Rasa and it is expected to be potent. In view to contribute a safe, effective and economical anti-pyretic formulation, the present study was planned.

### MATERIALS AND METHODS

The preparation of test drug i.e., Srirama Rasa done from Rasashala of Ramakrishna Ayurvedic Medical College, Yelahanka, Bangalore.

**Table 1: Ingredients and quantity used to prepare Srirama Rasa**

| Ingredients         | Quantity |
|---------------------|----------|
| Shuddha Parada      | 15 g     |
| Shuddha Gandhaka    | 15 g     |
| Shuddha Jayapala beeja | 45 g   |
| Maricha Choorna     | 15 g     |
| Dantimoola kwatha   | 100 ml   |

The drug which used as standard drug i.e. Paracetamol purchased from standard and reputed firms. Swiss albino rats of either sex weighing between 150-200 g were used for the study. Animals were produced from animal house. Eighteen Albino rats were selected and allotted to three groups of six rats in each group. Six rats were housed in each cage made up of poly-propylene with stainless top grill. The husk was used as bedding material and was changed frequently to protect from infections. Animals were maintained at standard laboratory conditions such as temperature at 23-24\(^{\circ}\) C, humidity of 48-63% and 12 hr light and dark cycles. Animals were fed with standard pellet feed supplied by VRK nutrition solution and aqua guard water in polypropylene bottles. The Animal Ethical committee has approved for experimentation on Animals with reference no – (Approval number-Invivo-090).

**Table 2: showing Grouping and Dose fixation in Anti-pyretic study**

| Sl.No. | Group          | No. of Animals | Treatment  | Dose       |
|--------|----------------|----------------|------------|------------|
| 1.     | Disease control| 6              | Yeast      | 10ml/Kg    |
| 2.     | Standard       | 6              | Paracetamol| 50mg/Kg    |
| 3.     | Trial Drug     | 6              | Srirama Rasa| 4.5mg/200g |

Total 18 Albino rats of either sex weighing between 150 g to 200 g had been taken and divided randomly into three groups, each containing six rats. All healthy Albino rats which was selected for the experiments and kept under fasting for 18 hours, before the commencement of the experiment. Initial normal rectal temperature of all the rats was recorded by using a digital thermometer. Fever was induced by using 20% of Brewer’s yeast solution which was injected subcutaneously in Albino rats in the dose of 10ml/kg body weight and was placed in the cages kept for them. Then the rectal temperature of the each rat had been noted 18\(^{th}\) hour after the injection of Brewer’s yeast. After 18th hour of injection of yeast corresponding test drug was administrated to respective group. Rats of group first which was administered with distilled water served as Control. Rats of group 2nd had been administered with paracetamol suspension at the dose of 50mg/kg body wt. by using the feeding syringe to serve as reference Standard. Similarly, rats of group third had been administered with the Srirama Rasa (trial drug) dose of OECD 425 guidelines. After administering corresponding drug to each group, hourly rectal temperature of each rat was noted for 6 hours and after 24 hours.

**OBSERVATION & RESULTS**

After the induction of Baker’s yeast solution, all the albino rats were closely observed for their behaviour and symptoms. The observations noted are mentioned below:
1. Increase in temperature was noted in all the rats.
2. Trembling was noted in most of the rats after one hour of the induction of Baker’s yeast.
3. Fur erected.
4. Face of the rats bent downwards
5. They were less active

All these symptoms found in rats confirmed that they were suffering from hyper pyrexia.

After 18hrs of inducing fever to rats, the respective drugs had given to the rats. After administering corresponding drug to each group, hourly rectal temperature has been noted for 6hrs and after 24hrs and the data is reported.

Observation at Zero hour
Here, the rectal temperature was recorded and observed at Zero hour.

Table 3: Mean values of Rectal Temperature at 0-hr

| Group       | Mean Rectal Temperature (in °C) | SEM |
|-------------|---------------------------------|-----|
| Disease control | 33.22                           | 0.33 |
| Positive control | 33.40                           | 0.34 |
| Srirama Rasa     | 33.50                           | 0.35 |

Observation at One hour
Here, the rectal temperature was recorded and observed at One hour.

Table 4: Mean values of Rectal Temperature at One hour

| Group       | Mean Rectal Temperature (in °C) | SEM |
|-------------|---------------------------------|-----|
| Disease control | 36.54                           | 0.19 |
| Positive control | 34.98                           | 0.51 |
| Srirama Rasa     | 36.44                           | 0.64 |

Observation of Second hour
Here, the rectal temperature was recorded and observed at Second hour.

Table 5: Mean values of Rectal Temperature at second hour

| Group       | Mean Rectal Temperature (in °C) | SEM |
|-------------|---------------------------------|-----|
| Disease control | 36.72                           | 0.29 |
| Positive control | 34.23                           | 0.48 |
| Srirama Rasa     | 36.33                           | 0.60 |

Observation at Third hour:
Here, the rectal temperature was recorded and observed at Third hour.

Table 6: Mean values of Rectal Temperature at third hour

| Group       | Mean Rectal Temperature (in °C) | SEM |
|-------------|---------------------------------|-----|
| Disease control | 36.53                           | 0.20 |
| Positive control | 33.47                           | 0.27 |
| Srirama Rasa     | 35.88                           | 0.64 |

Observation at Fourth hour
Here, the rectal temperature was recorded and observed at Fourth hour.

Table 7: Mean values of Rectal Temperature at Fourth hour

| Group       | Mean Rectal Temperature (in °C) | SEM |
|-------------|---------------------------------|-----|
| Disease control | 36.10                           | 0.27 |
| Positive control | 33.33                           | 0.27 |
| Srirama Rasa     | 35.68                           | 0.62 |

Observation at Fifth hour
Here, the rectal temperature was recorded and observed at Fifth hour.
Table 8: Mean values of Rectal Temperature at Fifth hour

| Group          | Mean Rectal Temperature (in °C) | SEM |
|----------------|---------------------------------|-----|
| Disease control| 35.88                           | 0.26|
| Positive control| 33.30                          | 0.27|
| Srirama Rasa    | 33.50                           | 0.27|

Observation at Sixth hour
Here, the rectal temperature was recorded and observed at Sixth hour.

Table 9: Mean values of Rectal Temperature at Sixth hour

| Group          | Mean Rectal Temperature (in °C) | SEM |
|----------------|---------------------------------|-----|
| Disease control| 35.30                           | 0.25|
| Positive control| 33.25                          | 0.27|
| Srirama Rasa    | 33.18                           | 0.30|

Observation after 24 hour
Here, the rectal temperature was recorded and observed after 24 hour.

Table 10: Mean values of Rectal Temperature after 24 hrs

| Group          | Mean Rectal Temperature (in °C) | SEM |
|----------------|---------------------------------|-----|
| Disease control| 33.13                           | 0.36|
| Positive control| 32.97                          | 0.23|
| Srirama Rasa    | 32.85                           | 0.28|

In test drug group gradual increase in temperature was noted from 1st hour to till 3rd hour and then gradual reduction in temperature was noted from 4th hour to 6th hour and 24hr. Significant antipyretic activity was observed from 5th, 6th hour and till 24 hr of drug administration.

In standard drug group gradual reduction in temperature was noted from 3rd hour to 6th hour and 24hr. Significant antipyretic activity was observed from 3rd hour to 6th hour and 24hr of drug administration.

Srirama Rasa produced very good antipyretic activity, the observed activity was almost similar to that in paracetamol treated group.

DISCUSSION
Srirama Rasa is a Khalvi rasayana with a unique Herbo-mineral combination of drugs to treat Jwara. It was found in the Bhaishajya Ratnavali Jwara Chikitsa Prakaranam.

Its ingredients include, Shuddha Parada (1 part), Shuddha Gandhaka (1 part), Shuddha Jayapala beaja (3 parts), Maricha Choorna (1 part) and Dantimoola Kwatha (Quantity Sufficient). With the classical preparation and the properties of the drugs which are present, it shows the Jwarahara property. As Srirama Rasa is currently indicated and useful in the Jwara, Shoola etc. Vikaras, the attempt is done for its Anti-pyretic activity.

Antipyretic activity was carried out in rats by yeast induced hyperpyrexia method. In test drug group gradual increase in temperature was noted from 1st hour to till 3rd hour and then gradual reduction in temperature was noted from 4th hour to 6th hour and 24hr. Significant antipyretic activity was observed from 5th, 6th hour and till 24 hr of drug administration. In standard drug group gradual reduction in temperature was noted from 3rd hour to 6th hour and 24hr. Significant antipyretic activity was observed from 3rd hour to 6th hour and 24hr of drug administration. Srirama Rasa produced very good antipyretic activity, the observed activity was almost similar to that in Paracetamol treated group.

CONCLUSION
The present study entitled “Anti-Pyretic activity of Srirama Rasa in albino rats” has put forth the following concluding statement.

- The formulation Srirama Rasa has therapeutic properties Jwaraghna was studied with respect to Anti-pyretic.
- Jwara is one of the basic pathology in almost all diseases. So Jwaraghna properties of the drug have multi systemic actions.
- The Anti-pyretic activity of Srirama Rasa was compared with standard drug Paracetamol and Analgesic activity was compared with standard drug Diclofenac Sodium.
- The Anti-pyretic activity of Srirama Rasa showed significant Anti-pyretic action when compared to the control group and showed slightly less significant action when compared to the standard drug Paracetamol.
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Images

Fig. no 1: Shuddha Parada
Fig. no 2: Shuddha Gandhaka
Fig. no 3: Shuddha Jayapala beeja

Fig. no 4: Maricha Choorna
Fig. no 5: Kajjali preparation
Fig. no 6: Kajjli

Fig. no 7: Dantimoola kwatha preparation
Fig. no 8: Srirama Rasa preparation
Fig. no 9: Srirama Rasa

Fig. no 10: Animal Grouping
Fig. no 11: Animal Dosing