Clinical Research

A comparative study of efficacy of Tugaksheeree [Curcuma angustifolia Roxb. and Maranta arundinacea Linn.] in management of Amlapitta

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Abstract

Amlapitta is a disease caused by increase of Amla Guna of Pitta. Starch obtained from the rhizomes of two plants viz., Curcuma angustifolia Roxb. (Fam. Zingiberaceae) and Maranta arundinacea Linn. (Fam. Marantaceae) are used as Tugaksheere. In the present clinical study, the efficacy of Tugaksheeree was studied on 67 patients of Amlapitta. A total of 84 patients suffering from Amlapitta were selected from the O.P.D. and I.P.D. sections in the department of Dravyaguna, I.P.G.T. and R.A., Hospital, Jamnagar, and were randomly divided into two groups. Thirty four patients completed the treatment course in Group I, and 33 patients completed the treatment course in Group II. The efficacy of drug Tugaksheere was studied through internal administration of the starches of C. angustifolia Roxb. (Fam. Zingiberaceae) in Group I and M. arundinacea Linn. (Fam. Marantaceae) in Group II with the dose of 4 g TID with water for 30 days. Both the drugs were found highly effective in treating Amlapitta. They significantly relieved the cardinal symptoms viz., Avipaka, Tikta-amlodgara, Daha, Shoola, Chhardi and the associated symptoms viz., Aruchi, Gaurava, Udaradhmana, Antrakujana, Vit bheda, Shiroruja, Angasada, and Trit. Statistically significant increase in body weight was noticed in both the groups. This may be because the drugs corrected the Agni and acted as Brihmana and Dhatupushthikara. Both the drugs did not produce any side effects. Therefore, both these drugs (C. angustifolia Roxb. and M. arundinacea Linn.) can be used as substitutes for each other.

Key words: Tugaksheere, Curcuma angustifolia Roxb. and Maranta arundinacea Linn. Starch, Amlapitta

Introduction

Impairment of Agni leads to the impairment of digestion and metabolism, leading to the diseases. Amlapitta is one of such diseases caused by the impairment of Agni. When Pitta attains Amla guna excessively, the disease Amlapitta is produced.

There is a mention of Amlapitta since the Samhita period. In Charaka Samhita, Kalattha, Lavana rasa, Viruddha ahara etc. are told as the causative factors for Amlapitta. While describing Grahani Chikitsa, Acharya Charaka described the pathogenesis of Amlapitta.¹ Sushruta Samhita describes condition of Amlika similar to Amlapitta because of excessive intake of Lavana rasa.² Kashyapa Samhita is the first available text which explained Amlapitta as separate entity.³ In Harita Samhita, Amlapitta and Amla Hikka are explained with treatment.⁴ Madhava Nidana described two types of Amlapitta namely, Urdhwa and Adhoga.⁵ Chakra dutta,⁶ Bhavaprakasha,⁷ Yogaratnakara,⁸ etc. also described this disease with treatment.

Amlapitta is a commonly occurring psychosomatic disease and can be correlated with diseases like gastritis, hyperacidity, non-ulcer dyspepsia etc.

Tugaksheeree has been mentioned as an ingredient in many ayurvedic formulations for the treatment of Amlapitta and other diseases viz., Eladi Churna, Narihela Khanda Paka, (Yogaratnakara),⁹ Pippalyadyavaleha (Vanga Sena Samhita),¹⁰ Chyavana Prasha, Vajikarana Ghrita, Sitopaladi Churna (Charaka Samhita),¹¹ Bala Ghrita (Sushruta Samhita),¹² Dadimashthaka Churna, Drakshavaleha (Astanga Hridaya),¹³ Lavangadi Churna (Sharanagadhar Samhita)² etc.

Starch obtained from the rhizomes of the following two plants are used as Tugaksheeree:

1. Curcuma angustifolia Roxb. (Fam. Zingiberaceae) [East Indian Arrowroot].

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2. *Maranta arundinacea* Linn. (Fam. *Marantaceae*) [West Indian Arrowroot].

(Sharma P. V., Bapalal G. Vaidya).\(^{[1,13]}\)

These two are used as folklore medicine for treating Amlapitta and also as a nutritional food supplement in Dakshina Kannada district of Karnataka.

Even though considerable research work was carried out on *Amlapitta* using single drugs as well as formulations, till date, no study has been carried out on the above two plant species regarding their efficacy in treating *Amlapitta*. Hence it was taken up for the present study.

**Aims and Objectives**

To assess the efficacy of *Tugaksheeree* [*C. angustifolia* Roxb. (Fam. *Zingiberaceae*)] and *M. arundinacea* Linn. (Fam. *Marantaceae*) in *Amlapitta*.

To ascertain if administration of *Tugaksheeree* was associated with any side effects or not.

To find out a cheap, safe, and effective remedy.

**Materials and Methods**

**Criteria for selection of patients**

- Patients between the age group of 15 and 60 years suffering from *Amlapitta* were selected and subjected to thorough clinical history and physical examination irrespective of age, sex, religion, occupation etc. from the O.P.D. and I.P.D. sections of Institute for Post Graduate Teaching and Research in Ayurveda, Hospital, Jamnagar and then randomly divided into two groups.

- Diagnosis was made according to the scientific research proforma, which was prepared as per the signs and symptoms of *Amlapitta* as mentioned in the Ayurvedic texts and modern methods of examination. Patients fulfilling the criteria of proforma were selected for the study.

- Routine laboratory investigations of blood, urine, and stool were conducted to assess the general health condition of patients, both before and after the treatment in the pathology laboratory of I.P.G.T. and R.A. Hospital, Jamnagar.

- Body weight of all the patients was recorded both before, mid-term (i.e. after 15 days) and after the treatment.

- All the maneuvers described above were conducted before and after the treatment.

**Criteria for exclusion of patients**

1. Patients of age below 15 years and above 60 years.
2. Patients having other diseases like ulcers in stomach/duodenum, carcinoma etc.

**Treatment**

Trial drug: *Tugaksheeree*.

**Botanical name**

1. *Curcuma. angustifolia* Roxb. (Fam. *Zingiberaceae*) (Rhizome starch).

2. *Maranta arundinacea* Linn. (Fam. *Marantaceae*) (Rhizome starch).

Route of administration: Oral.

Dose: 4 g thrice daily.

Anupana: Water.

Duration: 30 days.

Follow-up: 30 days.

**Grouping**

**Group I:** *Curcuma angustifolia* Roxb. (Fam. *Zingiberaceae*)

**Group II:** *Maranta arundinacea* Linn. (Fam. *Marantaceae*)

**Regimen**

Patients were advised to follow Madhura, Tikta, Kashaya rasayukta and Sheeta veeryayukta, simple regular diet and bowel habits; to take sufficient quantity of water, to avoid *Katu, Amla, Lavana rasas* in excess, oily, fried and spicy food, mental stress and keeping awake till late night.

**Assessment criteria**

Assessment of the effect of treatment was done on the basis of the relief in the clinical signs and symptoms of the disease and improvement in routine hematological and pathological investigations.

Most of the signs and symptoms of the disease *Amlapitta* described in Ayurvedic classics are subjective in nature. Hence, in order to provide some objectivity to the subjective results and to make easy the statistical analysis, multidimensional scoring system was adopted for the patients. This symptoms score was calculated before and after the treatment through statistical analysis, and percentage of relief was noted to assess the efficacy of therapy.

**Scoring pattern**

Scoring pattern was adopted to assess the relief in the cardinal and associated complaints as follows:

**Chief complaints**

- **Avipaka:** Jirna ahara lakshana – Utsaha, Laghuta, Udgara, Shuddhi, Shuddha Trisha Pravritti, and Yathochna Malotsarga

  0: Presence of all the five symptoms 6 h after taking food.

  1: Presence of four symptoms 6 h after taking food.

  2: Presence of three symptoms 6 h after taking food.

  3: Presence of two symptoms 6 h after taking food.

  4: Presence of one symptom 6 h after taking food.

  5: Presence of all symptoms 6 h after taking food.

- **Tikta-amlodgara**

  0: No *Tikta-amlodgara*

  1: *Tikta-amlodgara* sometimes during the day, which subsides in an hour.

  2: *Tikta-amlodgara* of moderate degree up to next meals but does not disturb the patient.

  3: Severe *Tikta-amlodgara* for whole day disturbing the patient.

  4: Severe continuous *Tikta-amlodgara* and small amount of fluid regurgitate in patient’s mouth.

- **Hrit Kantha Daha**

  0: No *Daha*

  1: Mild degree of Daha in Hrit Kantha.

  2: Moderate degree of Daha that subsides after taking sweets/cold food/milk/antacids.
3: Severe degree of Daha involving two or three regions like Kantha/Hrit/Udara etc. and relieved after vomiting or by antacids to some degree only.
4: Severe degree of Daha which is not relieved by any means.

Shoola
0: No pain.
1: Mild pain which needs no medicine.
2: Moderate degree of pain that subsides after taking some sweets/cold drinks/milk/antacids etc.
3: Severe unbearable pain, which is relieved after vomiting.
4: Severe unbearable pain, which does not subside by any treatment.

Chhardi
0: No vomiting at all.
1: Feels sense of nausea daily, but occasional episodes of vomiting with frequency not more than two times per month.
2: Frequency of vomiting 1 to 2 times per week.
3: Frequency of vomiting 1 to 2 times per day.
4: Frequency of vomiting 3 to 4 times every day after taking food or even without taking any food.

Associated complaints
For all the other associated symptoms, the scoring pattern is given as follows:
02: Symptoms observed before treatment.
01: Some relief after treatment.
00: Complete relief after treatment.
02: No improvement after treatment.

Assessment of total effect of the therapies
Complete remission (cured): 100% relief in signs and symptoms of Amlapitta.
Marked improvement: 75–100% relief in signs and symptoms of Amlapitta.
Moderate improvement: 50–75% relief in signs and symptoms of Amlapitta.
Mild improvement: 25–50% relief in signs and symptoms of Amlapitta.
No improvement (unchanged): Below 25% relief in signs and symptoms of Amlapitta.

Statistical assessment
The effect of the treatment on signs and symptoms were analyzed statistically; mean, SD, SE and ‘t’ values are calculated as per paired t-test and χ² to compare between the two groups.
- Highly significant: P < 0.001
- Significant: P < 0.01
- Insignificant: P > 0.05

Observations and Results
Cardinal signs and symptoms
In the present study, Avipaka, Tikta-amlodgara, Daha, and Shoola were found in all i.e., 100% of the patients and Chhardi was observed in 20.24% of the patients.

Associated signs and symptoms
In the present study, Gaurava was observed in all the patients (100%), followed by Udaradhmana in 98.81% of the patients, Aruchi in 96.43% of the patients, Antrakujana in 95.24% of them, Angasada in 92.86%, Shiroruja in 85.71%, and Trit in 73.81%, and Vit bheda was complained by 19.05% of the patients.

Effect on cardinal signs and symptoms in Group I (C. angustifolia)
Table 1 shows the effect of therapy in group I. The effect was statistically significant in all the symptoms.

Effect on cardinal signs and symptoms in Group II (M. arundinacea)
The effect of therapy in group II is presented in Table 2. The effect was statistically significant in all the symptoms except Chhardi.

Effect on associated signs and symptoms in Group I (C. angustifolia)
In Group I treated with C. angustifolia Roxb., the relief in Aruchi was 79.40% which was statistically highly significant. The relief in Gaurava was 61.75% which was statistically highly

### Table 1: Effect on cardinal signs and symptoms in Group I (C. angustifolia)

| Symptoms     | n  | Mean B.T. | Mean A.T. | Percentage % | Mean  | S.D.  | S.E.  | 't'     | P      |
|--------------|----|-----------|-----------|--------------|-------|-------|-------|---------|--------|
| Avipaka      | 34 | 3.176     | 0.618     | 80.54        | 2.588 | 0.783 | 0.134 | 19.313  | <0.001 |
| Tikta-amlodgara | 34 | 2.880     | 0.118     | 95.90        | 2.823 | 0.387 | 0.066 | 42.520  | <0.001 |
| Daha         | 34 | 3.147     | 0.441     | 85.99        | 2.710 | 0.760 | 0.130 | 20.844  | <0.001 |
| Shoola       | 34 | 2.559     | 0.059     | 97.69        | 2.500 | 0.663 | 0.114 | 21.930  | <0.001 |
| Chhardi      | 09 | 1.444     | 0.000     | 100.00       | 1.222 | 0.441 | 0.147 | 8.313   | <0.001 |

### Table 2: Effect on cardinal signs and symptoms in Group II (M. arundinacea)

| Symptoms     | n  | Mean B.T. | Mean A.T. | Percentage % | Mean  | S.D.  | S.E.  | 't'     | P      |
|--------------|----|-----------|-----------|--------------|-------|-------|-------|---------|--------|
| Avipaka      | 33 | 2.820     | 0.697     | 75.28        | 2.121 | 0.650 | 0.113 | 18.77   | <0.001 |
| Tikta-amlodgara | 33 | 2.790     | 0.121     | 95.66        | 2.667 | 0.479 | 0.083 | 32.132  | <0.001 |
| Daha         | 33 | 2.450     | 0.636     | 74.04        | 2.303 | 0.684 | 0.119 | 19.353  | <0.001 |
| Shoola       | 33 | 2.120     | 0.090     | 95.75        | 2.000 | 0.867 | 0.151 | 13.245  | <0.001 |
| Chhardi      | 05 | 0.151     | 0.000     | 100.00       | 1.000 | -     | -     | -       | -      |

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significant. The relief in *Udaradhmana* was 92.65% which was statistically highly significant. The relief in *Antrakujana* was 98.50% which was statistically highly significant. The relief in *Vit bheda* was 95% which was statistically highly significant. The relief in *Shiroruja* (95%) was statistically highly significant. The relief in *Angasada* (77.25%) was statistically highly significant. *Trit* was relieved by 94%, was statistically highly significant.

**Effect on Associated Signs and Symptoms in Group II (M. arundinacea)**

In Group II treated with *M. arundinacea* Linn., the relief in *Aruchi* was 73.45% which was statistically highly significant. *Gaurava* was relieved by 51.50%, which was statistically highly significant. *Udaradhmana* was relieved by 74.25%, which was statistically highly significant. The relief in *Antrakujana* was 96.65% which was statistically highly significant. The relief in *Vit bheda* was 100% even though statistically non-significant. The relief *Shiroruja* (96.15%) was statistically highly significant. The relief in *Angasada* (76.86%) was statistically highly significant. *Trit* was relieved by 86.35%, which was statistically highly significant.

**Effect on body weight (0−15 days) in Group I (C. angustifolia):**

In Group I treated with *C. angustifolia* Roxb., the BT mean score of body weight was 65.70 which was increased to 63.87 after 15 days of treatment. The increase in body weight was 0.267% which was statistically significant.

**Effect on body weight (0−15 days) in Group II (M. arundinacea):**

In Group II treated with *M. arundinacea* Linn., the BT mean score of body weight was 65.76 which was increased to 63.92 after 15 days of treatment. The increase in body weight was 0.251% which was statistically significant.

**Effect on body weight (15−30 days) in Group I (C. angustifolia):**

In Group I treated with *C. angustifolia* Roxb., the BT mean score of body weight was 65.51 which was increased to 65.70 in 15−30 days of treatment. The increase in body weight was 0.299% which was statistically significant.

**Effect on body weight (15−30 days) in Group II (M. arundinacea):**

In Group II treated with *M. arundinacea* Linn., the BT mean score of body weight was 64.51 which was increased to 64.89 in 15−30 days of treatment. The increase in body weight was 0.589% which was statistically highly significant.

**Effect on body weight (0−30 days) in Group I (C. angustifolia):**

In Group I treated with *C. angustifolia* Roxb., the BT mean score of body weight was 65.32 which was increased to 65.70 after 30 days of treatment. The increase in body weight was 0.600% which was statistically highly significant.

**Effect on body weight (0−30 days) in Group II (M. arundinacea):**

In Group II treated with *M. arundinacea* Linn., the BT mean score of body weight was 64.33 which was increased to 64.89 after 30 days of treatment. The increase in body weight was 0.871% which was statistically highly significant.

**Comparison between Group I (C. angustifolia) and Group II (M. arundinacea):**

Between the two, *C. angustifolia* Roxb. was found more effective on the symptoms *Gaurava* (61.75%) and *Udaradhmana* (92.65%) against *M. arundinacea* Linn. (51.50%) and (74.25%), respectively.

**Discussion**

In the present study, cardinal signs and symptoms such as *Avispaka, Tikta-amlodgara, Daha*, and *Shoola* were found in all i.e., 100% of the patients and *Chhardi* was observed in 20.24% of the patients. This may be due to *Katu, Lavana*, and *Annya rasa Pradhananata* in routine diet and other faulty dietary habits. Due to variation in the diet, mental condition, metabolism, sleeping pattern, addiction etc., the degree of severity was different in each and every patients.

In an associated signs and symptoms, *Gaurava* was observed in all the patients (100%), followed by *Udaradhmana* in 98.81% of the patients, *Aruchi* in 96.45% of the patients, *Antrakujana* in 95.24% of them, *Angasada* in 92.86%, *Shiroruja* in 85.71% and *Trit* in 73.81% and *Vit bheda* was complained by 19.05% of the patients. It may be due to improper dietary habits which lead to vitiation of *Pitta* and impairment of *Agni*.

It was observed that both the drugs are highly effective in treating *Amlapitta*. They were highly effective in relieving the cardinal symptoms viz. *Avispaka, Tikta-amlodgara, Daha, Shoola*, and *Chhardi* [Tables 1 and 2] and also effective against the associated symptoms viz. *Aruchi, Gaurava, Udaradhmana, Antrakujana, Vit bheda, Shiroruja, Angasada*, and *Trit*.

(P < 0.001).

Between the two, *C. angustifolia* Roxb. was found more effective on the symptoms *Gaurava* (61.75%) and *Udaradhmana* (92.65%) against *M. arundinacea* Linn. (51.50%) and (74.25%) respectively.

Significant increase in body weight was noticed in both the groups. This may be because the drugs corrected the *Agni* and acted as *Brihihna* and *Dhatu Pushtikara* [Tables 3 and 4].

The difference between the effect of the therapy on cardinal and associated symptoms of *Amlapitta* is statistically non-significant, and hence both the drugs *C. angustifolia* Roxb. and *M. arundinacea* Linn. are equally potent in treating the disease.

Complete remission in Group I (*C. angustifolia*) was 08.82% while in Group II (*M. arundinacea*) was 03.03%, marked improvement in Group I (*C. angustifolia*) was 85.29% while in Group II (*M. arundinacea*) was 78.79%, moderate improvement in Group I was 5.88% and in Group II was 18.18%, mild improvement in Group I and in Group II was 0%, and the effect of the therapy unchanged in none of the patients [Table 5].

**Probable mode of drug action**

The basic principles of Ayurvedic Pharmacology of Ayurveda is based on the theory of *Rasa, Guna, Veerya, Vipaka*, and *Prabhava*, which were the simplest parameters in those days to ascertain the action of drug.

Acharya Charaka states that certain drugs act through *Rasa*, some through *Veerya*, some through their *Gunas*, some through their *Vipaka*, and some through their *Prabhava* (Chara.Su.26/71).{[1]}

The drug *Tugaksheere* possesses *Madhura Rasa*, *Shita* *Virya*, *Laghu*, *Snigdha* *Gunas*, and *Madhura Vipaka*.

Because of its *Madhura Rasa* and *Madhura Vipaka*, *Tugaksheere*
acts as Vata and Pittamayaka. Shita Virya acts as Pittamayaka and reduces the excessive acidic gastric secretions. Snigdha Guna acts as Vatahama. Therefore, it also acts as Brihmana, Paushtika, Dhatuvriddhikara and Raktashuddhikara. Laghu Guna stimulates Agni and helps in the process of digestion, remove Srotorodha, does Ropana Karma, and help to bring down the vitiated Rasa Dhatu to normalcy.

Thus Tugaksheere acts on Amlapitta to minimize the process of pathogenesis and helps to maintain the normalcy of the Dhatus.

### Conclusion

Both the drugs C. angustifolia Roxb. and M. arundinacea Linn. are highly effective in treating Amlapitta. They are highly effective in relieving the cardinal symptoms viz., Avipaka, Tikta-amlodgara, Daha, Shoola, and Chardi and also effective against the associated symptoms viz., Aruchi, Gaurava, Udaradhanma, Antrakujana, Vithbhed, Shiroraja, Angasada, and Irir. The drugs have the capacity to correct the Agni and act as Brihmana and Dhatupushtikara as observed by increase in body weight. Both the drugs C. angustifolia Roxb. and M. arundinacea Linn. are free from side effects and can be used as substitutes for each other.

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