



Clinical Research

A comparative clinical study of *Jethimala* (*Taverniera nummularia* Baker.) and *Yashtimadhu* (*Glycyrrhiza glabra* Linn.) in the management of *Amlapitta*

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Abstract

Introduction: *Amlapitta* is very common disease in society. In present era hectic lifestyle, irregular and faulty dietary habits, etc. are the causative factors of *Amlapitta*. Most of the symptoms of hyper acidity are enumerated in the conditions of *Amlapitta* delineated in Ayurvedic classics. The local people and *Vaidyas* of *Saurashtra* and *Kutchh* region have been frequently using *Jethimala* as *Yashtimadhu*, botanically known as *Taverniera nummularia* Baker. **Aim:** To evaluate and compare the clinical efficacy of *Jethimala* (*T. nummularia*) and *Yashtimadhu* (*Glycyrrhiza glabra* Linn.) in *Amlapitta*. **Materials and Methods:** In this present clinical study, total 40 patients of *Amlapitta* were registered and randomly divided into two groups. In group A, *Yashtimadhu Moola Choorna* (*G. glabra* root powder) and in group B *Jethimala Moola Choorna* (*T. nummularia* root powder) was given for 2 weeks with water. A clinical research proforma was specially designed on the basis of classically reported signs and symptoms of *Amlapitta* for assessing the efficacy of the study drugs. **Results:** *Yashtimadhu* and *Jethimala* significantly relieved the cardinal symptoms of *Amlapitta* like, *Tikta-Amlodgara* (eructations with bitter or sour taste) 67.64% in group A and 60% in group B, *Hrit-Kanthadaha* (burning sensation in the chest and throat) 69% in group A and 66.06% in group B and *Utklesha* (nausea) 65.35% in group A and 61.70% in group B. **Conclusion:** Statistically significant improvement was observed in all the symptoms in both the groups. While in comparison *Jethimala* showed better effect than *Yashtimadhu* (*G. glabra*) in *Aruchi*. It is concluded that *Jethimala* can be used as a substitute for *Yashtimadhu*.

Key words: *Amlapitta*, *Glycyrrhiza glabra*, hyper acidity, *jethimala*, *taverniera cuneifolia*, *Taverniera nummularia*, *yashtimadhu*

Introduction

Amlapitta is very common disease caused due to *Agnimandhya* (digestive impairment) by increased *Drava Guna* of *Vidagdha Pachaka Pitta* (liquid quality of burned digestive *Pitta*) affecting the *Annavaaha Strotas* (channels that carry the ingested food) and characterized by primary symptoms such as *Avipaka* (indigestion), *Klama* (exhaustion without any exertion).^[1] This is a burning problem in the society because of irregular and improper food habits and stressful lifestyle.

In *Charakasamhita*, *Acharya Charaka* has not mentioned *Amlapitta* as a separate disease, but many scattered

references regarding *Amlapitta* are available. While describing *Grahani Chikitsa*, *Acharya Charaka* described the pathogenesis of *Amlapitta*.^[2] *Sushruta* while describing the diseases caused by excessive use of *Lavana* (salt); mentioned a disease "*Amlika*" which is similar to *Amlapitta*.^[3] *Kashyapasamhita* is the first available text which explained *Amlapitta* as separate entity.^[4] *Madhava Nidana* described two types of *Amlapitta* namely, *Urdhvaga* (upward) and

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How to cite this article: Prajapati SM, Patel BR. A comparative clinical study of *Jethimala* (*Taverniera nummularia* Baker.) and *Yashtimadhu* (*Glycyrrhiza glabra* Linn.) in the management of *Amlapitta*. *Ayu* 2015;36:157-62.

Adhoga (downward).^[5] *Chakradutta*,^[6] *Bhavaprakasha*,^[7] *Yogaratanakara*,^[8] etc., also described this disease with treatment. The line of treatment consists of mainly *Shodhanakarma* (purification). However, in the present day lifestyle, patients cannot provide enough time to carry forward this type of treatment and so we have to choose the most appropriate and effective *Shamana* (pacifying) therapy. According to *Bhavaprakasha*, *Yashtimadhu* is *Pittashamaka* drug (pacifying *Pitta*).^[9] Due to its *Dahashamaka* (pacifying burning sensation) and *Pittashamaka* properties, it can be used effectively in management of *Amlapitta*. The roots of *Taverniera nummularia* locally known as *Jethimala* are sweet in taste and used as a substitute for the licorice (*Glycyrrhiza glabra* Linn) by the tribes of Gujarat.^[10] *T. nummularia* as a single drug is not evaluated for their effect on the management of *Amlapitta*. In the present clinical research, an attempt has been made to assess and compare the effect of *Jethimala* (*T. nummularia*) and *Yashtimadhu* (*G. glabra*) in the management of *Amlapitta*.

Materials and Methods

In the present study, 40 patients having signs and symptoms of *Amlapitta* were registered from the OPD of Dravyaguna Department, IPGT and RA Hospital, Gujarat Ayurved University, Jamnagar. The research protocol was approved by Institutional Ethics Committee (No. PGT/7-A/Ethics/2012-13/1964; dt. 21/09/2012) and registered in Clinical Trials Registry of India (CTRI/2013/03/003510; dt.: 25/03/2013). An informed consent from each enrolled patient was obtained before commencement of the treatment.

Inclusion criteria

- Patients of 21–60 years age
- Presence of *Pratyatmaka Lakshanas* (cardinal symptoms) of *Amlapitta* such as *Avipaka* (indigestion), *Klama* (exhaustion without any exertion), *Utklesha* (nausea), *Tikta-Amlodgara* (erectations with bitter or sour taste), *Gaurava* (feeling of heaviness of the body), *Hrit-Kanthadaha* (burning sensation in the chest and throat), and *Aruchi* (loss of appetite)
- Chronicity <1 year
- Patients with gastritis, gastric erosion.

Exclusion criteria

- Chronicity >1 year
- Patients having any systemic disorders such as hypertension, diabetes
- Patient with gastrointestinal complications such as peptic ulcer, duodenal ulcer, perforation, stenosis, bleeding, malaena, and malignancy.

Grouping and posology

All the registered 40 patients were divided into two groups ($n = 20$ each) randomly by coin tossing method. In group A, 2 g of *Yashtimadhu Choorna* (root powder of *G. glabra*) and in group B, 2 g of *Jethimala Choorna* (root powder of *T. nummularia*) was administered thrice a day for 2 weeks with water.

Investigations

Investigations such as routine blood examination and urine examination were conducted to assess the general health condition of patients.

Criteria for assessment

Assessment was done on the basis of improvement in signs and symptoms of the *Amlapitta* on the basis of specific scoring pattern.

Scoring adopted for different parameters was as follows:

1. *Amlodgara* (erectations with bitter or sour taste)

No <i>Amlodgara</i> at all	0
Occasionally during day or night for less than half hour after meals	1
<i>Amlodgara</i> after every intake of meal any food substance for half to 1 h, and relieved by digestion of food or vomiting	2
<i>Amlodgara</i> disturbing the patient, even small amount of fluid regurgitates to patient's mouth	3
2. *Aruchi* (loss of appetite)

Willing toward all <i>Bhojya Padartha</i> (dietary elements)	0
Unwilling toward some specific <i>Rasa</i> that is <i>Katu/Amla/Madhura Ahara</i> (bitter, sour, and sweet taste)	1
Unwilling toward liking foods but could take meal	2
Totally unwilling for meal	3
3. *Avipaka* (indigestion)

No <i>Avipaka</i>	0
<i>Avipaka</i> occurs daily after each meal takes 4–6 h for <i>Udgara Shuddhi Lakshanas</i>	1
Daily after each meals/seldom feels hunger but eats the foods only once in a day and does not have hunger by evening	2
Never gets hungry always heaviness in abdomen followed by <i>Gaurava, Alasya, etc. Lakshanas</i>	3
4. *Gaurava* (feeling of heaviness of the body)

Not at all	0
Occasionally feeling of heaviness	1
Heaviness remains up to the <i>Jaranakala</i> (4–6 h) only	2
Heaviness also followed by <i>Jaranakala</i> for >2 h	3
5. *Daha* (burning sensation in the chest and throat)

No <i>Daha</i> at all	0
<i>Daha</i> of mild degree	1
<i>Daha</i> of moderate degree	2
<i>Daha</i> of severe degree	3
6. *Klama* (exhaustion without any exertion)

No <i>Klama</i>	0
Lassitude without <i>Shrama</i> daily for sometimes	1
Lassitude without <i>Shrama</i> daily for long	

duration	2
Always feels tired and have no enthusiasms	3
7. <i>Utklesha</i> (nausea)	
No <i>Utklesha</i> at all	0
Occasionally but not daily	1
Daily and after taking meal (1–2 h)	2
Frequently and feels <i>Amlasyata</i> and <i>Amlagandha</i>	3

Assessment of overall effect of therapy

The total effect of therapy was assessed considering overall improvement in sign and symptoms.

- Complete remission: 100%
- Marked improvement: 76–99%
- Improvement: 51–75%
- Mild improvement: 26–50%
- Unchanged: Below 25%.

Statistical analysis

The Paired *t*-test was used to assess the effect of therapy in each group and unpaired *t*-test was applied to compare the effect of therapies in both groups. Statistical calculations were made with the help of Sigmastat 3.5 software (SYSTAT Software, USA). The results were interpreted as; insignificant $P > 0.05$, significant $P < 0.05$, significant $P < 0.01$, highly significant $P < 0.001$.

Observations

On analysis of *Aharajanidana Sevana* (intake of dietetic causes), maximum patients (80%) were taking *Pittaprapakopaka Ahara* (*Pitta* aggravating diet) followed by *Atiushnaahara* (very hot) (72.50%), *Atiguru* (eating of very heavy food) (65%), *Ajinarjanyaahara* (those food causing indigestion) (57.50%), *Atiamla* (very sour) (55%), *Vidahibhojana* (those food causing burning sensation) (52.50%), and *Viruddhasana* (foods which are incompatible combinations) (47.50%). *Vegavidharana* (suppressions of natural urges) was found in the majority of patients (90%) and *Divaswapa* (day sleeping after eating) was found in 62.50% of the patients. *Krodha* (anger), *Chinta* (anxiety), and *Bhaya* (fear) were found in 50%, 42.50%, and 15% of the patients, respectively. The majority of the patients were having *Hrit-Kanthadaha* (92.50%) and *Amlodgara* (90%). *Utklesh* and *Aruchi* were observed in 75% and 70% of patients, respectively.

Results

The effectiveness of the treatment is considered positive on the basis of scoring pattern before treatment and after the completion of treatment. *Yashtimadhu* (*G. glabra*) group provided a significant improvement in *Avipaka* 63.11%, *Klama* 61.11%, *Utklesha* 65.35%, *Tikta-amlodgara* 67.64%, *Gaurava* 61.11%, *Hrit-kanthadaha* 69.00%, and *Aruchi* 40.42% [Table 1].

Jethimala (*T. nummularia*) provided significant relief in *Avipaka* (47.11%), *Klama* (53.19%), *Utklesha* (61.70%), *Tikta-Amlodgara* (60.00%), *Gaurava* (43.18%), *Hrit-Kanthadaha* (66.06%), and *Aruchi* (78.94%) [Table 2].

While comparing the effect in between two groups, a statistically significant difference was found only in the symptom-*Aruchi*;

whereas in other symptoms such as *Avipaka*, *Klama*, *Utklesha*, *Tikta-Amlodgara*, *Gaurava* and *Hrit-Kanthadaha* was insignificant [Table 3].

In overall effect of therapies, of 18 patients who completed treatment in group A, 50% of the patients reported marked improvement followed by 38.89% mild improvement and 11.11% were moderate improvement. In group B, total 18 patients completed the treatment of which, maximum that is 44.44% patients reported marked improvement followed by 38.89% mild improvement and 16.67% moderate improvement. Both the treatments have marginal variation on overall effect [Table 4].

Discussion

On analysis of the *Aharajanyanidanas* (causative food factors), it was found that maximum patients were having faulty dietary habits, which causes vitiation of *Doshas* (bodily humor) and impairment of the normal digestive function. 80% of the patients were having the habit of taking *Pitta Prakopaka* (vitiating *Pitta*) *Ahara* which is one of the main causes for *Amlapitta*. *Amla Rasa* (sour taste) is *Pitta Prakopaka* due to its *Ushna* (hot) property. *Acharya Charaka* has mentioned *Amlapitta* in the list of *Ati Amla Rasa Sevanjanya Vyadhis* (diseases due to excessive intake of sour taste).^[11] *Vidahi Ahara Sevana* is found in 42.5% of the patients, this leads to increase in *Ushnata* (hotness) and *Vidagdhatta* of *Pitta*. 90% patients were having *Vegavidharana* and 62.50% having *Divaswapa*. Because of *Vegavidharana* and *Divaswapa*, even the diet which has been taken in proper quality and quantity does not get digested and leads to *Aamdosha*. All these things are responsible for the improper digestion of food and vitiation of *Doshas*. *Chinta* and *Krodha* were observed in 42.5% and 50% of the patients respectively. As *Acharya Charaka* mentioned, *Manasikabhavas* (mental factor) also play important role in the digestion of food. If a man is under psychological stress such as fear, anxiety, depression, digestion will not be proper even if he takes *Pathya Ahara*.^[12]

In *Hrit-Kanthadaha*, 69% improvement was found in group A, while 66.06% in group B. The *Dosha* involved in causing *Daha* is *Pitta*. In *Amlodgara*, 67.64% improvement was found in group A, while 60% in group B. It may be due to *Madhura Rasa*, *Madhura Vipaka* and *Pitta Shamana* property of *Yashtimadhu*. In *Utklesha*, 65.35% improvement was found in group A, while 61.70% improvement was found in group B. *Yashtimadhu* has been stated to be effective in *Chhardi* (vomiting) and included under *Chhardi Nigrahanagana* (anti emetics drugs) by *Charaka*. This property of the drug is validated by the results of the study. *Avipaka* is the symptom of *Agnidusti*, 63.11% relief in group A and 47.41% relief in group B. *Avipaka* may be due to *Pittadosha Vriddhi*, so in *Avipaka Yashtimadhu* may counter act the *Pitta Dosha* by its *Madhura Rasa* and *Sheeta Virya*. In *Aruchi*, 40.42% relief was found in group A while 78.94% relief in group B.

Rasa Nirdharana (identification of taste) of *Jethimala* (*T. nummularia*) revealed that the drug has *Madhura, Tikta Rasa*. According to *Acharya Charaka* *Tikta Rasa* is *Arochakagna* (bitter taste itself nonrelishing destroys disrelish), *Deepana* (appetiser) and *Pachana* (digestive).^[13] In *Aruchi*, *Jethimala* by virtue of

Table 1: Effect of *Glycyrrhiza glabra* root powder in group A

Symptoms	Mean		Difference	Percentage	SD	SEM	t	P
	BT	AT						
<i>Avipaka</i> (indigestion)	1.22	0.44	0.77	63.11	0.87	0.201	3.75	<0.01
<i>Klama</i> (exhaustion without any exertion)	0.66	0.27	0.38	57.57	0.60	0.14	2.71	<0.05
<i>Utklesha</i> (nausea)	1.27	0.44	0.83	65.35	0.98	0.23	3.58	<0.01
<i>Tikta-Amlodgara</i> (erectations with bitter or sour taste)	2.38	0.77	1.61	67.64	0.97	0.23	6.98	<0.001
<i>Gaurava</i> (feeling of heaviness of the body)	0.72	0.27	0.44	61.11	0.78	0.18	2.406	<0.05
<i>Hrit-Kanthadaha</i> (burning sensation in the chest and throat)	2.00	0.61	1.38	69.00	1.03	0.24	5.68	<0.001
<i>Aruchi</i> (loss of appetite)	0.94	0.55	0.38	40.42	0.50	0.11	3.28	<0.01

BT: Before treatment, AT: After treatment, SD: Standard deviation, SEM: Standard error of mean

Table 2: Effect of *Taverniera nummularia* root powder in Group B

Symptoms	Mean		Difference	Percentage	SD	SEM	t	P
	BT	AT						
<i>Avipaka</i> (indigestion)	1.16	0.61	0.55	47.41	0.51	0.12	4.61	<0.001
<i>Klama</i> (exhaustion without any exertion)	0.94	0.44	0.50	53.19	0.61	0.14	3.43	<0.01
<i>Utklesha</i> (nausea)	1.88	0.72	1.16	61.70	0.85	0.20	5.77	<0.001
<i>Tikta-Amlodgara</i> (erectations with bitter or sour taste)	2.50	1.00	1.50	60.00	0.78	0.18	8.09	<0.001
<i>Gaurava</i> (feeling of heaviness of the body)	0.88	0.50	0.38	43.18	0.50	0.11	3.28	<0.01
<i>Hrit-Kanthadaha</i> (burning sensation in the chest and throat)	2.77	0.94	1.83	66.06	0.61	0.14	12.57	<0.001
<i>Aruchi</i> (loss of appetite)	1.33	0.27	1.05	78.94	0.63	0.15	7.00	<0.001

BT: Before treatment, AT: After treatment, SD: Standard deviation, SEM: Standard error of mean

Table 3: Comparative effect of therapy

Symptoms	Group	n	Means difference	SD	SEM	t	P
<i>Avipaka</i> (indigestion)	A	18	0.77	0.87	0.20	0.928	>0.05
	B	18	0.55	0.51	0.12		
<i>Klama</i> (exhaustion without any exertion)	A	18	0.38	0.60	0.14	0.544	>0.05
	B	18	0.50	0.61	0.14		
<i>Utklesha</i> (nausea)	A	18	0.83	0.98	0.23	1.083	>0.05
	B	18	1.16	0.85	0.20		
<i>Tikta-Amlodagara</i> (erectations with bitter or sour taste)	A	18	1.61	0.97	0.23	0.376	>0.05
	B	18	1.50	0.78	0.18		
<i>Gaurava</i> (feeling of heaviness of the body)	A	18	0.44	0.78	0.18	0.253	>0.05
	B	18	0.38	0.50	0.11		
<i>Hrit-Kanthadaha</i> (burning sensation in the chest and throat)	A	18	1.38	1.03	0.24	1.562	>0.05
	B	18	1.83	0.61	0.14		
<i>Aruchi</i> (loss of appetite)	A	18	0.38	0.50	0.11	3.481	0.001
	B	18	1.05	0.63	0.15		

SD: Standard deviation, SEM: Standard error of mean

Table 4: Overall effect of therapy

Effect of therapy	Group A		Group B	
	n	Percentage	n	Percentage
Complete remission	-	-	-	-
Marked improvement	9	50.00	8	44.44
Moderate improvement	2	11.11	7	38.89
Mild improvement	7	38.89	3	16.67
Unchanged	-	-	-	-

its *Tikta Rasa* and *Deepana Pachana Karma* (carminative and digestive) showed better result than *Yashtimadhu*.

T. nummularia is one of the synonyms of *T. cuneifolia* (Roth.) Arn.^[14] Both the drugs *T. cuneifolia* and *G. glabra* were found to be similar phytochemically. At least eighteen chromatophores were found similar in both the plants including the sweetening principle, glycyrrhizin.^[15] The products of glycyrrhizin may be helpful in the treatment of peptic ulcers; they cause mucus production in the digestive tract and thickening of tissues. They also interfere with prostaglandins and can help in the healing of peptic ulcers. Glycyrrhizin acts in a similar manner to cortisone. It will have slight to moderate anti-inflammatory effects. *G. glabra* have various pharmacological actions like; ulcer healing, anti-ulcerogenic, choleric effects, anti-bacterial, antioxidant activity, and memory enhancing activity with

good convincing results.^[16] *T. cuneifolia* is also proved for gastro protective and antioxidant activity.^[17] By virtue of these activities, both drugs useful in the management of the various symptoms of *Amlapitta*. In general, these results suggest that, *G. glabra* and *T. nummularia* can be used in the management of *Amlapitta*.

Amlapitta is a *Pitta* dominant disease in which *Agni Vaishmya* (*Agnimandaya*) (improper body fire), *Pitta-Prokopa*, *Rasavaha* (channels that carry the nutrient body fluid), *Annahava* (channels that carry the ingested food) and *Purishavaha Srotasa Dushti* (vitiation in channels carrying fecal matter) occurs. According to textual references, it is clearly quoted that *Pitta-Shamakadravya* is generally advised for the management of *Amlapitta*.

Yashtimadhu is having *Madhura Rasa*, *Guru Guna*, *Sheeta Virya* and *Madhura Vipaka*, it is *Pitta-Vata Shamaka* (*Pitta-Vata* pacifying) and is *Dahashamaka*, *Balya* (tonics), *Glani* (depression of mind), and *Kshayahara* (relieving wasting disorders).^[18] *Madhura Rasa* and *Sheeta Virya* of *Yashtimadhu* acts by decreasing the vitiation of *Pitta Dosha*. *Amlapitta* is a *Pittaja Vyadhi*, where some association of *Vata* can also be traced. *Yashtimadhu* is having *Pitta-Vatashamaka* property, and could work in *Samprapti Vighatana* (breakdown in the pathogenesis) of *Amlapitta*. From the organoleptic characters and *Rasa Nirharana* of *T. nummularia* it was observed that the drug possesses *Madhura*, *Tikta Rasa*. Both the drugs *G. glabra* (*Yashtimadhu*) and *T. nummularia* (*Jethimala*) possess *Pittashamaka* property and helps in the management of *Amlapitta*.

Conclusion

Yashtimadhu (*G. glabra* Linn.) and *Jethimala* (*T. nummularia* Baker.) are effective in relieving the cardinal symptoms. Significant improvement observed in almost all the symptoms in both the groups but group A (*G. glabra*) showed better effect than group B and but in *Aruchi* *T. nummularia* showed better effect than *G. glabra*. Therefore, *Jethimala* can be used as a substitute for *Yashtimadhu*.

Financial support and sponsorship

IPGT and RA, Gujarat Ayurved University, Jamnagar.

Conflicts of interest

There are no conflicts of interest.

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हिन्दी सारांश

अम्लपित्त के प्रबंधन में यष्टीमधु एवं जेठीमल के मूल का तुलनात्मक चिकित्सकीय अध्ययन

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अनियमित आहार की आदतों, दोषपूर्ण आहार, व्यस्त जीवन शैली जो समाज में है इसी कारण अम्लपित्त वर्तमान युग में बहुत ही सामान्य व्याधि है। अम्लपित्त में जेठीमल (टेवेरनेरीरा नुमूलेरिआ बेकर.) और यष्टीमधु (ग्लिसराइझा ग्लेब्रा लिन.) के चिकित्सकीय प्रभावकारिता का तुलनात्मक अध्ययन किया गया। इस वर्तमान अध्ययन में, अम्लपित्त की कुल 80 रोगियों का पंजीकरण किया गया और यादृच्छिकता से दो समूहों में विभाजित किया गया। समूह ए में यष्टीमधु मूल चूर्ण और समूह बी में जेठीमल मूल चूर्ण, पानी के साथ दो सप्ताह के लिए, 2 ग्राम मात्रा में, दिन में 3 बार दिया गया। ग्रुप ए में 98 रोगियों ने तथा ग्रुप बी में भी 98 रोगियों ने इलाज पूरा किया। दोनों दवाएँ अम्लपित्त के प्रबंधन में प्रभावी पायी गयी। दोनों दवाओं से अम्लपित्त के आत्म लक्षण में राहत मिली। तिक्त-अम्लोद्गार ग्रुप ए में 76.68% और समूह बी में 60%, हृत्कण्ठ दाह 69% ग्रुप ए में और ग्रुप बी में 66.06%, उत्क्लेश ग्रुप ए में 64.36% और समूह बी में 69.70% राहत मिली। इस अध्ययन से स्पष्ट है कि, जेठीमल अम्लपित्त के प्रबंधन में यष्टीमधु के पर्याय में इस्तेमाल किया जा सकता है।