

Effectiveness of Root Decoction of *Indigofera tinctoria* on Peptic Ulcer (*Gunmam*)

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Abstract This study is Quasi-experimental clinical trial to determine the effectiveness of root decoction of *Indigofera tinctoria* in the management of Peptic ulcer (*Gunmam*). It also determines the association of Peptic ulcer with hereditary, food habits, physical activities and mental disturbances. The plant *Indigofera tinctoria* belongs to the family Fabaceae which popularly known as *Avuri* in Tamil. It is low shrub. Peptic ulcer disease is a problem of the gastrointestinal tract. The researcher administered questionnaire was used to collect the data. Ten (10) patients were selected clinically during the period of May 2015 to June 2015 at the Rural Ayurvedic hospital, Kopalapuram. Patients were treated with 40ml of root decoction. Evaluation visits were made at baseline, 7th day, 14th day, 21st day, 27th day, 33rd day and 40th day. Effect of treatment was evaluated on changes in the sign and symptoms. Clinical parameters were analyzed by scores as difference between the visits on first day of treatment and after treatment. Statistically highly significant improvement ($p < 0.001$) in heart burn, epigastric pain, indigestion, nausea & vomiting and eructation were observed in each visit while mean reduction also highly marked. On the basis of results and findings of this study shows remarkable reduction of degree of symptoms with highly significant improvement of the selected symptoms such as heart burn, epigastric pain, indigestion, nausea & vomiting and eructation.

Keywords *Indigofera Tinctoria*; *Gunmam*; *Peptic Ulcer*; *Decoction*

1. Introduction

Gunmam is a disease which is characterized by indigestion, burning sensation in stomach, vomiting, reduction in body strength, emaciation and depression.

Moreover air increase inside the stomach cause pain resembling that of ball rolling subsequent to indigestion this disease referred as *Gunmam*. Because it makes the patient to bend forward during attack of pain. During attack of pain patient psychologically get affected (Sanmugavelu, 2010) and (Kuppusami Muthaliyar, 2004).

This is the Quasi-experimental study to determine the internal administration of root decoction of *Indigofera tinctoria* (*Avuri*) in the treatment of *Gunmam* patients. *Gunmam* is compared with Peptic ulcer in modern aspect.

Gunmam is characterized by severe stomach pain to the patients to the extent that the patient usually assumes a bent forward position in order to get relief from the pain (Sreeramakrishna, 2015).

“thj ge;j njhe;jkpy;yhJ Fd;kk; tuhJ”

The patient suffering from this disease will lean forward due to pain. Hence it is named as *Gunmam*. The other name for *Gunmam* in Siddha is *Gulmam* (Kuppusami Muthaliyar, 2004).

The common features of this disease are indigestion, stomach irritation, vomit, decrease in body weight, loss of confidence. It is caused due to consumption of very hot food stuffs, gastritis inducing foodstuffs, water mixed with limestone, high consumption of coconut milk, stress, adequate temper, starvation and insomnia. According to Siddha system the *Gunmam* is classified into 8 types such as *Vaayu kunmam*, *Vaatha kunmam*, *Pitha kunmam*, *Eri kunmam*, *Vali kunmam*, *Satthee kunmam*, *Sanni kunmam* and *lya kunmam* (Sreeramakrishna, 2015).

The term 'Peptic ulcer' refers to an ulcer in the lower oesophagus, stomach or duodenum, in the jejunum after surgical anastomosis to the stomach or rarely, in the ileum adjacent to a Meckel's diverticulum. Ulcers in the stomach or duodenum may be acute or chronic; both penetrate the muscularis mucosae but the acute ulcer shows no evidence of fibrosis. Erosions do not penetrate the muscularis mucosae (Brain Walker, 2014).

The prevalence of Peptic ulcer (0.1-0.2%) is decreasing in many Western communities as a result of widespread use of *Helicobacter pylori* eradication therapy but it remains high in developing countries. The male to female ratio for duodenal ulcer varies from 5:1 to 2:1, whilst that for gastric ulcer is 2:1 or less. Chronic gastric ulcer is usually single; 90% are situated on the lesser curve within the antrum or at the junction between body and antral mucosa. Chronic duodenal ulcer usually occurs in first part of the duodenum and 50% are on the anterior wall (Brain Walker, 2014).

Peptic ulcer disease is a problem of the gastrointestinal tract characterized by mucosal damage secondary to pepsin and gastric acid secretion. It usually occurs in the stomach and proximal duodenum; less commonly, it occurs in the lower oesophagus, the distal duodenum, or the jejunum, as in unopposed hyper secretory states such as Zollinger-Ellison syndrome, in hiatal hernias (Cameron ulcers), or in ectopic gastric mucosa (e.g., in Meckel's diverticulum) (Kalyanakrishnan Ramakrishnan, 2007).

The number of diseases treated with herbs which are common in Siddha System of medicine. The herbs used in different forms for various diseases. There are many specific herbs available to cure peptic ulcer. *Indigofera tinctoria* (*Avuri*) is one such herb. In the Siddha system this herb is considered to be effective medicine for Peptic ulcer (Murugesu Muthaliyar, 2008).

The plant *Indigofera tinctoria* belongs to the family Fabaceae which popularly known as Neeli in Tamil. A low shrub, 60-120cm tall with numerous, virgate, slightly angular branches, more or less covered with white adpressed hairs; leaves alternate, imparipinnate, rachis 3.7-5cm long, adpressed pilose, leaflets 7-11, shortly stalked with minute stipels, about 1.2-1.8cm long; flowers irregular, bisexual, small, pink, on short, slender pedicels: fruit a many seeded, cylindrical legume, 2.5-3cm long, linear, straight curved (Jayaweera, 2006).

According to *Kunapadam (muthal paham) Porutpanbu nool*

“**Gunma muthal panno yozhiyum**” indicates root of *Avuri* cures Peptic ulcer.

Peptic ulcer is common gastrointestinal disorder. There are number of medicines available in allopathic and indigenous medical system for peptic ulcer. However the prevalence of Peptic ulcer is increased due to the life style pattern. Therefore researcher try to prove the root of *Indigofera tinctoria* can cure the Peptic ulcer which states in *Gunapadam* part-1 (Murugesu Mutheliyar, 2008).

2. Objective of the Research

To identify the effectiveness of root decoction of *Indigofera tinctoria* on Peptic ulcer (*Gunmam*)

3. Methodology

This is a Quasi-Experimental study. In this study, Peptic ulcer patients were selected based on inclusive criteria and exclusive criteria at the Rural Ayurvedic hospital, Kopalapuram. The selected drugs were administered for forty days with seven intervention treatment arms.

3.1. Study Area

The study area was the Kopalapuram in Trincomalee district. The study was carried on Rural Ayurvedic Hospital, Kopalapuram.

3.2. Study Design

This is a randomized clinical trial. Peptic ulcer patients, according to the inclusive criteria, were selected at the Rural Ayurvedic hospital, Kopalapuram during May 2015-June 2015. The selected patients were treated with selected drugs. The selected drugs were administered for forty days with seven intervention treatment arms. All the selected patients were interviewed by the researcher on their first visit to the OPD. They were assured that all information obtained from them would be strictly confidential.

Treatment allocation depended only on the time sequence in which patients entered the study, thus minimizing selection bias. The drug selected for this study was prepared by researcher. Ten patients were selected. These patients were selected within the study time frame (May 2015- June 2015), using inclusion and exclusion criteria based on the signs, symptoms of Peptic ulcer in the first phase of the screening procedure. The purpose of the trial was explained to the patients and those who volunteered signed 'informed consent' to enrol in the trial (The 'informed consent' form is shown in Annexure II).

3.3. Selection of Peptic Ulcer Patients

Ten patients were selected for this study. Patients were selected based on inclusive and exclusive criteria.

Patients between the age group of 20-60 years, both sexes presenting with the sign and symptoms of Peptic ulcer were randomly selected from Outpatients Department of the Rural Ayurvedic Hospital, Kopalapuram and were subjected to clinical examination. During the period of study (May 2015 -

June 2015), 10 patients were examined by the researcher for Peptic ulcer at the Rural Ayurvedic hospital, Kopalapuram.

These patients were subjected to a detailed clinical examination based on proforma especially prepared for this study.

Diagnosis was made on the basis of the history and physical examination.

The following physical examination was made by the researcher;

1. *Addavitha patidchai (villi, molli, navu, naddi, malam, siruner, sparisam, niram)*
2. Blood Pressure and Pulse
3. In systemic examination special emphasis was given to the Gastrointestinal System. In addition to this Cardiovascular System and Respiratory System were also examined by the researcher.

3.4. Inclusion Criteria

Patients were selected in either gender and between the age group of 20 - 60 years. Diagnosis of peptic ulcer based on typical history.

Any three of following sign and symptoms,

- Epigastric pain
- Heart burn
- Indigestion
- Eructation
- Nausea and vomiting

3.5. Exclusion Criteria

Pregnant & lactating mother

Patient with ongoing medication of peptic ulcer in Allopathic system.

Patient below the age of 19 years and above the age of 61 years

Patient with ongoing medication for any disease

3.6. Purification and Preparation of Drug

Plant material (root) was collected and purified by removing sand, small stones, washed with water, boiled in milk and dried in shade. Finally researcher has obtained the purified *Avuri* root. The drug was prepared by standard method for decoction (Pon Ramanathan, 2000). Raw material of root of *Indigofera tinctoria* - 35g and Water - 625ml

3.7. Instrument

The instrument used in this study is an interviewer (researcher) administrated questionnaire or proforma. In addition to responses to specific questions, notes were made on information obtained by examination. The follow-up of the patients were recorded at every one week interval. These questions were prepared based on specific objectives.

It was heated and reduced into 1/8th (~80ml).

3.8. Data Collection

Ten patients were selected for this study. Patients were selected based on inclusive and exclusive criteria.

Patients between the age group of 20-60 years, both sexes presenting with the sign and symptoms of Peptic ulcer were randomly selected from Outpatients Department of the Rural Ayurvedic Hospital, Kopalapuram and were subjected to clinical examination. During the period of study (May 2015 - June 2015), 10 patients were examined by the researcher for Peptic ulcer at the Rural Ayurvedic hospital, Kopalapuram.

The purpose of trial was explained to the patient to get their consent a selected patient was interviewed by the researcher on their first visit to the OPD. The patient were subjected to a detailed clinical examination based on proforma specially prepared this study. Diagnosis will be made on the basis of history and clinical examination.

3.9. Treatment

All selected patient were treated with 40ml of *Avuriver kudineer* twice a day for 40 days.

3.10. Clinical Evaluation

Evaluation visit were made at base line and once in a week for 06 weeks. Effect of treatment was evaluated on the basis of changes in the signs and symptoms after the treatment.

Epigastric pain, heart burn, indigestion, nausea & vomiting and eructation were considered as clinical parameters and changes were recorded at every visit.

Clinical parameters were analyzed by score as difference between the visits on first day of the treatment, seventh day, fourteenth day, twenty-first day of the treatment and end of the treatment (40th day).

Clinical signs and symptoms of each patient were assessed on the basis of changes in signs and symptoms of the disease.

3.11. Data Analysis

The data was analysed using the Statistical Package for Social Sciences (SPSS) version16. Dependent variables and independent variables (chief complaint, food aggravating the symptoms, physical activities aggravating symptoms, family history, and patient's satisfaction) are used to measure the effectiveness of decoction of *Indigofera tinctoria*.

4. Results and Discussion

Results of clinical trial were considered in 10 patients with Peptic ulcer. Results are presented after treatment on 7th day, 14th day, 21st day and 40th day.

4.1. Effect of Drug on Heartburn

Table 1: Effect of drug on Heartburn

Symptom (Epigastric pain)	Before treatment	After treatment			
		7 th day	14 th day	21 st day	40 th day
Mean	1.800	0.600	0.100	0.000	0.000
Mean reduction	-	1.200	1.700	1.800	1.800
Standard deviation	-	0.632	0.675	0.789	0.789
Standard Error Mean	-	0.200	0.213	0.249	0.249
df	-	9	9	9	9
Paired "t"	-	6.000	7.965	7.216	7.216
P	-	<0.001	<0.001	<0.001	<0.001

The Table 1 indicates marked reduction in heartburn in patients with Peptic ulcer as measured on 7th day, 14th day, 21st day and 40th day. Patients showed significant improvement.

Statistically highly significant improvement ($p < 0.001$) in heartburn was observed in 7th day, 14th day, 21st day and 40th day in patients with Peptic ulcer (based on paired T test) while mean reduction of heartburn in Peptic ulcer is highest indicating the effect of the drug.

4.2. Effect of Drug on Epigastric Pain

Table 2: Effect of drug on Epigastric pain

Symptom (Indigestion)	Before treatment	After treatment			
		7 th day	14 th day	21 st day	40 th day
Mean	1.40	0.40	0.00	0.00	0.00
Mean reduction	-	1.00	1.40	1.40	1.40
Standard deviation	-	0.667	0.699	0.699	0.699
Standard Error Mean	-	0.211	0.221	0.221	0.221
df	-	9	9	9	9
Paired "t"	-	4.743	6.332	6.332	6.332
P	-	0.001	<0.001	<0.001	<0.001

Statistically highly significant improvement ($p < 0.001$) in epigastric pain was observed in 7th day, 14th day, 21st day and 40th day in patients with Peptic ulcer (based on paired T test) while mean reduction of epigastric pain in Peptic ulcer is highest indicating the effect of the drug.

The Table 2 indicates marked reduction in epigastric pain in patients with Peptic ulcer as measured on 7th day, 14th day, 21st day and 40th day. Patients showed significant improvement.

4.3. Effect of Drug on Indigestion

Table 3: Effect of drug on Indigestion

Symptom (Indigestion)	Before treatment	After treatment			
		7 th day	14 th day	21 st day	40 th day
Mean	1.40	0.40	0.00	0.00	0.00
Mean reduction	-	1.00	1.40	1.40	1.40
Standard deviation	-	0.667	0.699	0.699	0.699
Standard Error Mean	-	0.211	0.221	0.221	0.221
df	-	9	9	9	9
Paired "t"	-	4.743	6.332	6.332	6.332
P	-	0.001	<0.001	<0.001	<0.001

Statistically highly significant improvement ($p < 0.001$) in indigestion was observed in 7th day, 14th day, 21st day and 40th day in patients with Peptic ulcer (based on paired T test) while mean reduction of indigestion in Peptic ulcer is highest indicating the effect of the drug.

The Table 3 indicates marked reduction in indigestion in patients with Peptic ulcer as measured on 7th day, 14th day, 21st day and 40th day. Patients showed significant improvement.

4.4. Effect of Drug on Nausea & Vomiting

Table 4: Effect of drug on Nausea & vomiting

Symptom (Eructation)	Before treatment	After treatment			
		7 th day	14 th day	21 st day	40 th day
Mean	1.60	0.70	0.00	0.00	0.00
Mean reduction	-	0.90	1.60	1.60	1.60
Standard deviation	-	0.316	0.843	0.843	0.843
Standard Error Mean	-	0.100	0.267	0.267	0.267
Df	-	9	9	9	9
Paired "t"	-	9.000	6.000	6.000	6.000
P	-	<0.001	<0.001	<0.001	<0.001

Statistically highly significant improvement ($p < 0.001$) in nausea and vomiting was observed in 7th day, 14th day, 21st day and 40th day in patients with Peptic ulcer (based on paired T test) while mean reduction of nausea and vomiting in Peptic ulcer is highest indicating the effect of the drug.

The Table 4 indicates marked reduction in nausea and vomiting in patients with Peptic ulcer as measured on 7th day, 14th day, 21st day and 40th day. Patients showed significant improvement.

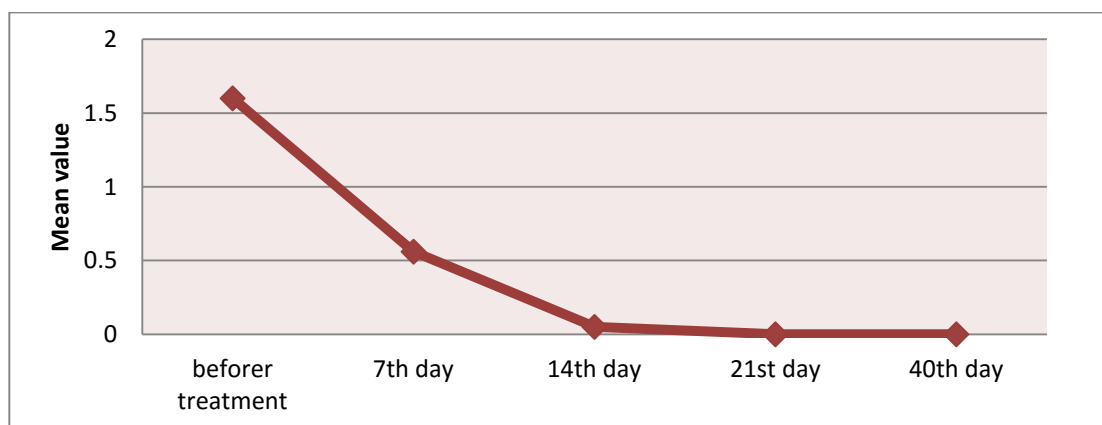
Table 5: Effect of drug on eructation

Symptom (Eructation)	Before treatment	After treatment			
		7 th day	14 th day	21 st day	40 th day
Mean	1.60	0.70	0.00	0.00	0.00
Mean reduction	-	0.90	1.60	1.60	1.60
Standard deviation	-	0.316	0.843	0.843	0.843
Standard Error Mean	-	0.100	0.267	0.267	0.267
Df	-	9	9	9	9
Paired "t"	-	9.000	6.000	6.000	6.000
P	-	<0.001	<0.001	<0.001	<0.001

Statistically highly significant improvement ($p < 0.001$) in eructation was observed in 7th day, 14th day, 21st day and 40th day in patients with Peptic ulcer (based on paired T test) while mean reduction of eructation in Peptic ulcer is highest indicating the effect of the drug.

The Table 5 indicates marked reduction in eructation in patients with Peptic ulcer as measured on 7th day, 14th day, 21st day and 40th day. Patients showed significant improvement.

4.5. Overall Effect of Treatment

**Figure 1:** Overall effect of treatment

Effectiveness is explained on the basis of *Rasa*, *Veeriya*, *Vipaka*, action and properties of *Vāta* and *Pitta*.

Gunmam (Peptic ulcer) is one of *Vatharogam*. Vitiated *Vāta* lodged in stomach. Hence to treat *Gunmam* drugs acting on *Vāta* and *Amashaya* (stomach) should be selected. In the *Amashaya* (diseases in the stomach) the treatment should be given bitter substance. In the root decoction of *Indigofera tinctoria* has bitter taste. Bitter taste has *vayu* and *akashsa Mahabhutas* in dominance. Hence it has got affinity towards some locations like *Amashaya*. Though, bitter aggravates *vayu* which may enhance the pathogenic process of *Gunmam* and main *dosha* involved in *Gunmam* is *vayu*.

The trial drug i.e., *Indigofera tinctoria* has bitter taste, *Ushna Viriya* and pungent (*Karppu*) *Vipaka*.

Bitter taste has got *Deepana* (facilitate digestion) and *Pachana* (augment digestion) properties. So it helps to improve the digestion and helps in the management of Peptic ulcer. Bitter taste may act as anti-inflammatory agent and can reduce the inflammation in the stomach. *Madhura* and *Karppuu Vipaka* are pacifying the *Vāta* vitiation.

Above explanation has been supported by the results obtained from this study. Therefore the quotation for general character of *Indigofera tinctoria* is proven from the above scientific study for the Peptic ulcer.

5. Conclusion

On the basis of results and findings of this Quasi-experimental clinical trial on root decoction of *Indigofera tinctoria* for Peptic ulcer show remarkable reduction of degree of symptoms with highly significant improvement of the selected symptoms such as heart burn, epigastric pain, indigestion, nausea & vomiting and eructation.

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