Evaluation of the Effectiveness of Decoction of *Allium cepa* on Peptic Ulcer

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ABSTRACT

Introduction: The plant *Allium cepa* belongs to the family Amaryllidaceae which is popularly known as *Irravengayam* in Tamil. A perennial herb usually grown as an annual, 15-50 cm high with ovoid, red, subterranean bulbs. 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. Signs and symptoms of *Gunmam* are comparable with the signs and symptoms of peptic ulcer in modern aspect. *Gunmam* is a disease which is characterized by indigestion, burning sensation in stomach, vomiting, decreased body strength, emaciation and stress. This study is an observational open labeled clinical trial to determine the effectiveness of bulb decoction of *Allium cepa* in the management of peptic ulcer. It also determines the association of peptic ulcer with hereditary, food habits, physical activities and mental disturbances. **Methods:** In this research questionnaire was implemented to collect the data. Ten (10) patients were selected clinically during the period of Sep 2016- Nov 2016 at the Rural Ayurvedic hospital, Kopalapuram. Patients were treated with 40ml of root decoction. Evaluation visit were made at base line and once in a week for 06 weeks. 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. **Results:** Statistically highly significant improvement (p<0.001) in heart burn, epigastric pain, indigestion, nausea and vomiting and eructation were observed in each visit while mean reduction also highly marked. **Conclusion:** On the basis of results and findings, 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.

KEY WORDS

Allium cepa, Decoction, *Gunmam,* Peptic Ulcer

1. INTRODUCTION

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 to not penetrate the muscularis mucosae[1].

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, while 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 the first part of the duodenum and 50% are on the anterior wall[1].

The plant *Allium cepa* belongs to the family Amaryllidaceae which popularly known as *Irravengayam* in Tamil. A perennial herb usually grown as an annual, 15-50 cm high with ovoid, red, subterranean bulbs, 1.5-2.5 cm diameter, with accessory bulbs giving off slender fibrous roots below[2].

According to Gunapadam (Part I) Porutpanbu nool

"*VengayaViththu Gunmam Vveettum*"

As per the above quotation, *Allium cepa* cures the *Gunmam*. The signs and symptom of Gunmam is similar to the peptic ulcer diseases.

Peptic ulcer is a 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 *Allium cepa* can cure the peptic ulcer as stated in *Gunapadam*[3].

Objective of the current research is to identify the effectiveness of bulb decoction of *Allium cepa* on Peptic ulcer (*Gunmam*).

3. METHODOLOGY

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 an Observational open labeled 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 administrated 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 (Sep 2016- Nov 2016), 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 enrolled in this study.

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. 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.

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,
- o Epigastric pain
- o Heart burn
- o Indigestion

o   Eructation
o   Nausea and vomiting

3.5 Exclusion criteria
o   Pregnant & lactating mother.
o   Patient with ongoing medication of peptic ulcer in Allopathic system.
o   Patient below the age of 19 years and above the age of 61 years.
o   Patient with ongoing medication for any disease.

3.6 Preparation of drug
The drug was prepared by using standard method for prepare decoction mentioned in the Siddha Pharmacopeia. For 35 g of Allium cepa, 560 ml water was added, boiled and reduced to 1/8th (70 ml)

3.7 Treatment
All selected patients were treated with 40ml of *Allium cepa* decoction twice a day for 40 days.

3.8 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.

3.9. 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.

3.9 Ethical clearance
Ethical clearance has been obtained from Ethical Review Committee, Institute of Indigenous Medicine, University of Colombo.

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
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
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.

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.

4.3. Effect of drug on Indigestion
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.

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.

4.4. Effect of drug on Nausea and vomiting

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.

4.5. Effect of drug on Eructation

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.

4.6. Overall effect of treatment

Graph 1 indicates that signs and symptom of Peptic ulcer were recovered on 7th day after the treatment. Graph 2 indicates that the gradual reduction of mean value of the each sign and symptom.

Table 1. Effect of drug on Heartburn

Symptom (Heartburn)	Before treatment	After treatment			
		7th day	14th day	21st day	40th day
Mean	2.30	1.60	1.50	1.30	1.20
Mean reduction	-	0.70	0.80	1.00	1.10
Standard deviation	-	0.527	0.527	0.472	0.421
Standard Error Mean	-	0.166	0.166	0.149	0.133
Df	-	9	9	9	9
Paired "t"	-				6.128
P	-				<0.001

Table 2. Effect of drug on Epigastric pain

Symptom (Epigastric pain)	Before treatment	After treatment			
		7th day	14th day	21st day	40th day
Mean	2.400	1.200	1.200	1.500	1.300
Mean reduction	-	1.200	1.200	0.900	1.100
Standard deviation	-	0.421	0.421	0.527	0.472
Standard Error Mean	-	0.133	0.133	0.166	0.149
Df	-	9	9	9	9
Paired "t"	-				4.714
P	-				0.001

Table 3. Effect of drug on Indigestion

Symptom (Indigestion)	Before treatment	After treatment			
		7th day	14th day	21st day	40th day
Mean	2.00	1.10	1	1	1
Mean reduction	-	0.9	0.9	1	1
Standard deviation	-	0.547	0.547	0.000	0.000
Standard Error Mean	-	0.172	0.172	0.000	0.000
Df	-	9	9	9	9
Paired "t"	-				6.708
P	-				<0.001

Table 4. Effect of drug on Nausea & vomiting

Symptom (Nausea & vomiting)	Before treatment	After treatment			
		7th day	14th day	21st day	40th day
Mean	2.1	1	1	1	1
Mean reduction	-	1.10	1.10	1.10	1.10
Standard deviation	-	0.000	0.000	0.000	0.000
Standard Error Mean	-	0.000	0.000	0.000	0.000
Df	-	9	9	9	9
Paired "t"	-				11
P	-				<0.001

Table 5. Effect of drug on Eructation

Symptom (Eructation)	Before treatment	After treatment			
		7th day	14th day	21st day	40th day
Mean	2.1	1.2	1	1	1
Mean reduction	-	0.90	1.1	1.1	1.1
Standard deviation	-	0.421	0.000	0.000	0.000
Standard Error Mean	-	0.133	0.000	0.000	0.000
Df	-	9	9	9	9
Paired "t"	-				11
P	-				<0.001

Graph 1. Overall effect of treatment
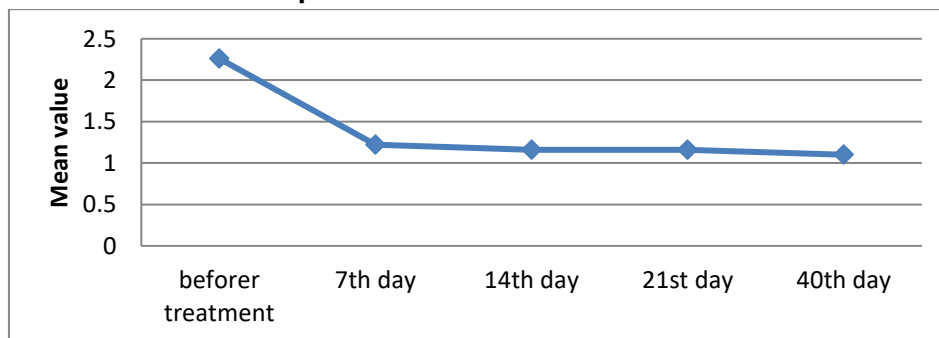
Graph 2. Over all changes of each symptom with the intervention
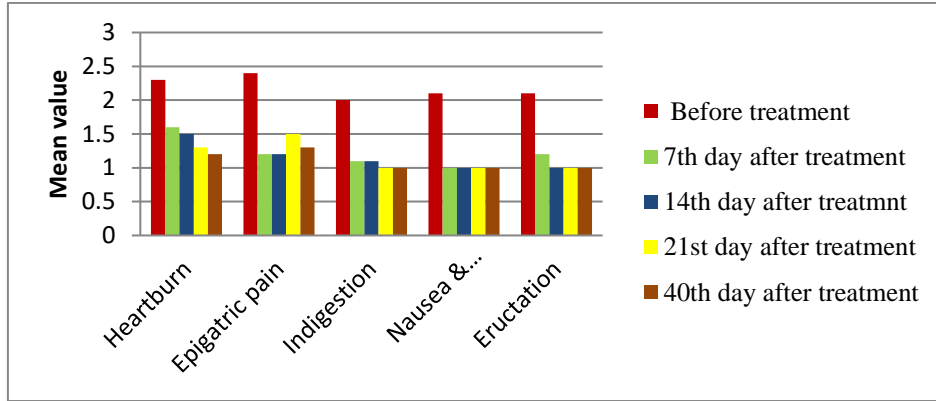
4.7 Explanations for the effectiveness of trial drug in *Gunmam* (Peptic ulcer)

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. The decoction of *Allium cepa* has bitter taste. Bitter taste has *vayu* and *akashsabMahabhutas* 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., *Allium cepa* 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 *Allium cepa* is proven from the above scientific study for the Peptic ulcer.

5. Conclusion

On the basis of results and findings of this Observational open labeled clinical trial. The decoction of bulb of *Allium cepa* 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 in peptic ulcer subjects.

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