Comparative clinical evaluation on herbal formulation Pepsil, Safoof-e-Katira and Omeprazole in gastro esophageal reflux disease

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Abstract: This study was conducted to evaluate the role of Unani herbal drugs *Pepsil* and *Safoof-e-katira* on the gastro esophageal reflux disease (GERD). This was multicentre randomized case control study conducted at *Matab Hakeem Muhammad Noor-ud-din, Burewala; Aziz Muhammad din Medical and Surgical Centre, Burewala and Shifa-ul-mulk Memorial Hospital, Hamdard University Karachi*. The patients were selected according to inclusion and exclusion criteria. In test group-1 the male female ratio was 40%, 60%; test group-2 was 42%, 58% and in control group was 44%, 56% respectively. The observed symptoms in the study were increased appetite (TG-1-95%, TG-2-95% and CG-89%), difficulty in swallowing (TG-1-93%, TG-2-96% and TC-94%), belching/burping (TG-1-97%, TG-2-97% and CG-95%), vomiting (TG-1-90%, TG-2-96% and CG-89%), heart burn (TG-1-100%, TG-2-100% and CG-98%), palpitation (TG-1-100%, TG-2-100% and CG-97%), epigastric pain (TG-1-97%, TG-2-97% and CG-90%), abdominal cramps (TG-1-97%, TG-2-98% and CG-95%), tenesmus (TG-1-100%, TG-2-100% and CG-97%), flatulence (TG-1-100%, TG-2-75% and CG-95%), wakeup during sleep (TG-1-94%, TG-2-87% and CG-94%). The p-value of the results of the symptoms was 0.000 except flatulence where the value was 0.001. The statistical results of the study prescribed that all the drugs studied (*Pepsil*, *Safoof-e-katira* and *Omeprazole*) are highly significant. The herbal coded drug Pepsil showed no side effects and unani herbal drug safoof-e-*katira* showed minimum result of 75% in the patients while *Omeprazole* resulted with some side effects. In the result it can be concluded that the herbal coded drug *Pepsil* is a potent herbal drug for gastro esophageal reflux disease.

Keywords: Gastro Esophageal Reflux Disease (GERD), Pepsil, heart burn, Epigastric pain.

INTRODUCTION

The gastrointestinal tract is responsible for the digestion of the food that attributed through chemical and mechanical processes. It provides nutrients, fluids and electrolytes to the body and excretes out waste products. It consists of a group of organs that includes liver, pancreas and GI tract, which metabolize nutrients, medicine and other exogenous materials (Proctor, 2008). Gastro esophageal reflux is a physiological action that consists of unwilling expulsion of stomach contents in the esophagus that causes heart burn. It is a common practice characterized by heart-burn, acid regurgitation and with or without mucosal damage (Kahrilas, 2003). Usually it may not produce any damage to the mucosa. If there is any pathology involved, mucosal damage is sure. In 40% of the patients, the endoscopic findings are observed while 60% patients have no endoscopic results of heart burn (Orlando, 2008).

Physiology of esophagus

Esophagus is an initial part of the digestive system that delivers food from oral cavity to stomach. It consists of two high-pressure zones called lower esophageal sphincter and upper esophageal sphincter. The upper esophageal sphincter is controlled by the cricopharyngeus muscle and remains close all the times to prevent inspired air to esophagus and esophageal contents to oropharynx. During the swallowing process, the swallowing center in the brain located in the medulla oblongata passes impulses towards upper esophageal sphincter and lower esophageal sphincter's skeletal muscles and smooth muscles through vagus nerve are carried by vagal postganglionic or pre-ganglionic cholinergic fibers, respectively, to pass the food. The acetylcholine contracts the skeletal muscles of the esophagus and smooth muscles are contracted by the vasoactive intestinal peptide and nitric oxide. There are three type of protecting mechanism systems are also involved during the process of swallowing to protect esophagus from the gastric acid reflux injury. These are:

Ant reflux barriers-frequency limitation of the reflux
Luminal clearance mechanism-fasten the passing through the esophagus
Tissue resistance-minimize epithelial contact to avoid damage

Physiology in unani perspective

Al-Tibri (1994) in his book Firdos-al-Hikmat-fi-Tibb state that the temperament of the esophagus is *"Cold and Dry"*. The stomach is the most sensitive internal organ of

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the body even from heart and liver therefore the stomach pain cause mental pressure that ultimately cause insanity. The lack of appetite is the result of increased level of hotness in the stomach and increased appetite with slow digestive process refers that the temperament of the stomach goes towards the coldness. He also prescribed gastro esophageal reflux disease as "it is muscular disorders of the esophagus in which the tonicity of the muscles that controls the esophageal sphincter decreases and they remain relax, as a result the sphincter remains open".

In the world over both developed and developing countries, esophageal reflux is a common condition with different sign and symptoms but increasing rapidly around the globe (Edwin, 1998). Gastro esophageal reflux disease is not only the disease of the adults but it is also common in children (Vendenplas *et al.,* 2000). The patients having gastro esophageal reflux disease under the age of 12 years do not have heart bun while they have the symptoms of swallow difficulty, asthma and dry cough (Fennerty and Gold, 2007). Dettmar *et al.*, 2011 gave a detail account on reflux and its consequences the laryngeal, pulmonary and esophageal manifestations, 30% of adult population is affected by the gastro esophageal reflux disease. The classical esophageal symptoms such as heartburn and acid reflux often overlap with atypical symptoms that affect the respiratory tract which is termed as non-esophageal reflux disease or laryngopharyngeal reflux that appears chronic cough, laryngitis, hoarseness, voice disorders and asthma manifestations. The clinical and non-clinical proforma was preferred to find out the above mentioned condition. The refluxate of components such as acid, pepsin, bile acid and nonacid reflux, resulting from tissue damage and protection of the esophagus and laryngopharynx airways were analyzed. Clinical symptoms of reflux, the cause, including asthma, chronic cough, respiratory disease, were examined at length. In addition to strategies for diagnosis and treatment of gastro esophageal reflux disease thereafter finding the results of non-acid reflux were proposed to be rendered as inclusion criteria.

Clinical presentation

Commonly the reflux may be found in any age, but it affects mostly the age group of 20 to 50 years. Male and females are equally victimized, and both are hospitalized. But in men the endoscopic findings of esophageal damage are two to three fold more than females of China and West. Esophageal reflux has basic symptoms of epigastric pain that starts after one hour eating and may lasts up to two hours, aggravates with the spicy food, citrus food, tomato, onion and alcohol etc. It starts with heartburn, refers to epigastric pain along with regurgitation. If it happens during sleep the symptoms of hyper salivation and bitter taste are also found (Wienbeck and Barnert, 1989; Kay *et al.*, 1994; Chang *et al.*, 1997).

Galmiche *et al.*, 2006 have reported that functional esophageal disorders of the esophagus are associated with esophageal symptoms such as heartburn, chest pain, dysphagia, a globe. These could not view from the perspective of structural disorders, movement disorders based on histopathology or gastro esophageal reflux. Gastro esophageal reflux is taken into account of the diagnosis of reflux esophagitis or esophageal acid exposure there, episodes of acid reflux or respond to anti reflux treatment. Management methods that modulate the central symptom (perception, noxious stimuli) of the esophagus were excluded. All this has resulted in the understanding of the symptoms, the new strategies and give a way to diagnosis and treatment (Liker *et al.,* 2005).

Epidemiology

Gastro esophageal reflux disease is the commonest disease of the West due to the presence of the heart burn. Its prevalence in adults of United States is 10%, 20% and 45% daily, once a week and once a month respectively. Its presence in men is double to three fold than women and whites are the more victims than black. The endoscopic evidence for gastro esophageal reflux disease is found in only 10% of the patients. In China it is 1.5% to 5%, in Korea 2.7% and in Germany is 2%. A report about USA prescribed that weekly symptom of heart burn found in general population is 19.8% in 1997, while it was 14% in 1976 (Wienbeck and Barnert, 1989; Min *et al.*, 1996; Zhang *et al.*, 1996; Locke *et al.,*1997). The National Digestive Disease Information Clearinghouse report about the year 2004 shows that the 60 to 70 billion people face different type of digestive disease in total of US population and costs about 141.8 billion dollars, from which the role of gastro esophageal reflux disease was 20 % of the population. Nebel *et al.* (1976) and Everhart, (2008) prescribed that the prevalence was 20% of those who have the symptoms of gastro esophageal reflux disease at least once a week (). The prevalence and incidence of esophageal reflux in different regions of the world exhibit variation in their onset. These values are population dependent cited in different studies. If the population of the study depends upon the general population the frequencies may be lower as compared to medical facility patients for treatment plan. Endoscopic findings always have lower frequencies than symptomatic surveys that are only 10% of them (El-Serag and Peterson, 2004). A U.S. report published in 1997 prescribes that the heartburn in a week is found in 19.8% of the general population, which is higher than 1976 that was 14%. Fifteen years ago the reflux was rare in Nigeria. The recent frequencies of the heartburn leads to14% in Taiwan and the author convicts the factors of obesity, changing patterns of diet towards westernization and aging among the people of Taiwan that risks the reflux and its squeal (Ofoegbu, 1982; Hashem and El-Serag, 2007).

Table 1: Study design with parameter

Activity	Outline	Description
No. Of drugs for comparison	Test drug-1 Test drug-2 Control drug	*Pepsil* Safoof-e-*Katira* *Omeprazole*
No. Patients	50 + 50+50	150
Duration of treatment	4 weeks	Follow up 2 weeks after treatment
Dose	Test drug-1 bd Test drug-2 bd Control drug bd	2g of powder 2g of powder 20mg capsule
Total duration of study	2 years	January 2011 to 2013

Table 2: Sex distribution of test group-1

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	20	40.0	40.0	40.0
female	30	60.0	60.0	100.0
Total	50	100.0	100.0	

Table 3: Sex Distribution of Test Group-2

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	21	42.0	42.0	42.0
Female	29	58.0	58.0	100.0
Total	50	100.0	100.0	

Table 4: Sex Distribution of Control Group

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	22	44.0	44.0	44.0
Female	28	56.0	56.0	100.0
Total	50	100.0	100.0	

Table 5: Paired sample t-test before and after treatment on test group-1

Symptoms	Paired Differences					t	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Increased Appetite	1.360	.898	.127	1.105	1.615	10.708	49	.000
Swallowing Difficulty	.700	.614	.087	.525	.875	8.056	49	.000
Belching/Burping	1.020	.795	.112	.794	1.246	9.071	49	.000
Vomiting	.800	.782	.111	.578	1.022	7.230	49	.000
Heat Burn	1.960	.570	.081	1.798	2.122	24.315	49	.000
Palpitation	1.080	.804	.114	.851	1.309	9.498	49	.000
Epigastric Pain	1.640	.964	.136	1.366	1.914	12.032	49	.000
Abdominal Cramps	1.440	.837	.118	1.202	1.678	12.167	49	.000
Tenesmus	.680	.683	.097	.486	.874	7.037	49	.000
Flatulence	1.980	.795	.112	1.754	2.206	17.608	49	.000
Wakeup During Sleep	1.060	.818	.116	.827	1.293	9.158	49	.000

Methodology

Study design

Following these guidelines under the social and ethical measures the study was designed on randomized clinical trial of herbal coded drug *Pepsil* for the patients of gastro esophageal reflux disease. The patients were randomly assigned for the research project. Patient's history, sign and symptoms during the study and relevant clinical data were properly recorded on each visit. The study was carried out from January 2011 to January 2013.

Table 6: Paired Sample T-Test Before and After Treatment on Test Group-2

Symptoms	Paired Differences					t	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Increased appetite	1.320	.794	.112	1.094	1.546	11.758	49	.000
Swallowing difficulty	.720	.640	.091	.538	.902	7.953	49	.000
Belching/burping	1.140	.606	.086	.968	1.312	13.293	49	.000
Vomiting	.820	.825	.117	.585	1.055	7.025	49	.000
Heat burn	1.920	.444	.063	1.794	2.046	30.545	49	.000
Palpitation	1.160	.817	.116	.928	1.392	10.038	49	.000
Epigastric pain	1.640	.898	.127	1.385	1.895	12.913	49	.000
Abdominal cramps	1.640	.563	.080	1.480	1.800	20.605	49	.000
Tenesmus	.760	.625	.088	.582	.938	8.603	49	.000
Flatulence	1.540	.762	.108	1.324	1.756	14.299	49	.000
Wakeup during sleep	.880	.558	.079	.721	1.039	11.143	49	.000

Table 7: Paired sample t-test before and after treatment on control group

Symptoms	Paired Differences					t	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Increased appetite	1.360	.693	.098	1.163	1.557	13.880	49	.000
Swallowing difficulty	.900	.614	.087	.725	1.075	10.357	49	.000
Belching/burping	1.520	.707	.100	1.319	1.721	15.206	49	.000
Vomiting	1.040	.727	.103	.833	1.247	10.111	49	.000
Heat burn	2.020	.515	.073	1.874	2.166	27.752	49	.000
Palpitation	1.440	.760	.108	1.224	1.656	13.394	49	.000
Epigastric pain	1.940	.712	.101	1.738	2.142	19.275	49	.000
Abdominal cramps	1.740	.664	.094	1.551	1.929	18.523	49	.000
Tenesmus	.860	.729	.103	.653	1.067	8.345	49	.000
Flatulence	1.920	.695	.098	1.722	2.118	19.530	49	.000
Wakeup during sleep	1.040	.968	.137	.765	1.315	7.597	49	.000

Setting

The study was multi centered and based on clinical trial followed by the randomized selection of the patients. The trials were executed at *matab hakeem muhammad noor-ud-din chishti nizami, arif bazar Burewala, aziz muhammad din, medical and surgical center, lahore road, Burewala* both covers the area of the Burewala city and surroundings of about 40 villages and *shifa-ul-mulk memorial hospital for eastern medicine, Hamdard university, Karachi* cooping the surroundings of about the 27 villages.

Diagnostic technique

The prevalence of the gastro esophageal reflux disease is much more than the past now. It is due to the changing life style that is becoming more luxurious day by day due to the modern inventions and discoveries. To justify the study, a survey was conducted that proves the prevalence of digestive disorders in the businessmen community of Burewala and outdoor patients of the Shifa-ul-mulk memorial hospital for eastern medicine, Hamdard University, Karachi. It is needed to identify the prevalence, management and treatment of gastro esophageal reflux disease in the area which accounts for approximately 67% in the population.

Diagnostic technique for gastro esophageal reflux disease

All the included patients of the study are observed under the clinical sign and symptoms with in the period of two months relate to the gastro esophageal reflux disease.

Investigations

There may be different pathological and non-pathological reasons that cause gastro esophageal reflux disease. Some of the supportive findings of hemoglobin (Hb. Gm %), ALT (alanine transaminase), E.S.R (erythrocyte sedimentation rate) and creatinine were also collected to support the results.

Clinical diagnosis

Gastro esophageal reflux disease was diagnosed by the clinical history, symptomatology and optional blood test for H. pylori antigen.

Inclusion criteria

The cases suffering from only chronic gastro esophageal reflux disease were selected on the following lines.

Patients between age group of 15 to 55 years.

Patients living in Burewala and Karachi and surrounding areas, Pakistan.

All socio-economical classes including lower, middle and upper.

Exclusion criteria

The cases suffering from acute diarrhea, vomiting, and food poisoning

Patients with concurrent physical illness for example uncontrolled hypertension and diabetes

Bleeding disorders, renal impairment, hepatitis and any other CNS disorder

STATISTICAL ANALYSIS

All the collected data were entered into different software and processed to find out the results as follows.

Spss version 18.0

Each follow up summary reports, including the entered data, was recorded electronically. Data was analyzed by using statistical analysis software spss, version 18.0. The proportion of patients who were treated successfully and compared between the two groups with using chi-square tests to analyze the change in improvement measurements over time. Differences between group in improvement measurements at the beginning and at the end of the study were assessed by analysis of variance that is of the sign and symptoms.

Ethical issues

Clearance and permission from ethical committee were obtained whenever needed considering the following points;

Selected, participating patients of the study were informed interviewed and examined

Identity was not revealed and the data were kept strictly confidential.

Copy of the entire data was made available to the relevant authorities. The protocol of clinical trial was approved by the committee.

Study of medication

The test group-1

There were two drugs included in the test group, test group-1 was administered herbal coded drug *Pepsil*, a powdered form of different herbs.

Formulation of Pepsil

The herbal coded drug *Pepsil* for test group-1 was a compound of the herbs, included in the formulation considering the available scientific data about the herbs from monographs of unani medicine, herbal pharmacopeias and research papers. The best possible dosage form of the drug for the study was 2g of powder which was prescribed after different physical confirmatory tests. The drug contains *Phyllanthus maderaspatensis., Argyreia nervosa* (Burm. F.), *Astragalus gummifer* labill, *Plantago psyllium and Coriandrum sativum*.

The test group-2

Safoof-e-*katira* another unani herbal medicine for gastric problems was used as a comparative drug for the study and the dose was 2g twice a day for the test group-2. The drug contains *Argyria nervosa, Plantago psyllium* and G*um tragacanth.*

Medication for control group

Omeprazole 20 mg, a known allopathic drug was administered as a control drug for the control group. It is a most common salt used for the treatment of the gastric problems. *Omeprazole* 20mg is in usual practice of the physicians and available under the different trade names in the market.

RESULTS

This was multicentre randomized case control study conducted at Matab Hakeem Muhammad Nooruddin, Burewala, Aziz Muhammad Din Medical and Surgical Centre, Burewala and Shifa-ul-Mulk Memorial Hospital, Hamdard University, Karachi. The patients were selected according to inclusion and exclusion criteria. Only those patients were enrolled who comply the study protocol and willing to include in clinical trial study. After taking written consent from patients they were prescribed test medicine and control to selected patients and all the history was recorded on prescribed data sheet or clinical trial proforma. All the patients were carefully screened and questionnaire was filled under the supervision of attending physician and research supervisor. At every follow up visit all the patients were asked about complaints and level of improvements after using the prescribed medicine and all the data was maintained on history sheet. There were two test drugs in this study and these were *Pepsil* and *Safoof*-e-*Katira*. At the end only fifty patients in test drug-1 *Pepsil* and fifty patients in test drug-2 *Safoof-e-Katira* completed the treatment duration and others were dropped out from study. Same in the case of control drug only 50 patients were completed the study and data was maintained and analyzed. The time duration of clinical trials was from January 2011 to January 2013 after completing the clinical trials all the data was analyzed by using Microsoft Excel 2007 and SPSS version 18.0.

Sex distribution

Sex distribution of patients treated with test drug-1, *Pepsil* was given in table-3, test drug-2, *Safoof-e-katira* in table-

4 and control drug, *Omeprazole* in table-5. The numbers of the male and female subjects were elaborated precisely.

Overall analysis

Overall results of individual group are given in table 5-7 by using paired sample t-test and level of significance of all the symptoms is calculated. Generally all the prescribed medicines has shown efficacy equal to each other. When we compare all these and their effects and patients complaints then *Pepsil* group have shown better results because of no side effects.

A multicentre study conducted on approximately 1960 patients with the endoscopy confirmed reflux esophagitis were prescribes esOmeprazole or *Omeprazole* with specific dose for up to 8 weeks, the result found that these medicine have the potential to cure gastro esophageal reflux disease in 86 to 94 % of cases with significant p value ($p<0.05$) but there is also complaints of these symptoms (headache, abdominal pain and the diarrhea) aggravated by using these medicine but present study has shown 90-99% results with significant p value and have not reported any of the adverse effects as produced by *Omeprazole* and even Safoof-e-*Katira* (Kahrilas *et al.*, 2000). Another study conducted in Norway on 483 untreated patients with complaints of heartburn for more than 3 days a week, by using *Omeprazole* 71% of patients had shown adequate control of heartburn and relief of nonreflux symptoms did not significantly differ between the three groups. It was concluded that *Omeprazole* was highly effective in relieving heartburn but when we compare with *Pepsil*, it has also shown similar efficacy with no side effects (Hatlebakk *et al.*, 1999). In the light of literature citations the natural therapies for GERD as described earlier, the assessment and management corroborate with our studies and support that Safoof-e-Katira could be utilized in an effective manner for GERD management.

DISCUSSION

Tolman *et al* very clearly described that proton pump inhibitors represent a class of antisecretory compounds, the substituted benimidazoles, that are devoid of anticholinergic or histamine H2 receptor antagonist proprties, but suppress gastric acid secretion by specific inhibition of the (H+,K+)-ATPase enzyme system at the secretory surface of gastric parietal cells. The proton pump inhibitors have emerged as a therapeutic alternative to H2-antagonists for the treatment of gastric disorders, including gastric esophageal reflux disease (GERD) [Tolman KG *et al*., 2000]. Whereas Azumi and co-workers have cited that Omeprazole and related proton pump inhibitors (lansoprazole, pantoprazole, and rabeprazole) all share a benzimidazole framework, and are considered pro-drugs, since they are stable at neutral pH but rearrange in the presence of acid to form tetracyclic sulphenamides, which covalently inhibit the enzyme (Azuumi and K. Saigenji, 1991).

The Canadian Optimal Medication Prescribing and Utilization Service delineate the equivalent initial doses of the PPIs that should give similar results in a majority of patients. Variations in hepatic metabolism of these drugs in individual patients may occasionally lead to increased benefits of one over another [Schwab M *et al*., 2005] .These are listed with dosage as Omeprazole 20 mg, rabeprazole 20 mg, pantoprazole 40 mg, lansoprazole 30 mg, esOmeprazole 20 mg. Therefore GERD is the most prevalent acid-related disorder and that it due to dysfunction of the lower esophageal sphincter. Clinical manifestations usually involve the feeling of heartburn, but the increasing recognition of non-esophageal symptoms manifesting as upper airway problems needs to be considered. Over the counter medications have been shown to provide symptom relief for patients with infrequent episodes, but PPIs provide the optimal benefit for patients with frequent and/ or severe symptoms or proven esophagitis. Proper follow-up of patients to assure maximal benefit, and appropriate duration, of use of these drugs is highly recommended.

Literature citation is available where natural therapies and lifestyle interventions are important to consider, owing to the chronic nature of GERD. Natural approaches to gastroesophageal reflux disease treatment for GERD symptoms. Evidence suggests that administration of atropine decreases transient relaxation in the LES and significantly decreases the number of reflux episodes [Lidums I *et al.*, 1998]. However, atropine can only be administered short-term, via intramuscular injections or intravenously. Lifestyle modifications can have a great impact on GERD symptoms. Diet recommendations include avoiding foods that trigger symptoms. Common culprits include acidic foods, such as tomatoes, coffee, tea, and citrus foods. Additionally, avoidance of foods that decrease LES pressure, such as high-fat foods, chocolate, peppermint, and alcohol, may be necessary. Alternative treatment for treating GERD have been addressed with Vitamin C, Melatonin, Fish oil, D-limonene, Glycyrrhiza glabra (licorice), digestive enzymes, Atropa belladonna (belladonna), Calcium and Magnesium.

Further antioxidants have been shown to be protective in numerous diseases, such as GERD, A study was performed with an antioxidant dietary supplement containing melatonin, Ltryptophan, vitamin B6, folic acid, vitamin B12, methionine, and betaine. The supplement or Omeprazole was given to individuals with GERD. In this study, 100% of individuals who took the supplement had complete regression of their GERD symptoms within 40 days compared with less than 66% of individuals who had regression of symptoms treated with Omeprazole. D-limonene is a monoterpene in citrus oil. Numerous studies

have shown that D-limonene where in practitioners often recommend D-limonene for treatment of GERD with generally good results. *Glycyrrhiza glabra* (licorice) root has historically been used as a demulcent and anti-inflammatory botanical for treating conditions such as gastric and duodenal ulcers. The DGL may provide symptom relief in patients with GERD. Clinically, alternative health care providers often prescribe additional demulcent herbs for their healing and soothing properties, including such herbs as Aloe vera (aloe), *Ulmus fulva* (slippery elm), and *Althaea officinalis* (marshmallow). *Pistacia lentiscus* (mastic) resin is used medicinally for treating duodenal and gastric ulcers but has been utilized [Al-Habbal MJ *et al*., 1984]. The antisecretory and cytoprotective activity of mastic may provide benefit for individuals with GERD. Atropa belladonna (belladonna) is a botanical often used for its anticholinergic activity. One of the constituents of belladonna is atropine and atropine has been shown to be beneficial. It is possible that belladonna may be useful for treating GERD owing to the herb's atropine component.

CONCLUSION

It is concluded that *Pepsil* herbal coded medicine has shown superior efficacy as compared to *Omeprazole* and *Safoof-e-Katira* because it has not shown any side effects and it is tolerable for all the patients.

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