

The Role of Some Medicinal Plants in the Management of Peptic Ulcer

*Faruk H. Al-Jawad M.B.Ch.B., Ph.D **Ahmed H. Ismael M.B.Ch.B., Ph.D
Anees K. Nile M.B.Ch.B., F.I.B.M.S. *Ahmed S. Sahib M.Sc., PhD

Abstract

Background: Plants used in folk medicine for the treatment of peptic ulcer diseases is a very promising approach to overcome the limitations of classical medicines.

Aim: To explore the efficacy of medicinal plants, namely turmeric, garlic and marshmallow, in eradication of *H. pylori*.

Methods: This prospective study was carried out on 225 of well-known dyspeptic patients who were divided into four groups; a control group (received classical medical therapy) and three other groups that received one of the three medicinal plants, plus the same therapy used in the control group. The follow up was done by using a questionnaire form, endoscopic examination, and determination of serum levels of anti *H.pylori* antibodies &

gastrin by using ELISA test. In addition, liver enzymes were monitored by using spectrophotometer to prove the safety of medicinal plants.

Results: The rate of recurrence of peptic ulcer disease was decreased in patients who received the combined therapy when compared to the patients in control group. Medicinal plants were effective in decreasing the recurrence of *H. pylori* infection when each one of them was used in combination with the medical therapy without causing harmful effects on the liver.

Conclusion: Turmeric, garlic & marshmallow are effective in management of peptic ulcer with low cost.

Keywords: peptic ulcer, *H. pylori*, turmeric, garlic, marshmallow.

Al – Kindy Col Med J 2011; Vol.7 No. 2 P: 51-58

Introduction:

Peptic ulcer disease (PUD) is a spectrum of diseases consisting of gastritis, gastric ulcers, and duodenal ulcers. It is known to occur when the endogenous defense mechanisms of the protective mucosal barrier have failed to sufficiently counteract the aggressive factors (hydrochloric acid, pepsin, and *Helicobacter pylori*) and is characterized by burning sensation in the abdomen. The available drugs for the management of PUDs are associated with high relapse rates and limiting side effects(1). Validation of the efficacy of medicinal plants used in folk medicine for the treatment of peptic ulcer diseases is a very promising approach to overcome the limitations of classical medicines (2).

The association between *H. pylori* and peptic ulcer disease is well-established and eradication is pivotal for ulcer healing and minimizing the relapse rate. Although

the eradication rate of currently used regimens ranges between 80% and 90%, the problem of developing resistance is emerging. A number of investigators have evaluated the effect of herbs and plant extracts on *H. pylori* (3).

The efficacy of eradication of *H. pylori*, the major causative factor of PUD was tested in three well-known medicinal plants, namely turmeric, garlic & marshmallow which were proved to be effective in treatment of ethanol induced gastric lesion by preliminary experiments on rats (4).

Methods:

This prospective study was carried out on 225 patients, from May 2006 to December 2007; and all of them were presented with symptoms of dyspepsia and heartburn. They were 162 males and 63 females with age ranging from 23 to 65 years, and they were chosen randomly out of the attendants of the gastroenterology

unit of Al-Kadhemia Teaching Hospital-Baghdad. Those patients have no other associated diseases. The protocol of this study was approved by ethical committee in the medical college, and patients were informed about administered medicinal plants. Patients were alienated into four groups; a control group (group A involved 66 patients) who were treated with the conventional medical management of *H. pylori* i.e. omeprazole, clarithromycin and amoxicillin, and three other groups that were received the same treatment used in control group plus a dose of 0.5 mg/kg/day of either of turmeric (group B involved 63 patients), garlic (group C involved 48 patients) or marshmallow (group D involved 48 patients). The course of treatment in each group was of two weeks (repeated once). Patients were followed up over nine months by using a questionnaire form to consider the predisposing factors of PUD, also by using endoscopic examination, determination of serum levels of anti *H.pylori* antibodies and gastrin using ELISA test, and also by measuring liver enzymes of those patients using spectrophotometer to detect any effect of the medicinal plants on the liver.

The follow up was done at five different periods of time at (zero time, after 2 weeks, 3 months, 6 months, & 9 months of treatment) to demonstrate the efficacy of the remedy and the recurrence of the disease. The collected data were analyzed statistically using Wilcoxon rank test at $P \leq 0.01$.

Results:

The following predisposing factors have been checked in the 225 patients sharing in this study, and the results are shown in table 1.

The effectiveness of the medicinal plants in the management of peptic ulcer was

evaluated by using the following parameters:

- Presence of medical symptoms of dyspepsia and heart burn- like sensation
- Endoscopic findings (presence or absence of peptic lesion)
- Serum level of Anti *H-pylori* antibody.
- Serum level of gastrin.

The above parameters have been monitored at five different periods: at zero time, after two weeks, three months, six months and nine months of treatments and the results are shown in tables 2 and 3.

Table 2 shows the frequency and percentage of PUD symptoms and endoscopic findings in patients of the four groups of this study monitored at five periods. In addition, table 3 shows the frequency and percentage of anti *H. pylori* antibodies and gastrin in patients' serum of the four groups of this study monitored at five periods.

Three liver enzymes (alkaline phosphatase ALP, alanine aminotransferase ALT, and aspartate aminotransferase AST) were measured by spectrophotometer and monitored at five different periods: at zero time, after two weeks, three months, six months and nine months of treatments and the results are shown in table 4.

Discussion:

The results in table 1 are concerned with the predisposing factors that reflect the fact that there is a correlation between the occurrence of PUD and its predisposing factors as it was suggested by international studies (5). The results in tables 2 and 3 are concerned with the parameters that were used to evaluate the effectiveness of medicinal plants in management of PUD. After two weeks and three months of treatment, the results

in the four groups of patients are correlated to the facts that the combination therapy of *H. pylori* infection produces a healing rate ranging from 80 to 95% (6). After six and nine months of treatment, the results of the four groups can be explained by the fact that the recurrence of PUD is anticipated in high percentage after the treatment of *H. pylori* infection and the prevention of recurrence or complications depends on continuous treatment with gastric acid antisecretory drugs (7). By comparing the results of control group and those of turmeric group table 2 & 3, we conclude that addition of turmeric to the conventional therapy of *H. pylori* was effective in the eradication of this bacterium and it reduces the recurrence of PUD (8). A comparison can be made between the results of turmeric and those related to garlic and marshmallow, and we can confirm that turmeric is the most potent amongst the three herbs in the treatment of peptic ulcer and reducing its recurrence due to its antimicrobial and anti-inflammatory effects (9). By comparing the results of garlic and those related to turmeric and marshmallow, we can conclude that garlic is more potent than marshmallow but not more than turmeric. Garlic is well known for its antimicrobial, anti-inflammatory, and antioxidant effects that can be the reason behind its ability to heal peptic ulcer and prevent recurrence of the disease (10). Part of the crucial role of garlic in the management of PUD and decreasing its recurrence can be explained by the synergistic effect in combination with omeprazole (11). Finally, we can see that marshmallow has less potency than the other two herbs to treat PUD. Although it can heal peptic ulcer as well as the other two plants, marshmallow needs more time to initiate its antiulcer action, which explains the improvement in healing rate six months after the treatment (12).

Hepatic safety of medicinal plants

A comparative study of the liver enzymes (alkaline phosphatase, alanine aminotransferase, and aspartate aminotransferase) was done in the four groups of patients to prove that over the period of follow up (nine months), there was no change in the serum levels of three liver enzymes in the patients involved in the study. This correlates with the fact that those plants are safe to be used in human (13) (14).

Conclusion:

Turmeric, garlic and marshmallow were effective in decreasing the recurrence of *H. pylori* infection when each of them was used in combination with the medical therapy without causing harmful effects on the liver.

Acknowledgment: We would like to express our gratitude to **Dr. Tarik M. Al-Hadithi, & Dr. Fadhil A. Al-Abboudi** (in gastroenterology unit), for their great help and advice.

References

1. Valle DL. Peptic ulcer diseases and related disorders. In: Braunwald E, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL, editors. Harrison's principles of internal medicine. 16th ed. New York: McGraw-Hill; 2005. p. 1746-62.
2. Koehn FE, Carter GT. The evolving role of natural products in drug discovery. *Nature Rev Drug Disc* 2005; 4:206-20.
3. Ibrahim Abdulkarim Al Mofleh I A. Spices, herbal xenobiotics and the stomach: Friends or foes? *World J Gastroenterol* 2010; 16(22): 2710-2719.
4. Al-Jawad FH, Al-Ani S. Effect of lansoprazole and some medicinal plants

- on ethanol induced gastric lesion in rats. *Journal of medical sciences* (in press).
5. Palmer KR, Penman ID, Paterson Brown S. Alimentary tract and pancreatic disease. In: Haslett C, Chilvers ER, Boon NA and C NR eds. *Davidson's Principles and practice of Medicine*. 19th ed. Churchill Livingstone. London. 2002; 740-830.
 6. Mahady GB, Pendland SL, Stoia A, Hamill FA, Fabricant D, Dietz BM, Chadwick LR. In vitro susceptibility of *Helicobacter pylori* to botanical extracts used traditionally for the treatment of gastrointestinal disorders. *Phytother Res* 2005; 19: 988-991
 7. Misiewicz JJ, Pounder RE: Peptic ulceration. In: Weatherall DJ, Ledingham JGG, Warrell DA: *Oxford Textbook of Medicine*. Oxford University Press and Electronic publishing B.V. CD-ROM 1996.
 8. Mahady GB, Pendland SL, Yun G, Lu ZZ. Turmeric (*Curcuma longa*) and curcumin inhibit the growth of *Helicobacter pylori*, a group 1 carcinogen. *Anticancer Res* 2002; 22: 4179-4181.
 9. Kositchaiwat C, Kositchaiwat S, Havanondha J. *Curcuma longa* Linn. In the treatment of gastric ulcer comparison to liquid antacid: a controlled clinical trial. *J Med Assoc Thai* 1993; 76(11):601-605.
 10. Cellini L, Di Campi, E, Masulli M, Di Bartolomeo S, Allocati N. Inhibition of *Helicobacter pylori* by garlic extract (*Allium sativum*). *FEMS Immunology and Medical Microbiology*. 1996; 13,273 -7.
 11. Jonkers D, van den Broek E, van Dooren I, Thijs C, Dorant E, Hageman G, Stobberingh E. Antibacterial effect of garlic and omeprazole on *Helicobacter pylori*. *Journal of Antimicrobial Chemotherapy*. 1999; 43, 837-839.
 12. Franz G. Polysaccharides in pharmacy. Current applications and future concepts. *Planta Med*. 1989; 55:493-497.
 13. *British Herbal Pharmacopoeia*: 4th ed. Great Britain: Biddles Ltd. Guildford and King's Lynn. 1996; 151-152.
 14. Gruenwald J, Brendler T, Jaenicke C: *PDR for Herbal Medicines*. Montvale, NJ: Medical Economics Co. 2002; 505-6, 786-8, 940-1.

Table 1: The predisposing factors of PUD as were seen in the patients of this study.

Predisposing factors		Frequency	Percentage %
Sex	Male	162	72.0%
	Female	63	28.0%
NSAID medication	NSAID positive	45	20.0%
	NSAID negative	180	80.0%
Smoking habit	Smoker	72	32.0%
	Non smoker	153	68.0%
Alcohol consumption	alcoholic	36	16.0%
	Non alcoholic	189	84.0%
Family history	Positive	144	64.0%
	Negative	81	36.0%
Anti- <i>H. pylori</i> antibody	Positive	209	92.89.0%
	Negative	16	7.11%
Type of ulcer	Gastric	72	32.0%
	Duodenal	153	68.0%
Blood group	Blood group A	27	12.0%
	Blood group B	54	24.0%
	Blood group AB	27	12.0%
	Blood group O	117	52.0%

Table 2: The frequency and percentage of PUD symptoms and endoscopic findings in patients of the four groups of this study monitored at five periods of time.

Parameters		Symptomatology				Endoscopic finding			
		Absent		Present		Absent		Present	
		Frequency	percentage %	Frequency	percentage %	Frequency	percentage %	Frequency	percentage %
Group (A)	zero time	0	.0%	66	100.0%	0	0%	66	100.0%
	2 weeks	46	69.7%	20	30.3%	45	68.2%	21	31.8%
	3 months	59	89.4%	7	10.6%	56	84.8%	10	15.2%
	6 months	27	40.9%	39	59.1%	28	42.4%	38	57.6%
	9 months	13	19.7%	53	80.3%	16	24.2%	50	75.8%
Group (B)	zero time	0	.0%	63	100.0%	0	.0%	63	100.0%
	2 weeks	45	71.4%	18	28.6%	44	69.8%	19	30.2%
	3 months	60	95.2%	3	4.8%	59	93.7%	4	6.3%
	6 months	42	66.7%	21	33.3%	40	63.5%	23	36.5%
	9 months	36	57.1%	27	42.9%	35	55.6%	28	44.4%
Group (C)	zero time	0	0%	48	100.0%	0	.0%	48	100.0%
	2 weeks	34	70.8%	14	29.2%	34	70.8%	14	29.2%
	3 months	43	89.6%	5	10.4%	41	85.4%	7	14.6%
	6 months	27	56.3%	21	43.8%	28	58.3%	20	41.7%
	9 months	24	50.0%	24	50.0%	26	54.2%	22	45.8%
Group (D)	zero time	0	0%	48	100.0%	0	.0%	48	100.0%
	2 weeks	34	70.8%	14	29.2%	34	70.8%	14	29.2%
	3 months	41	85.4%	7	14.6%	40	83.3%	8	16.7%
	6 months	27	56.3%	21	43.8%	27	56.3%	21	43.8%
	9 months	24	50.0%	24	50.0%	24	50.0%	24	50.0%

- Comparisons were done by Wilcoxon rank test between zero time and other periods (2 weeks, 3 months, 6 months and 9 months).
- Significant at $P \leq 0.01$
- Group (A) is control group; Group (B) is turmeric group; Group (C) is garlic group & Group (D) is marshmallow group.

Table 3: The frequency and percentage of anti *H. pylori* antibodies and gastrin level in serum of patients of the four groups of this study monitored at five periods of time.

Parameters		Anti- <i>H. pylori</i> antibody				Serum gastrin			
		Positive		Negative		Positive		Negative	
		Frequency	percentage %	Frequency	percentage %	Frequency	percentage %	Frequency	percentage %
Group (A)	zero time	5	7.6%	61	92.4%	0	.0%	66	100.0%
	2 weeks	50	75.8%	16	24.2%	46	69.7%	20	30.3%
	3 months	57	86.4%	9	13.6%	56	84.8%	10	15.2%
	6 months	23	34.8%	43	65.2%	28	42.4%	38	57.6%
	9 months	9	13.6%	57	86.4%	15	22.7%	51	77.3%
Group (B)	zero time	6	9.5%	57	90.5%	0	.0%	63	100.0%
	2 weeks	40	63.5%	23	36.5%	47	74.6%	16	25.4%
	3 months	47	74.6%	16	25.4%	55	87.3%	8	12.7%
	6 months	40	63.5%	23	36.5%	34	54.0%	29	46.0%
	9 months	35	55.6%	28	44.4%	23	36.5%	40	63.5%
Group (C)	zero time	4	8.3%	44	91.7%	0	.0%	48	100.0%
	2 weeks	30	62.5%	18	37.5%	34	70.8%	14	29.2%
	3 months	35	72.9%	13	27.1%	40	83.3%	8	16.7%
	6 months	28	58.3%	20	41.7%	26	54.2%	22	45.8%
	9 months	26	54.2%	22	45.8%	23	47.9%	25	52.1%
Group (D)	zero time	3	6.3%	45	93.8%	0	.0%	48	100.0%
	2 weeks	31	64.6%	17	35.4%	35	72.9%	13	27.1%
	3 months	36	75.0%	12	25.0%	40	83.3%	8	16.7%
	6 months	27	56.3%	21	43.8%	25	52.1%	23	47.9%
	9 months	26	54.2%	22	45.8%	22	45.8%	26	54.2%

Regarding the anti *H. pylori* antibodies, the result is said to be negative when the titer is less than 34 and positive when the titer is more than 42 and borderline when the titer is 34 – 42 (cut-off ~ 38.)

-Regarding the serum gastrin, the result is said to be negative when the titer is less than 1pmol/L and positive when the titer is more than 5pmol/L (cut-off ~ 3 pmol/L.)

-Comparisons were done by Wilcoxon rank test between zero time and other periods (2 weeks, 3 months, 6 months and 9 months -.(Significant at $P \leq 0.01$)

- Group (A) is control group; Group (B) is turmeric group; Group (C) is garlic group & Group (D) is marshmallow group.

Table4: the mean and the standard error of mean of the serum levels of Alkaline Phosphatase, Alanine aminotransferase and Aspartate aminotransferase in the patients of the four groups of the study.

Liver enzyme		Alkaline Phosphatase (IU/L)		Alanine aminotransferase (IU/L)		Aspartate aminotransferase (IU/L)	
Parameters		Mean	Standard Error of Mean	Mean	Standard Error of Mean	Mean	Standard Error of Mean
Group (A)	zero time	82.10	6.70	28.10	3.02	23.10	2.85
	2 weeks	83.00	7.07	28.70	3.44	25.00	3.14
	3 months	85.00	7.32	29.40	3.27	26.00	3.07
	6 months	84.00	6.94	31.10	3.40	26.00	2.26
	9 months	81.70	6.49	31.40	3.20	24.90	2.62
Group (B)	zero time	83.20	7.04	30.30	3.50	25.40	2.86
	2 weeks	85.20	7.32	32.10	3.35	26.00	2.26
	3 months	84.00	6.99	28.80	3.36	25.00	2.63
	6 months	81.90	6.43	29.00	3.00	25.10	3.19
	9 months	81.30	6.70	30.50	3.31	25.70	2.85
Group (C)	zero time	81.80	6.54	31.60	3.11	26.00	3.07
	2 weeks	85.40	7.06	28.40	3.09	25.40	3.37
	3 months	82.30	6.66	29.70	3.36	23.90	2.97
	6 months	83.10	7.15	29.70	3.13	24.10	2.66
	9 months	84.00	6.94	30.30	3.77	26.00	2.26
Group (D)	zero time	84.00	6.94	30.30	3.23	24.30	2.58
	2 weeks	82.40	7.18	30.40	3.72	23.70	2.84
	3 months	82.90	7.06	31.60	3.11	26.00	3.07
	6 months	84.90	7.35	28.10	3.02	26.00	2.26
	9 months	81.50	6.67	29.30	2.95	25.00	3.14

- Comparisons were done by Wilcoxon rank test between zero time and other periods (2 weeks, 3 months, 6 months and 9 months).

- Significant at $P \leq 0.01$

- Group (A) is control group; Group (B) is turmeric group; Group (C) is garlic group & Group (D) is marshmallow group.

Al – Kindy Col Med J 2011; Vol. 7 No. 2 P: 58

*From the Department of Pharmacology, Therapeutics College of medicine Al Nahrain University;

Correspondence Address to :Dr. Faruk H. Al-Jawad

Recived at : 10th March 2010 Accepted at : 14th sep2010