



A COMPARATIVE STUDY ON THE MEDICATION ADHERENCE AND ADVERSE EFFECTS OF STANDARD TRIPLE THERAPY AND CONCOMITANT THERAPY FOR *HELICOBACTER PYLORI* ERADICATION

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ABSTRACT

Helicobacter pylori is a gram-negative bacterium found on the luminal surface of the gastric epithelium that induces chronic inflammation of the underlying mucosa. The first-line choice of treatment for *H. pylori* infection was standard triple therapy for 7-14 days. Over the past few years, the efficacy of standard triple therapy has decreased, with eradication rates of <80%. Instead of conventional triple therapy, concomitant therapy can be used. The objective of the study was to compare medication adherence and adverse effects of standard triple therapy for 14 days and concomitant therapy for 10 days and to estimate the symptomatic relief in patients receiving these therapies. Patients who have satisfied the inclusion and exclusion criteria were enrolled for the study. Patients were divided into two groups, one group receiving the concomitant therapy and other under Standard triple therapy. Patient demographic details, medication adherence details, adverse effects and symptom severities were collected in a data collection proforma. There was no significant difference between the two groups regarding their medication adherence ($p=0.942$) and ADR. There was a significant improvement in the symptoms after completion of treatment ($p<0.01$) for both groups. This study was able to find the adherence and adverse effects of standard triple therapy and concomitant therapy for *H. pylori* eradication. Majority of patients shown good adherence to therapy but a number of patients were not getting maximum benefit due to the non adherence.

KEYWORDS: Adverse effects, Concomitant therapy, *Helicobacter Pylori*, Medication Adherence, Standard triple therapy.

INTRODUCTION

Helicobacter Pylori is the most prevalent bacterial infection in humans occurring in half the world population and about 30-40% of the US population. In India, sero surveys indicated a sero prevalence of 22-57% of children under the age of five, increasing to 80-90% by the age of 20 and remaining constant thereafter.^[51,52]

This study mainly focused to compare the medication adherence and adverse effects of Standard triple therapy and Concomitant therapy and also to estimate the symptomatic relief in patients after receiving the treatment. The Standard triple therapy consist a proton pump inhibitor (PPI: 20mg-40mg) together with the antibiotics clarithromycin (500mg) and amoxicillin(1000mg) twice daily for 7-14 days and Concomitant therapy consist of a proton pump inhibitor (20-40mg), amoxicillin (750mg), clarithromycin (500mg) and tinidazole 500mg for 10 days.

Treatment failure may occur due to antibiotic resistance to *H. pylori*, duration of treatment, new drug combination, side effects of the drug and most importantly non-adherence to the medication. Medication adherence is defined by the World Health Organization (WHO) as “degree to which the person’s behavior corresponds with the agreed recommendations from a health care provider”.^[65] The optimum eradication rates of *H. pylori* infection can be achieved if adherence to drug therapy is higher. Poor compliance will reduce the cure rate. Therefore, it is very important to determine the factors that lead to poor adherence to obtain successful treatment outcomes.

Side effects of the medication are major reason for non adherence and further treatment failure. The currently recommended antibiotic regimen for *H. pylori* eradication is well tolerable but some patients are not. Like any drug, antibiotic side effects may occur and interfere with the patient’s ability to tolerate and finish the course of medication. Most common side effects of

antibiotic affects digestive system and these occur in around 1 in 10 people. The common side effects of these therapies include bitter taste, general weakness, vomiting, nausea, constipation, diarrhea, headache etc.

Most *H. Pylori* infections are "silent" and cause no symptoms. When the bacteria do cause symptoms, they are usually either symptoms of gastritis or peptic ulcer disease. Chronic *H. pylori* infection causes several complications, so it should be treated as early as possible. Since non adherence to the medication is a key factor that causes treatment failure, there is a need to explore the ways to improve patient's adherence and also to give awareness about the side effects of the treatment for better clinical outcome. The opportunity to improve compliance exists at every point of contact between the patient and the medical service. As a pharmacist, better pharmaceutical care can be provided to the patient through this study. The study was carried out in the Department of Medical Gastroenterology, Govt. Medical College Hospital, Thiruvananthapuram, a tertiary care Teaching Hospital. This study aims to assess medication adherence and adverse effects of *H. pylori* treatment and also to assess symptomatic relief after the therapy. This study make an intervention to support the patient by improving their attitude towards the treatment, adherence to the medication and enhancing their knowledge about the therapy, which may helps to achieve goal of successful treatment.

METHODOLOGY

Primary objective

To compare the medication adherence and adverse effects of standard triple therapy for 14 days and concomitant therapy for 10 days.

Secondary objective

To estimate the symptomatic relief in patients receiving standard triple therapy and concomitant therapy.

Study design & Study setting: - Prospective observational study at the Dept. of Medical Gastroenterology, Govt. Medical College, Thiruvananthapuram.

Study Population & period: - All patients with chronic gastric problems who were under *H. pylori* treatment in the Govt. Medical College, Thiruvananthapuram for 6 months.

Procedure:- Patients who have satisfied the inclusion and exclusion criteria were enrolled for the study. Patients were divided into two groups, one group receiving the concomitant therapy and other under Standard triple therapy. Patient demographic details, medication adherence details, adverse effects and symptom severities were collected in a data collection proforma. Naranjo scale and Morisky medication adherence scale were used for investigating adverse effects and medication adherence respectively. Dyspeptic symptoms were assessed before and after the treatment using Global overall symptom (GOS) scale.

Data collected from the study was entered in Microsoft excel and data analysis was performed using SPSS version 17. Chi-square analysis was used for comparing two groups and Wilcoxon signed ranks test used to estimate symptom relief in subjects. A p value of 0.05 will be considered as level of significance.

RESULTS

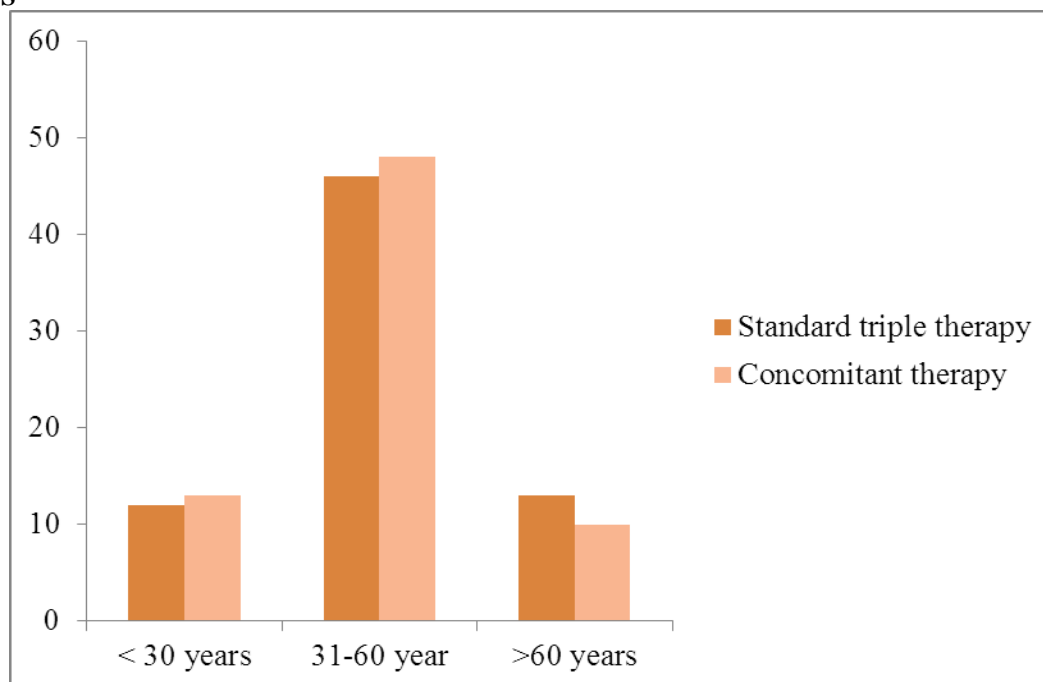


Figure 1: Distribution of study participants according to age.

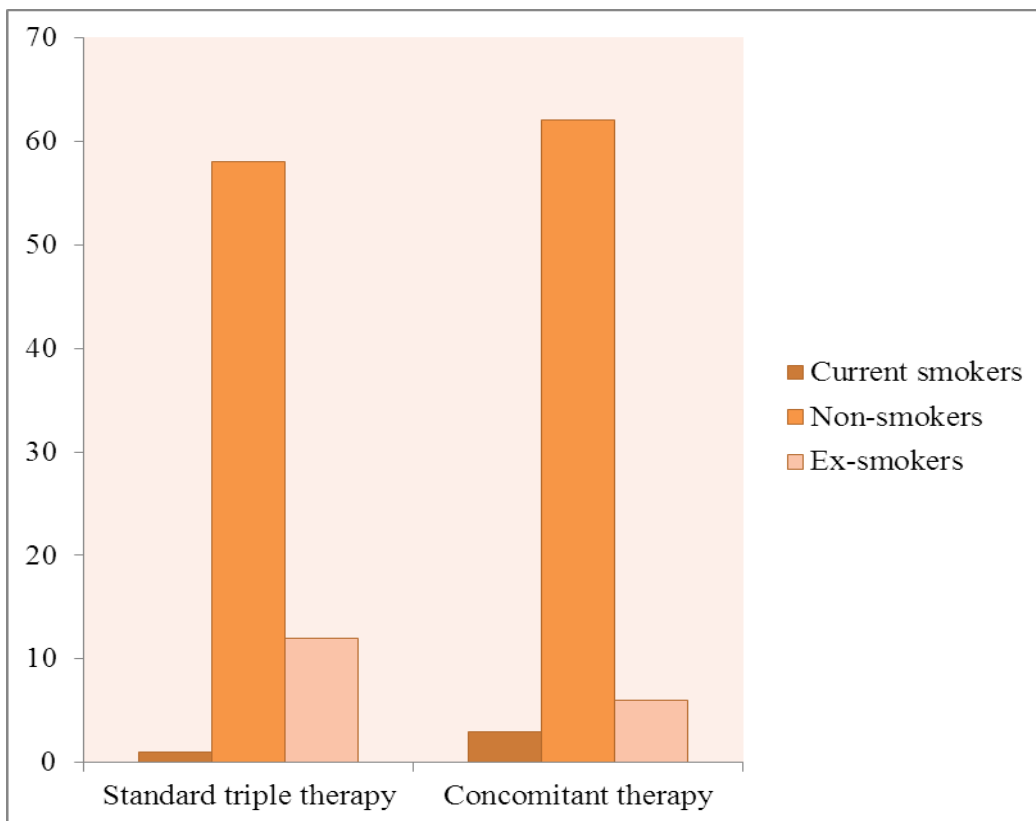


Figure 2: Distribution of study participants according to smoking.

Table 1: Distribution of study subjects according to diagnosis.

Diagnosis	Standard therapy		Concomitant therapy	
	Number	Percentage	Number	Percentage
Peptic ulcer	11	15.5	2	2.8
GERD	2	2.8	4	5.6
Chronic deodenitis	0	0	1	1.4
Chronic gastritis	37	52.1	46	64.8
Antral gastritis	13	18.3	17	23.9
Mild gastritis	7	9.9	1	1.4
CLD	1	1.4	0	0
Total	71	100.0	71	100.0

Table 2: Distribution of study participants according to medication adherence.

Drug therapy	High adherence N (%)	Medium adherence N (%)	Low adherence N (%)	Total N (%)
Standard triple therapy	54(76.1)	4(5.6)	13(18.3)	71(100)
Concomitant therapy	53(74.6)	5(7)	13(18.3)	71(100)

Table 3: Reason for non-adherence to therapies.

Reason for non adherence	Standard triple therapy		Concomitant therapy	
	Number	Percentage	Number	Percentage
Forget to take medicine	6	8.5	2	2.9
Inconvenient dosage timing	3	4.2	4	5.7
Side effects	5	7	5	7.1
Cost of drug	2	2.8	2	2.9
Treatment seems to be ineffective	1	1.4	1	1.4
Unavailability	0	0	2	2.9

Table 4: Relationship between subject demographics and medication adherence.

Patient characteristics and demographics		Adherence			P value
		High N (%)	Medium N (%)	Low N (%)	
Sex	Male	55(77.5%)	3(4.2%)	13(18.3%)	0.582
	Female	52(73.2%)	6 (8.5%)	13 (18.3%)	
Economic status	APL	51(75.5%)	5(7.4%)	12(17.6%)	0.884
	BPL	56 (75.7%)	4(5.4%)	14 (18.9%)	
Marital status	Married	94(76.4%)	7(5.7%)	22(17.9%)	0.658
	Single	13(68.4%)	2(10.5%)	4 (21.1%)	
Alcoholic	No	100(75.2%)	9(6.8%)	24 (18.0%)	0.706
	yes	7(77.8%)	0(0%)	2(22.2%)	
Smoking	Never smoked	91(75.8%)	8(6.7%)	21(17.5%)	0.283
	Ex- smoker	13(72.2%)	0(0%)	5(27.8%)	
	Current smoker	3(75.0%)	1(25.0%)	0(0%)	
Education status	Primary	39(76.5%)	4(7.8%)	8(15.7%)	0.526
	High school	39(70.9%)	4(7.3%)	12(21.8%)	
	Higher secondary	16(94.1%)	0(0%)	1(5.9%)	
	Degree	11(73.3%)	1 (6.7%)	3 (20.0%)	
Occupation	Post graduate	2(50%)	0(0%)	2(50%)	0.466
	Unemployed	56(76.7%)	6(8.2%)	11(15.1%)	
	Skilled	26(83.9%)	1(3.2%)	4(12.9%)	
	Unskilled	19(65.5%)	2(6.9%)	8(27.6%)	
Concomitant medical illness	Professional	6(66.7%)	0(0%)	3(33.3%)	0.140
	Nil	94(76.4%)	7(5.7%)	22(17.9%)	
	Hypertension	4(66.7%)	1(16.7%)	1(16.7%)	
	Diabetes Mellitus	3(100.0%)	0(0%)	0(0%)	
	Dermatological	1(100%)	0(0%)	0(0%)	
	Infectious	1(100%)	0(0%)	0(0%)	
	Cardiovascular	2(50%)	0(0%)	2(50%)	
	Hepatic	1(50%)	0(0%)	1(50%)	
Respiratory	1(50%)	0(0%)	0(0%)		
Psychiatry	0(0%)	1(100%)	0(0%)		

Table 5: Incidence of ADR in Standard triple therapy and concomitant therapy.

ADR	STANDARD TRIPLE THERAPY		CONCOMITANT THERAPY		P value
	N	%	N	%	
Bitter taste	49	69	48	67.6	0.857
Head ache	22	31.0	24	33.8	0.720
Loose stool	4	5.6	5	7	0.731
Dark stool	4	5.6	8	11.3	0.228
Vomiting	1	1.4	5	7	0.095
Fatigue	37	52.1	35	49.3	0.737
Diarrhoea	25	35.2	16	22.5	0.096
Abdominal pain/bloating	12	16.9	11	15.5	0.820
Dizziness	1	1.4	6	8.5	0.053
Constipation	9	12.7	6	8.5	0.413
Nausea	13	18.3	10	14.1	0.494
Sleeping tendency	0	0	2	2.8	0.154
Loss of appetite	0	0	2	2.8	0.154
Fever/chills	0	0	4	5.6	0.042
Shortness of breathe	1	1.4	1	1.4	1.000
Unusual bleeding	0	0	1	1.4	0.316
Cough	3	4.2	1	1.4	0.310
Dark urine	0	0	1	1.4	0.316
Insomnia	1	1.4	5	7	0.095
Confusion	0	0	1	1.4	0.316
Mouth ulcers	1	1.4	0	0	0.316
Itching	0	0	2	2.8	0.154

Table 6: Distribution of patients according to action taken against ADRs.

Action taken	Standard triple therapy		Concomitant therapy	
	Number	Percentage	Number	Percentage
None	69	98.6	65	92.9
Drug treatment required	0	0	1	1.4
Non drug treatment required	0	0	1	1.4
Hospitalization required	1	1.4	3	4.3
Total	70	100	70	100

Table 7: Causality of ADR (Naranjo algorithm).

Causality of ADR	Standard triple therapy	Concomitant therapy	Total
	Number (%)	Number (%)	Number (%)
Definite	0(0%)	0(0%)	0(0%)
Probable	147(82.6%)	156(80.4%)	303(81.5%)
Possible	30(16.9%)	36(18.6%)	66(17.7%)
Doubtful	1(0.6%)	2(1%)	3(0.8%)
Total	178	194	372

Table 8: Symptomatic relief in patients receiving *H.pylori* therapy.

Global symptom scale	Standard triple therapy (N=66)		P value	Concomitant therapy (N=63)		P value
	Before	After		Before	After	
Mean (SD)	25.20 (10.61)	16.23 (7.468)	<0.01*	25.16(10.41)	16.70 (7.50)	<0.01*
Median	25.0	14.0		25.50	14.0	
IQR	16-33	12- 17.25		16.25-32.75	11-21.75	
Minimum	10	10		10	10	
Maximum	64	54		49	36	

Table 9: Effect of probiotics on tolerance to *H.pylori* eradication therapy.

ADR	Probiotics				P
	Taken (N=52)		Not taken (N=90)		
	N	%	N	%	
Bitter taste	38	73.1	58	64.4	0.29
Head ache	20	38.5	26	28.9	0.24
Loose stool	3	5.8	6	6.7	0.833
Dark stool	7	13.5	5	5.6	0.103
Vomiting	5	9.6	1	1.1	0.015
General weakness	31	59.6	39	43.3	0.062
Diarrhoea	7	13.5	34	37.8	0.002
Abdominal pain/bloating	8	15.4	15	16.7	0.842
Dizziness	3	5.8	4	4.4	0.725
Constipation	5	9.6	10	11.1	0.78
Nausea	11	21.2	12	13.3	0.223
Sleeping tendency	2	3.8	0	0	0.061
Loss of appetite	1	1.9	1	1.1	0.692
Fever/chills	3	5.8	1	1.1	0.106
Shortness of breathe	1	1.9	1	1.1	0.692
Unusual bleeding	0	0	1	1.1	0.446
Cough	1	1.9	3	3.3	0.625
Dark urine	1	1.9	0	0	0.187
Insomnia	4	7.7	2	2.2	0.119
Confusion	1	1.9	0	0	0.187
Mouth ulcers	0	0	1	1.1	0.446
Itching	1	1.9	1	1.1	0.692

DISCUSSION PATIENT CHARACTERISTICS AND DEMOGRAPHICS

In this study, majority of individuals belonged to the age group of 31-60 in both standard therapy (64.8%) and concomitant therapy (67.6%) groups. Studies conducted by Menzies et al (1993) and Wai et al (2005) found that age is not a factor causing non-compliance to the treatment. In our study, significant association between age and adherence is not recognised. A study by Gunaid A. et al (2003) showed that *H. pylori* infection had a strong association with age of >40 years in Yemen.^[57] Another case control study by Tesfahun et al stated that there was no statistical significant association between *H. pylori* infection and sex and age.^[58]

The present study has shown that percentage of males and females were almost equal. There were no significant differences between the percentage of males and females in ST and CT group (52.1% and 47.9% males in ST and CT respectively; 47.9% and 52.1% females in ST and CT) also. But in similar studies conducted by Makaju R K et al and Yangchun Zhu et al indicates that males were more infected with *H. pylori* than females.^[59] Studies by Menzies et al and Buck et al (1997) can be correlated to our study that they could not find any relationship between gender and compliance and a study by Yun Mi Yu at South Korea (2015) stated that ADRs were found to occur more in females.^[60]

From this study, 49.3% patients in the ST group and 54.9% in the CT group come under poor economic status. Study indicates that no significant association exist between poor economic status and adherence ($p=0.884$). A study conducted by Moges et al on dyspeptic patients showed that there was no significant association with sex, socioeconomic status and seropositivity of *H. pylori*. But in our study four patients discontinued therapy due to their financial problems.

All the patients enrolled in the study were literate, since Kerala is highly literate state. 39.4% patients in the ST group and 38.0% in the CT group have high school education. Most of the patients come under this category. There were no significant association between adherence and educational status ($p=0.526$) in this study. In a similar study conducted by Shakya Shrestha et al in Nepal showed that most of the respondents were literate and high literacy rate might be the reason for good adherence.

Here, 87.3% in the ST group and 85.9% in the CT group were married. In a study by Swett et al 1989 and Cooper et al 2005 found that marital status might influence patient's compliance with medication positively. But Yavuz et al and Kaona et al in 2004 showed there is no relationship between marital status and medication adherence.^[60] In our study there is no significant relationship between this also.

From this study, 59.2% in ST group and 43.7% in CT group were unemployed. Boudes P et al 1998 showed that occupation has no much influence on the adherence to the therapies.

Patient related factors like alcoholism and smoking has not much influence on the *H. pylori* infection, medication adherence to therapies and adverse effects. As per this study 94.4% in the ST group and 93.0% patients in the CT group were non alcoholics. 81.7% in the ST group and 87.3% patients in the CT group had never smoked. Consequences of taking alcohol while on treatment are twofold. Firstly, patients taking alcohol may forget to take their medication and secondly that may increase side effects to medications. Brenner et al stated that alcohol consumption may have a protective effect against *H. pylori* infection. N J Talley et al reported that smoking and alcohol may not be an important risk factor for dyspepsia.^[66]

Study has shown that 84.5% in the ST group and 81.7% in the CT group were non-vegetarians. Ishita Laroyiya et al found that there is no significant association between non vegetarian diet and *H. pylori* infection.^[67] Ray et al failed to found an association between increased non vegetarian diet and gastric cancer.

According to BMI status, 57.7% patients in ST group and 62% in CT group comes under normal weight in this study. Jun Sik Choi et al reported that triple therapy induced weight gain has noted in *H. pylori* infected patients after completing therapy. Loffeld et al reported that eradication of *H. pylori* led to increased body weight.

Here from a total of 142 patients, only one patient in ST group was allergic to drugs (Paracetamol). None of the patients were allergic to antibiotics.

In this study, 90.1% patients among the ST group and 83.1% in the CT group don't have any concomitant illness and not taking any other medication. Other medications and concomitant illness have no influence on the medication adherence to the therapies in this study ($p=0.140$). Stress related factors may sometimes adversely affect patient compliance towards therapies. Subjects enrolled in this study have no serious illness. In a study by Patal and Taylor et al 2002 stated that compliance to therapy doesn't have any relation with the number of drugs patient taking.

From this study, it is seen that 52.1% in the ST group and 64.8% in the CT group were confirmed with chronic gastritis. Secondly, the main problem patients were suffering from was antral gastritis followed by peptic ulcer. In a similar study by AyseKefeli et al at Turkey, chronic gastritis was the major problem for the patients indicated for *H. pylori* eradication regimen.

MEDICATION ADHERENCE TO THERAPY

In this study, medication adherence was assessed for two therapy groups. 76.1% (n=54) of the ST group and 74.6% (n=53) of the CT group showed high adherence. 5.6% in ST and 7% in CT group have medium adherence and 18.3% of the both ST and CT showed poor compliance towards the therapy. Among the patients who have shown high adherence, 50.5% followed standard therapy and 49.5% were taking concomitant therapy. Chi square analysis demonstrated that there was no significant difference between the two groups regarding their medication adherence (p=0.942). In a similar study conducted by Muhammed et al (2013) showed that there is no significant association between eradication regimens and patient adherence and about 81% of them showed good adherence also.^[2] Similarly, Seung Young Kim et al (2013) stated that there was no significant difference in compliance of standard and concomitant therapy (p=0.37).

FACTORS RESPONSIBLE FOR NON-ADHERENCE

In the Standard therapy group, 8.5% patients showed non adherence due to forgetfulness followed by side effects of the drugs (7%), then inconvenient dosage timing (4.2%), cost of drug (2.8%) and 1 patient stopped medicine since treatment seems to be ineffective for them. In the case of Concomitant therapy group, the major reason for non adherence was side effects of the drug (7.1%) and then inconvenient dosage timing (5.7%). 2.9% patients showed non-adherence due to forgetfulness, cost of drug and unavailability of medicine each. There were no significant differences between the groups regarding their reason for non adherence. Out of 142 patients, the main reason for non adherence was side effects (n=10) and forgetfulness (n=8). In a similar study by Sakshya et al found that forgetfulness was the major reason for missing dose. Okuno et al 2001 and Wai et al 2005 suggest that forgetfulness is a widely reported factor that causes non compliance. But in other studies it stated that side effects of the medication were the major reason for non compliance (Kaplan et al 2004, Loffler et al 2001).

It seems that type of regimen is not a factor in determining adherence to therapy. Proper communication with the patient by health care providers helped to increase the adherence. Majority of patients followed the instructions given by physician and pharmacist.

ADVERSE DRUG REACTION MONITORING

A total of 142 patients were included in the study, out of which 127 patients experienced adverse drug reactions. ADR of the two groups were compared. We couldn't find a statistically significant difference between the two therapies regarding their ADR except fever (p=0.042). Mohammed et al (2012), AyseKefeli et al (2016) also stated that there was no statistically significant difference between the *H. pylori* regimens regarding their ADR¹.

5.6% patients in the CT group experienced fever while none of them in ST group. Fishbach L et al (2004) in a meta-analysis stated that the occurrence of adverse events was consistently similar for Triple and Quadruple therapies. Bitter taste was the most experienced ADR in both group (69% in ST and 67.6% in CT). Incidence of ADR was very high in this study compared to others. A total of 372 ADR experienced by 127 patients, majority of them were mild reactions. Non-gastrointestinal effects like head ache and fatigue were frequent among these patient groups. Gastrointestinal side effects like diarrhoea, vomiting, nausea, abdominal pain and constipation were also experienced by more number of patients. Byeong Gwan Kim et al (2007) showed that taste disturbance and diarrhoea were the commonly experienced ADR due to *H. pylori* eradication regimens. In this study, one patient in ST and three patients in CT got hospitalized due to vomiting. Five patients stopped medication due to side effects.

CAUSALTY OF ADRs

Among the reported ADRs, 82.6% of ST and 80.4% of CT were found to be probable. 16.9 in ST and 18.6% in CT was possible and 0.6% in ST and 1% in CT were doubtful ADRs.

ESTIMATION OF SYMPTOMATIC RELIEF IN PATIENTS RECEIVED *H.PYLORI* ERADICATION REGIMEN

Average global symptom score among the Standard therapy group before taking medication was 25.20 ± 10.61 and Concomitant therapy was 25.16 ± 10.41 and symptom score after completing treatment among Standard therapy group was 16.23 ± 7.468 and that of Concomitant therapy group was 16.70 ± 7.50 . Median symptom scores before and after standard therapy was found to be 25.0 and 14.0 respectively and in concomitant therapy group, it was 25.50 and 14.0. There was a significant improvement in the symptoms after treatment (p<0.01) for both groups. In other hands, difference between standard and concomitant group regarding the alleviation of symptoms is not significant. A study by Murat Sarikaya et al (2014) observed a significant symptom resolution at 12 months in *H.pylori* eradication regimen groups.^[16] But there was no significant difference between those groups regarding the alleviation of symptoms.

EFFECT OF PROBIOTICS ON THE TOLERANCE TO THERAPY

In both groups, some of the patients were prescribed with probiotics along with the eradication regimen. Commonly prescribed probiotics were Enzispur (Bacillus Clausi) and Yogurt capsules (Bifidobacterium bifida and Lactobacillus acidophilus). Myllulloma et al (2005) concluded that probiotic group showed less treatment related effects throughout the *H.pylori* eradication therapy (P=0.038). Another study by Matjaz et al (2015) showed that probiotics decrease the occurrence of side effects due to antibiotic therapy but don't eradicate

H.pylori completely in the mucosa if used as a monotherapy. In this study, patients who had taken probiotics shown a significant decrease in the incidence of diarrhoea and vomiting ($p<0.05$).

SUMMARY

Majority of patients were in the age group of 31-60 years. Number of males and females were equal in the present study. All patients were literate. Number of APL and BPL patients did not show any significant difference. Majority of the patients were married, unemployed, non-alcoholics, non-smokers and non-vegetarians. Majority of patients have no other concomitant medical illness and were not taking any other medications. Most of the patients were confirmed with chronic gastritis followed by antral gastritis.

Majority of patients have shown high adherence to the therapy in both groups. Adherence shown by both groups has no statistically significant difference. Main reason for non compliance is side effects of medication and forgetfulness. Incidence of adverse reaction is more in concomitant therapy group than standard triple therapy group, but is not statistically significant. Bitter taste, fatigue and headache are the most frequently reported ADRs. Symptomatic relief after completion of therapy was found to be statistically significant ($p<0.01$) for both groups. 13 patients excluded from assessing symptomatic relief, since they discontinued therapy for various reasons. Taking probiotics along with therapy has decreased incidence of diarrhoea and vomiting.

Adherence to therapy is an important factor in the success of treatment to eliminate *H.pylori*. Non adherence may leads to worsening of disease, resistance to antibiotics and increased health care costs. Pharmacist obviously plays a role in guiding each patient for increasing their compliance to therapy. Proper counseling given to the patients can enhance their knowledge about eradication regimen. Evaluating the reason for non adherence and their side effects among the patients were useful in improving their attitude towards the regimen which may leads to good health care outcome.

CONCLUSION

Helicobacter pylori infection is widespread all over the world especially in developing countries. Different types of regimens are there in practice for eradication of *H. pylori*. An optimum adherence to the therapy is very essential for the complete eradication of bacteria. This study was able to find the adherence and adverse effects of standard triple therapy and concomitant therapy for *H. pylori* eradication. A large number of patients were not getting maximum benefit due to the non adherence and it leads to poor health outcome and low quality of life. Adverse reactions associated with these therapies were found to be minor but was the major reason for non adherence. The present study helps to increase the

medication adherence among the patients through proper counseling.

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