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Original Research Article

Assessment of medication adherence in *Helicobacter pylori* positive patients on standard triple therapy: a prospective study

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ABSTRACT

Background: In the current study patient compliance to the standard triple therapy were assessed. The objective behind this research was to assess the patient medication adherence to the standard triple therapy in *Helicobacter pylori* infection.

Methods: A prospective study was carried out for a period of 1 year and samples were taken from the gastroenterology department. Patient who was RUT (rapid urease test) positive by endoscopy were considered as *H. pylori* infected and they were prescribed with standard triple therapy. This regimen involves amoxicillin 1000 mg and clarithromycin 500 mg and proton pump inhibitor (PPI) twice a day for 14 days. Adherence to this triple therapy was assessed during the study. Medication adherence assessed using Morisky, Green and Levine (MGL) adherence scale. MGL adherence questionnaire was given to patients during first week and second week of therapy. The patients will be counselled regarding the drug administration, drug related problems and the infection. They were also provided with written instructions in leaflets. 88 patients were analyzed.

Results: In this study, 84 patients had a good adherence 95.5%; but other 4.5% didn't fully comply with the physician's order. After the first week of standard triple therapy, adherence was increased to a mean score from 2.193±0.1301 to 3.5227±0.0704 in the second week. The medication adherence score significantly increased along with patient counselling.

Conclusions: Medication adherence was improved in the 14 days course along with patient education helped to comply with the standard triple therapy.

Keywords: *Helicobacter pylori*, Standard triple therapy, Rapid urease test, MGL adherence

INTRODUCTION

Helicobacter pylori is a gram negative, bacterium that selectively colonizes on the gastric epithelium of humans and responsible for gastric ulcers. In 1983, Marshall and Warren first identified *H. pylori*.¹ Infection with *H. pylori* is widespread and probably acquired mainly via the fecal-oral route. It can be affected from food, water, and

utensils. Infection may be asymptomatic or result in varying degrees of dyspepsia.²

H. pylori is associated with the development of chronic gastritis, peptic ulcer disease (PUD) and gastric cancer. Infection with *H. pylori* is common, about two-third of the world's population and the prevalence of infection is greatest in countries of the developing world.

India is the prototypical developing country the prevalence of *H. pylori* in Indian subcontinent is about 64-90% as far as *H. pylori* infection is concerned about 20million Indians are estimated to suffer from peptic ulcer disease. Southern and eastern parts of India have a higher frequency of gastric ulcer than that in northern parts.³

Prevalence of *H. pylori* infection in Kerala is high. Absolute prevention of complications and relief can be achieved through early detection by conventional and affordable diagnostic methods and empirical treatment with eradication regimen; even though the prevalence of *H. pylori* related gastritis and associated abdominal symptoms is high in number, serious gastrointestinal complications are rare.

PUD remains one of the most common gastrointestinal (GI) diseases, resulting in impaired quality of life, work loss, and high-cost medical care. To date, H₂-receptor antagonists (H₂RAs), proton pump inhibitors (PPIs), and drugs that promote mucosal defense have not altered PUD complication rates.

Helicobacter pylori infection has varying symptoms on different patients. The primary aim of any treatment is to assess the medication adherence and then to eradicate the infection. Infection can be treated with standard triple therapy regimen. In the present study, the goal was to evaluate medication adherence to the standard triple therapy regimen in patients with *H. pylori* infection.

Several studies have been conducted on symptomatic benefits from eradicating helicobacter pylori infection with standard triple therapy regimen and proton pump inhibitors (PPI) alone. Majority of these studies proved that treatment with antibiotics and proton pump inhibitors resolved symptoms more likely than proton pump inhibitors alone.³ The *Helicobacter pylori* eradication regimen includes amoxicillin 1000 mg, clarithromycin 500 mg and proton pump inhibitor 40 mg.⁴

To achieve the expected therapeutic outcomes, it is necessary for the patients to comply with the physician's advice and the medications prescribed to the patients must be taken at right doses at the right interval. Patient's medication adherence can be improved through effective patient counseling. We counseled the patients twice during the treatment course to obtain maximum medication adherence.

Patient compliance is an important factor for the successful outcome of the treatment regimen. Influence of patient counselling and follow-up helps in the successful eradication of *H. pylori*.⁵ The two common reasons for treatment failure are non-compliance and resistance. Non-compliance is affected by the frequency and severity of side effects. With proper patient instruction, this treatment regimen is well tolerated and very effective for the eradication of *H. pylori* strains.⁶

This study focusing on the assessment of medication adherence in *H. pylori* positive patients who were on standard triple therapy regimen and these patients also provided with proper counselling.

METHODS

The prospective study was carried out for a period of 6 month from December 2018 to May 2019. The samples were taken from the gastroenterology Department of Cosmopolitan Hospital, Trivandrum. A written informed consent was taken from the patients diagnosed as helicobacter pylori infection satisfying the inclusion and exclusion criteria.

Inclusion criteria

Inclusion criteria were patients on standard triple therapy for helicobacter pylori, patients of age 18-80 years and patients with positive rapid urease test (RUT).

Exclusion criteria

Exclusion criteria were patients with previous history of helicobacter pylori eradication, patients with hepatic and renal impairment, pregnant and lactating women, patients on prolonged proton pump inhibitors, antibiotics therapy, anticoagulants and nonsteroidal anti-inflammatory drugs (NSAIDs), and patients who have a history of allergy or hypersensitivity to any antibiotics in the regimen.

All information relevant for the study will be collected from case records and by directly interviewing the patients. This infection is confirmed on endoscopy with RUT (rapid urease test) positive. All relevant information regarding the study was collected from case records and direct interview with the patients or care takers.

Medication adherence will be assessed using the Morisky, Green and Levine (MGL) adherence scale. MGL adherence questionnaire will be given to patients during 1st week and 2nd week of therapy. The patients will be counselled regarding the drug administration and Helicobacter pylori infection. They will also be provided with written instructions in leaflets. The patients or care takers were then to be educated about the disease, medication, diet, and practicing hygiene.

Statistical analysis

For data entry we had used the software microsoft excel and all the analysis were carried out with the help of statistical software SPSS v22 version for windows. The improvement of symptoms was statistically assessed using paired t-test.

RESULTS

A total of 90 *H. pylori* positive patients were treated with standard triple therapy. They were diagnosed to have

RUT positive and it makes the criteria for enrolling in the study. Patients of age 18-80 were participate in the study. The reasons for exclusions were evidence of hepatic and renal impairment, history of allergy or hypersensitivity to any antibiotics in the regimen, previous treatment for *H. pylori*, prolonged use of PPI, antibiotics therapy, anticoagulants or NSAIDs. Two patients were unavailable for follow up hence they were excluded from the study and the remaining 88 were undergone the overall observation.

The medication adherence during and after the treatment were statistically assessed using paired t-test. A calculated p value less than 0.05 considered to be statistically significant.

Socio demographic details of patients

In this section data background characteristics of patients were collected, and frequencies and percentages were collected. The details are shown in following.

From Table 1, it is seen that the age group of patient ranges from 18-80 years and the patients were divided into 4 groups. Out of 88 patients 37.50% fall into the age group of 18-39 years and 42% belongs to the age group 40-59 years. Age group of 60-80 years consist of 20.4% of patients. The result shows that majority of patients were in the age group of 40-59 years.

Table 1: Frequency and percentage distribution based on age.

Age (in years)	Frequency	Percentage
18-39	33	37.5
40-59	37	42.0
60-80	18	20.4

Out of the 88 patients enrolled in the study gender distribution, the medication adherence was higher in males i.e., 50/88 (56.8%) compared to females i.e., 38/88 (43.2%) (Figure 1).

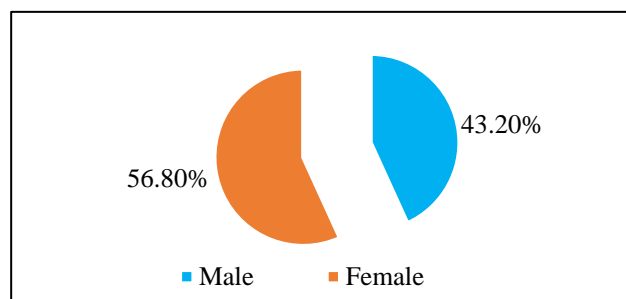


Figure 1: Distribution based on gender.

In medication adherence on first week zero scored by 5 (5.7%) patients out of the 88. Zero score indicating of low adherence and score one (25/88) and score of two (24/88) were considered to have medium adherence on

medication; those who provided with patient education. High adherence obtained at a score of three (18.2%, 16/88) and score of four (20.5%; 18/88).

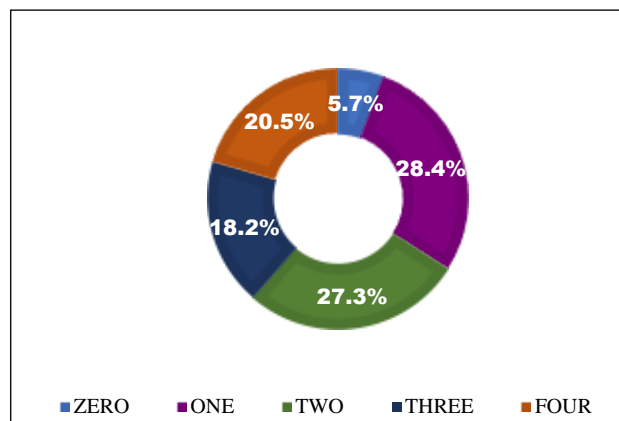


Figure 2: Distribution of medication adherence score in first week.

From (Figure 2) it is observed that compliance score is at low for 5 patients and 49 patients had medium adherence. These patients were counselled to have expectation of high adherence. 34 (38.7%) patients were highly adherent to the regimen.

52 (59.1%) patients reported to have adherence score of four and 32 (36.4%) had score of three; both are high adherent patients. 2 patients in each group of one and two (2.3%) with medium adherence (Figure 3).

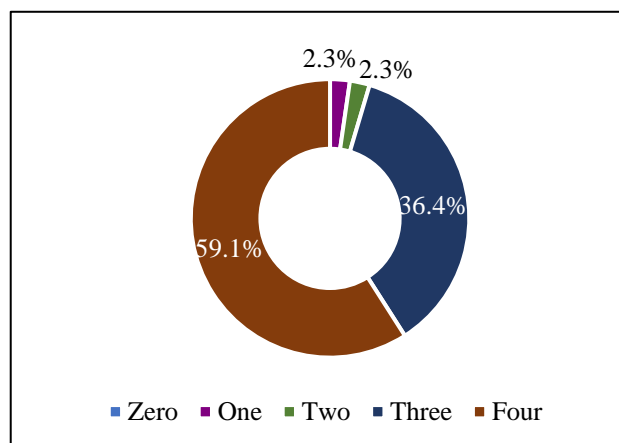


Figure 3: Distribution of medication adherence score in second week.

Out of 88 patients 84 (95.5%) had high adherence to medication regimen. There were no patients with low (zero score) adherence at the end of therapy.

Two patients were unavailable for follow up hence they were excluded from the study and the remaining 88 were considered. Among this, 50 (56.80%) were men. It was estimated that majority of these male patients consumed food from outside on a regular basis. Average of age 40-

59 were found, this might be of their socioeconomic status. In this study, 84 out of the 88 observed patients had a good adherence and is about 95.5%; but other patients 4.5% didn't, fully comply with the physician's order. The medication adherence after the first week and second week of eradication regimens have been demonstrated in (Figure 4).

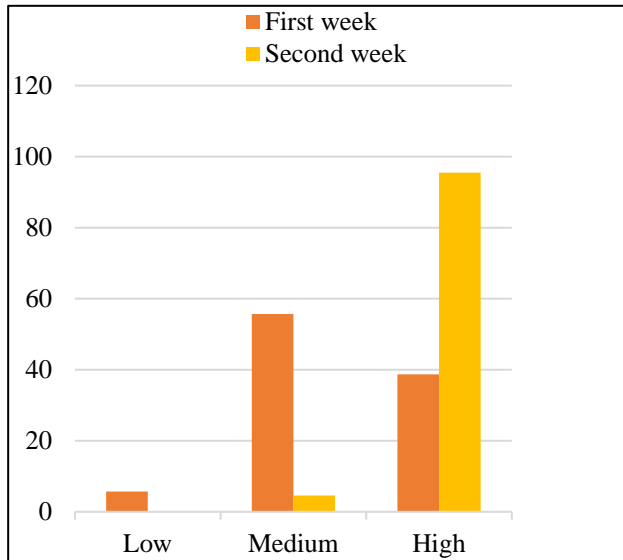


Figure 4: Distribution of overall medication adherence score.

Medication adherence during the first week is 2.193 ± 0.1301 and in the second week is 3.5227 ± 0.0704 that is significantly increased. The structured patient counselling helps the patient to increase the adherence score. Patients who reported zero score were 5/88 at the first week changed to a score 3 (40%) or 4 (20%) of high adherence (60%) at the second week of therapy. 25 patients had score one at first week and improved the score of high adherences in 24 (96%) patients and one patient scored two at the second week. Score two is increased to a score of 3 (50%), or 4 (45.8%) and decreased to two score in one patient (4.2%). 16 patients reported score 3 in first week and only one maintain the score 3 in second week (6.3%). The 15 improved to score of four at the second week. 18 patients were at score 4 during their entire treatment period.

DISCUSSION

The present study was conducted to assess the compliance of standard triple therapy. The study evaluates the medication adherence of *H. pylori* positive patients taking triple therapy. The study was conducted in 90 *H. pylori* positive patients in the gastroenterology department. Patients between the age group 18-80 were enrolled in our study. upper GI endoscopy and rapid urease test were carried out in these patients for *H. pylori* detection. The recruited patients were treated with standard triple therapy for 14 days. Standard triple therapy includes proton pump inhibitor (40 mg) bid,

amoxicillin (1000 mg) bid and clarithromycin (500 mg) bid. From the study we can assess that male patients (57%) have higher risk of getting infected with *H. Pylori* compared to females. The study also reveals that the patients of age group 40-59 were more susceptible to this infection. Patient counselling was done at the time of diagnosis and during the follow ups as required. Medication adherence were assessed using the Morisky, Green and Levin scale. The patients were followed up for the first and second week. The MGL were administered during these follow ups. In the first week the adherence was only 38.7%, with patient education and structured follow-up about 95.5% of patients were able to comply with the treatment regimen.

Although many regimens are practiced for the eradication of *H. pylori* infection, an optimal compliance is recognized as an essential factor for achieving the maximum effectiveness in any regimen, and it is obvious that adverse drug reactions can affect the extent to which the patients take medications.⁷ A direct method of adherence measurement was used in this study, where MGL scale was used as the measuring tool for the assessment. The scale consists of 4 questions which were asked to the patients by the investigator twice during the study, first after one week of the initiation of therapy and second upon completion of the treatment course. The advantages of this method were simple, easily understood by the patient allowing them to give the exact response and also inexpensive. This method also allows the patients ask questions about their problems and get information about the disease and regimen. This enhances the compliance of the patients with the treatment regimen.

A few studies showed that patients show an increase in medication adherence about 5 days after and prior to the physician's visit, this phenomenon is called as 'white coat adherence' and a randomized controlled trial demonstrated that the medication counseling and telephone call follow up after the initiation of therapy increased medication adherence up to 90%.⁸⁻¹⁰ In our study, we counselled the patients directly twice during the treatment course which could have been the major reason for obtaining a greater compliance rate of 95.6% and the motivation for patients to avoid non-compliance. A direct method of adherence measurement was used in this study, where MGL scale was used as the measuring tool for the assessment. The scale consists of 4 questions which were asked to the patients by the investigator twice during the study, first after one week of the initiation of therapy and second upon completion of the treatment course. The advantages of this method were that it is simple, easily understood by the patient allowing them to give the exact response and also inexpensive. This method also allows the patients ask questions about their problems and get information about the disease and regimen. This enhances the compliance of the patients with the treatment regimen.

For the cure of any disease the appropriate medications must be provided to obtain effective outcomes. *H. pylori* infection is one among the most common gastro-intestinal infections. Because of the increasing rate of drug resistance and lack of absolute superior antibiotics, eradication research focuses on all kind of regimes.^{11,12} Several therapies are available for *H. pylori* eradication.¹³ The standard triple therapy is the first line treatment for *H. pylori* which consists of PPI, clarithromycin and amoxicillin.¹⁴ The treatment course ranges from 7 days to 2 weeks. Lushan conference 2007 in China advocated that 14 days triple therapy is superior to 10 day and 7 days therapies.¹⁵

The fully compliance patients only 2 patients reproached with side effects and they were provided with probiotics to overcome the exhibited side effects. Probiotics can be defined as a 'live microbial organism which, when ingested, affects beneficially on human health including improvement or prevention of a specific disease state'.¹⁶ A mechanism of microbiological disruption may be involved in the development of gastro-intestinal side effects that are associated with antibiotics^[17]. Probiotics are considered as effectual tool for preventing or lowering the incidence antibiotic associated side effects. Armuzzi et al conducted study shows that probiotic supplementation during and after a standard triple *H. pylori* eradication therapy positively, influences the therapy related symptoms and overall treatment tolerance.¹⁸

CONCLUSION

A critical analysis of medication adherence suggests that compliance with short term treatment can be improved by clear instructions. Study also found that patient counselling has a positive impact on medication adherence. Providing patient education encourage patients to participate in a standard triple therapy that will result in long term benefits. There are many regimens available to treat *H. pylori* infection, even though standard triple therapy remains the first line therapy. This study helps to assess the medication adherence in *Helicobacter pylori* positive patients and it also understand that proper patient counselling can improve patient compliance and knowledge about disease and therapy adhere the patient towards the entire regimen.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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