ORIGINAL ARTICLE

Efficacy of Replacement of Esomeprazole by Vonoprazan with or without Bismuth Oxide on H.Pylori Eradication Rate

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Abstract

Background: Helicobacter pylori (H.pylori) is a gram-negative microaerophilic bacterium that colonizes the gastric mucosa of over 50% of the global population, with a high degree of geographic variability.

Infection with H. pylori leads to in a series of histological progreeion, from chronic gastritis through atrophy, intestinal metaplasia, dysplasia, and ultimately leading to intestinal-type gastric adenocarcinoma.

Aim and objectives: To assess the efficacy of replacement of esomeprazole by vonoprazan with or without bismuth oxide on the eradication rate of H. Pylori in Egyptian cases with fixation of moxifloxacine & nitazoxanide for 2 weeks.

Patients and methods: This prospective investigation was carried out on 160 cases presented with symptoms of H.pylori infection and confirmed the diagnosis by H.Pylori Ag in stool or Endoscopic Biopsy at Hepatology, Gastroenterology & Infectious diseases department at Bab-Elshaeria University Hospital & El Hussein University Hospital. Cases have been categorized into four groups; every group contains 40 cases.

Results: Vonoprazan groups (triple, quadriple) have more potency and longer lasting acid suppression than esomeprazole groups (triple, quadriple) which leading to more eradication rate of H-pylori and higher improvement after treatment. Adding bismuth oxide to either vonoprazan or esomeprazole leading to higher eradication rate and higher efficacy of treatment of H-pylori.

Conclusion: 1) Replacement of PPI (esomeprazole) by P-CAB (vonoprazan) in the treatment regimen of H. pylori leads to a higher eradication rate of H-pylori and higher improvement due to the greater potency and longer-lasting acid suppression of P-CAB compared to PPI. 2)Adding bismuth oxide to the management protocol of H. pylori leads to a greater rate of eradication and more efficacy of H. pylori treatment.

Keywords: H-pylori eradication rate; esomeprazole; vonoprazan; bismuth oxide

1. Introduction

Helicobacter pylori (H.pylori) is a gram-negative microaerophilic bacterium that colonizes the gastric mucosa of over 50% of the global population, with a high degree of geographic variability.[1] infection with H. Pylori might result in a sequential histological progression from chronic gastritis through atrophy, intestinal metaplasia, dysplasia, and finally leading to an intestinal-type gastric adenocarcinoma.1 Vonoprazan, a potassium-competitive acid blocker, exhibits a more potent acid-inhibitory impact compared to proton pump inhibitors (PPIs). Vonoprazan demonstrated a superior eradication rate for Helicobacter pylori in comparison to proton pump inhibitors.[2]

Bismuth-based triple or quadruple treatment protocols have been frequently advocated for the management of Helicobacter pylori infections. So far, the molecular mechanisms through which bismuth inhibits the growth of Helicobacter pylori have been unclear.[3]

Stool antigen tests (SATs) are noninvasive diagnostic instruments for the detection of Helicobacter pylori infection. Two forms of stool antigen tests are available for the identification of Helicobacter pylori infection: one that is based on immunochromatography (ICA) and the other on enzyme immunoassay (EIA) .[4]

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Nitazoxanide (NTZ), an anti-protozoal medication, has been proven to have a rate of cure of over eighty percent in cases that are treatment-naïve and those who have failed previous treatments.

Moxifloxacin (MOXI), a fluoroquinolone antibiotic, has demonstrated exceptional safety and compliance in the treatment of Helicobacter pylori.[5]

The selection of tests available in the post-therapy setting is restricted. Serologic tests are unpredictable in their ability to identify eradication. While endoscopic tests (histologic examination, culture or rapid urease test) are reliable, they are also costly as well as inconvenient.

In recent years, the fecal antigen test was a singular, noninvasive test that frequently illustrated the success of eradication.[6]

Bismuth salts, which contain luminal bismuth, have a direct bactericidal impact on Helicobacter pylori in the upper gastrointestinal tract. They inhibit ATP synthesis, adherence to the gastric mucosa, and enzymes by forming complexes in the periplasmic space and bacterial wall. Bismuth also promotes the healing of ulcers through raising mucosal protective factors and functioning as a barrier against aggressive factors.[7]

The aim of this investigation was to assess the effectiveness of the replacement of esomeprazole by vonoprazan with or without bismuth oxide on the rate of eradication of Helicobacter pylori in Egyptian Patients with the fixation of moxifloxacine and nitazoxanide for 2 weeks.

2. Patients and methods

This prospective investigation has been carried out on 160 cases presented with symptoms of H.pylori infection as (Burning pain or discomfort in the upper abdomen, nausea and/or vomiting, bloating, indigestion, filling full, hematmesis, anorexia, loss of weight) and confirm the diagnosis by H.pylori Ag in stool or Endoscopic Biopsy at Hepatology, Gastroenterology & Infectious diseases department at Bab-Elshaeria university Hospital & El Hussein university Hospital, Faculty of medicine, Al-azhar university. Patients have been categorized into four groups; every group contains 40 patients:

(Group 1): Esomeprazole triple therapy (40 patients received esomeprazole 40 mg twice daily ½ hr before meal, moxifloxacin 400 milligram once per day after lunch, nitazoxanide 500 milligram twice per day after meal → for 2 weeks.

(Group 2): Vonoprazan triple therapy (40 patients received vonoprazan 20 milligram twice per day with a meal, moxifloxacin 400 milligram once daily after lunch, and nitazoxanide 500 milligram twice per day after a meal → for 2 weeks.

(Group 3): Esomeprazole quadruple therapy (40 patients received as group 1 + addition of bismuth oxide 120 mg 2 tab ½ hr before meal twice daily→ for 2 weeks.

(Group 4): Vonoprazan quadruple therapy (40 patients received as group 2 + addition of bismuth oxide 120 mg 2 tab ½ hr before meal twice daily→ for 2 weeks.

Inclusion criteria: Symptomatic cases with positive H.Pylori infection and age over eighteen years old.

Exclusion criteria: Age less than eighteen years old, patients with a past history of resistance to treatment, pregnant women, lactating women, and patients who refuse to participate in the investigation.

All cases have been subjected to: Full history taking, physical examinations, local examination, and investigational studies including (CBC , ESR , ALT , AST , S.Urea , S.creatinine , H.pylori Ag in stool , Upper endoscopy when indicated , Pelvi-abdominal ultrasound) .

Outcomes measurements and follow-up:

Each patient underwent two follow-ups:

The first follow-up evaluated medication adherence, adverse events, and allergic symptoms in patients after therapy. It assessed whether additional medications, like acid-suppressing agents, were needed. Allergic symptoms like urticaria, throat edema, or erythema gradually recovered following the end of treatment. Acid-suppressing medications are utilized to promote healing in peptic ulcer cases. The second follow-up has been performed 4 weeks following therapy stopping, evaluating the successful elimination of H. Pylori in stool. The Morisky Medication Adherence Scale-8 (MMAS-8) and tablet counting have been utilized to conduct an exhaustive assessment of the patients' drug adherence. A score of less than six, 6–<8, and eight indicates poor, moderate, and excellent adherence, respectively. The full MMAS-8 score is 8.[8] The adherence scale has been assessed for validity and reliability in the Chinese population, and the aggregate Cronbach's alpha coefficient was 0.83.[9] Cases have been deemed to have excellent adherence if they consumed over ninety percent of the tablets during the tablet counting process.[10] The investigation assessed the occurrence of adverse events (AEs) and categorized them as mild, moderate, or severe severity. Mild adverse events need no therapy, moderate adverse events have been managed with therapy, and severe adverse events demanded hospitalization or study-related mortality. In the MITT analysis, cases that were

not followed up on were deemed to have experienced adverse events.

Outcome assessment:

In the study, the H. pylori eradication rate was evaluated using two methods: modified intention-to-treat population (MITT), in which cases who were lost to follow-up were deemed unsuccessful, and per-protocol (PP), in which those who were lost to follow-up were considered dropout cases and excluded from subsequent statistical analysis. The eradication rate for each cohort was the primary result evaluation.

Ethical Considerations:

Al-Azhar University's Committee of Hepato-gastroenterology and Infectious Diseases Department and the Committee of the Faculty of Medicine have both approved the current protocol, which was subsequently approved by the university's ethical committee. The ethical committee of Al-Azhar University approved the consent of all cases that participated in the current investigation.

3. Results

Table 1. general characteristics of groups under investigation.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER=40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER =40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER =40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NUMBER =40)	P-VALUE
AGE MEAN± SD	37.9±14.11	38.38 ±13.8	35.7±12.17	37.3±13.23	0.821
SEX					
MALE	17 (42.5%)	20 (50%)	20 (50%)	19 (47.5%)	0.895
FEMALE	23 (57.5%)	20 (50%)	20 (50%)	21 (52.5%)	
MARITAL STATUS					
SINGLE	14 (35%)	11 (27.5%)	12 (30%)	13 (32.5%)	0.900
MARRIED	26 (65%)	29 (72.5%)	28 (70%)	27 (67.5%)	
RESIDENCE					
URBAN	15 (37.5%)	16 (40%)	17 (42.5%)	15 (62.5%)	0.962
RURAL	25 (62.5%)	24 (60%)	23 (57.5%)	25 (37.5%)	

P value greater than 0.05: Not significant, P value less than 0.05 is statistically significant, p less than 0.001 is highly significant.

According to patient's characteristics, there was statistically insignificant variance among the groups under investigation in terms of age, gender, marital status and residence.

Table 2. comparison between studied groups as regard medical history.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER =40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER =40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER =40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NUMBER =40)	P-VALUE
MEDICAL HISTORY					
EPIGASTRIC PAIN	22 (55%)	21 (52.5%)	21 (52.5%)	25 (62.5%)	
DYSPEPSIA	11 (27.5%)	11 (27.5%)	7 (17.5%)	7 (17.5%)	
VOMITING	1 (2.5%)	3 (7.5%)	6 (15%)	0 (0%)	
HEMATEMESIS	1 (2.5%)	0 (0%)	0 (0%)	0 (0%)	
ABDOMINAL DISTENSION	0 (0%)	1 (2.5%)	4 (10%)	4 (10%)	
W.T LOSS	1 (2.5%)	1 (2.5%)	0 (0%)	1 (2.5%)	
ANOREXIA	1 (2.5%)	2 (5%)	2 (5%)	2 (5%)	
FATIGUE	0 (0%)	1 (2.5%)	0 (0%)	0 (0%)	0.24
ANOREXIA & DYSPEPSIA	2 (5%)	0 (0%)	0 (0%)	0 (0%)	
CONSTIPATION &ABDOMINAL DISTENTION	1 (2.5%)	0 (0%)	0 (0%)	0 (0%)	
HEADACHE & ABD. PAIN	0 (0%)	0 (0%)	0 (0%)	1 (2.5%)	

According to patient's history, there was statistically insignificant variance among the groups under investigation in terms of medical history .

Table 3. comparison among groups under investigation as regard patient's examination.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER =40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER =40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER =40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NUMBER=40)	P-VALUE
GENERAL EXAMINATION					
AVERAGE BUILT	30 (75%)	33 (82.5%)	34 (85%)	33 (82.5%)	
PALLOR	10 (52%)	6 (17.5%)	5 (15%)	5 (15%)	0.55
UNDER BUILT	2 (5%)	1 (2.5%)	1 (2.5%)	0 (0%)	
ABDOMINAL TENDERNESS	26 (65%)	28 (70%)	29 (72.5%)	30 (75%)	0.79

According to patient's examination, there was statistically insignificant variance among the groups

under investigation in terms of general examination and abdominal tenderness

Table 4. comparison among groups under investigation in terms of laboratory investigations.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER=40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER=40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER=40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NUMBER=40)	P-VALUE
HB MEAN± SD	11.6±1.49	11.7±1.42	12.2±1.51	12.3±1.36	0.079
WBCS MEAN± SD	5.83±1.3	6.01±1.4	5.96±1.5	5.48±1.3	0.339
PLT MEAN± SD	282.1±62.5	313.3±297.5	264.5±47.7	285±52.06	.0571
ESR MEAN± SD	17.55±10.26	15.1±8.1	13.25±7.01	13.22±6.6	0.060
ALT MEAN± SD	21.6±9.54	19.08±7.73	21.3±9.19	20.27±9.21	0.578
AST MEAN± SD	21.85±8.73	19.55±7.65	21.38±10.7	21.43±9.24	0.683
UREA MEAN± SD	15.3±4.5	16.1±4.1	15.7±4.3	16.4±4.02	0.67
CREATININE MEAN± SD	1.01±0.15	1.05±0.05	0.98±0.23	1.03±0.11	0.19

According to laboratory investigations, there was statistically insignificant variance among the groups under investigation in terms of HB, WBCs, PLT, ESR, ALT, AST, Urea & Creatinine.

Table 5. comparison among groups under investigation in terms of Ultrasound findings.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER=40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER=40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER=40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NU,BER=40)	P-VALUE
ULTRASOUND					
NORMAL STUDY	36 (90%)	38 (95%)	38 (95%)	37 (92.5%)	
FATTY LIVER	2 (5%)	1 (2.5%)	0 (0%)	1 (2.5%)	
L.T RENAL STONE	1 (2.5%)	0 (0%)	0 (0%)	0 (0%)	
CALCULAR G.B È NO SIGNS OF CHOLECYSTITIS	1 (2.5%)	0 (0%)	0 (0%)	0 (0%)	
CALCULAR G.B È MUD	0 (0%)	0 (0%)	1 (2.5%)	0 (0%)	
BULKY PANCREAS	0 (0%)	1 (2.5%)	0 (0%)	0 (0%)	
PERIPORTAL FIBROSIS È NO SIGNS OF PORTAL HTN	0 (0%)	0 (0%)	1 (2.5%)	0 (0%)	0.52
ENLARGED PROSTATE	0 (0%)	0 (0%)	0 (0%)	1 (2.5%)	
G.B SURGICALLY REMOVED	0 (0%)	0 (0%)	0 (0%)	1 (2.5%)	

According to ultrasound findings, there was statistically insignificant variance among the groups under investigation in terms of ultrasound.

Table 6. comparison among groups under investigation in terms of improvement of symptoms after treatment course.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER=40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER=40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER=40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NUMBER=40)	P-VALUE
IMPROVEMENT OF SYMPTOMS AFTER TREATMENT COURSE					
IMPROVED	32 (80%)	38 (95%)	35 (87.5%)	39 (97.5%)	P=0.03
NOT IMPROVED	8 (20%)	2 (5%)	5 (12.5%)	1 (2.5%)	P1: 0.04 P2: 0.36 P3: 0.01 P4: 0.235 P5: 0.55 P6: 0.08

. p= total p-value, P1=Group 1 vs Group 2, P2=Group 1 vs Group 3, P3=Group 1 vs Group 4, P4=Group 2 vs Group 3, P5=Group 2 vs Group 4, p6=Group 3 vs Group 4

According to improvement of symptoms after treatment course, there was statistically significant variance higher in Vonoprazan quadriple Therapy than other groups.

Table 7. comparison among groups under investigation in terms of H. Pylori eradication 1 month after Cessation of treatment.

	ESOMEPRAZOLE TRIPLE THERAPY (GROUP 1) (NUMBER=40)	VONOPRAZAN TRIPLE THERAPY (GROUP 2) (NUMBER=40)	ESOMEPRAZOLE QUADRIPLE THERAPY (GROUP 3) (NUMBER=40)	VONOPRAZAN QUADRIPLE THERAPY (GROUP 4) (NUMBER=40)	P-VALUE
H-PYLORI AG IN STOOL 1 MONTH AFTER CESSATION OF TREATMENT					
POSITIVE	10 (25%)	3 (7.5%)	4 (10%)	1 (2.5%)	P=0.01
NEGATIVE	30 (75%)	37 (92.5%)	36 (90%)	39 (97.5%)	P1: 0.03 P2: 0.07 P3: 0.003 P4: 0.69 P5: 0.30 P6: 0.165

According to follow up of H-pylori eradication, there was statistically significant variance higher in vonoprazan quadriple Therapy than other groups .

Table 8. comparison between esomeprazole and Vonoprazan groups as regard improvement of symptoms after treatment course and h.pylori eradication 1 month after Cessation of treatment.

	ESOMEPRAZOLE GROUPS (GROUP 1) AND (GROUP 3) (NUMBER=80)	VONOPRAZAN GROUPS (GROUP 2) AND (GROUP 4) (NUMBER=80)	P-VALUE
IMPROVEMENT OF SYMPTOMS AFTER TREATMENT COURSE			
IMPROVED	67 (83.75%)	77 (96.25%)	0.008
NOT IMPROVED	13 (16.25%)	3 (3.75%)	
H-PYLORI AG IN STOOL 1 MONTH AFTER CESSATION OF TREATMENT			
POSITIVE	14 (17.5%)	4 (5%)	0.012
NEGATIVE	66 (82.5%)	76 (95%)	

According to improvement of symptoms after treatment course, there was statistically significant variance higher in Vonoprazan groups than esomeprazole groups. According to follow up of H-pylori eradication, there was statistically significant variance higher in vonoprazan groups than esomeprazole groups.

Table 9. comparison among Bismuth and non-bismuth groups as regard improvement of symptoms after treatment course and H. Pylori eradication 1 month after Cessation of treatment.

	BISMUTH GROUPS (GROUP 3) AND (GROUP 4) (NUMBER=80)	NON BISMUTH GROUPS (GROUP 1) AND (GROUP 2) (NUMBER=80)	P-VALUE
IMPROVEMENT OF SYMPTOMS AFTER TREATMENT COURSE			
IMPROVED	74 (92.5%)	70 (87.5%)	0.291
NOT IMPROVED	6 (7.5%)	10 (12.5%)	
H-PYLORI AG IN STOOL 1 MONTH FOLLOWING CESSATION OF MANAGEMENT			
POSITIVE	5 (6.25%)	13 (16.25%)	0.045
NEGATIVE	75 (93.75%)	67 (83.75%)	

According to improvement of symptoms after treatment course, there was statistically insignificant variance among bismuth groups and non-bismuth groups but there is higher improvement in bismuth groups. According to follow up of H-pylori eradication, there was statistically significant variance higher in bismuth groups than non-bismuth groups.

4. Discussion

According to patient'spatient's characteristics, there was statistically insignificant difference among the groups under investigation in terms of age, sex, marital status and residence.

This was consistent with the aims of Zhang et al.,[11] who sought to compare the effectiveness and safety of a fourteen-day bismuth quadruple therapy and a fourteen-day VPZ-containing triple treatment. The participants have been randomly assigned to one of 4 groups: the VDF-triple group received VPZ (twenty milligrams, bid) + doxycycline (one hundred milligrams, bid) + furazolidone (one hundred milligrams, bid), the VDA-triple group received VPZ + doxycycline + amoxicillin (1,000 milligrams, bid), the EBDF-quadruple group received esomeprazole (EPZ) (twenty milligrams, bid) + bismuth (220 milligrams, bid) + doxycycline + furazolidone, and the EBDA quadruple group received EPZ + bismuth + doxycycline + amoxicillin. They discovered that there was statistically insignificant variance between the groups under investigation in terms of gender and age.

Regarding medical history in the groups under investigation, we demonstrated that there was statistically insignificant variance among the groups under investigation in terms of epigastric pain, dyspepsia, vomiting, hematemesis, abdominal distension, weight loss, anorexia, fatigue, constipation, headache, and abdominal pain. There was statistically insignificant variance among the groups under investigation in terms of general examination (average built, pallor, under built) and abdominal tenderness (P >0.05).

Our findings are in line with Liang et al.[12] who aimed to explore the efficiency of a novel management protocol that combines amoxicillin, bismuth, and vonoprazan for the eradication of

Helicobacter pylori. A total of 600 cases infected with Helicobacter pylori have been recruited for this multicenter randomized controlled trial. They reported that regarding clinical presentations, there was statistically insignificant variance among the groups under investigation in terms of epigastric pain, epigastric distension, regurgitation/heartburn, frequent belching, and nausea/vomiting.

In our investigation we revealed that there was statistically insignificant variance among the groups under investigation in terms of ultrasound findings (P >0.05).

Our outcomes are in line with Ahmed et al.,[13] who found that there was statistically insignificant variance between the three studied groups regarding findings of abdominal US [p>0.05].

Regarding the improvement of symptoms after the treatment course, a statistically significant variance was detected among the groups under investigation (P=0.03). There was significant higher improvement after treatment of vonoprazan triple 38 (95%) when compared to esomeprazole triple therapy 32 (80%) with P-value=0.04. There was significant higher improvement after treatment of vonoprazan quadriple 39 (97.5%) when compared to esomeprazole triple therapy 32 (80%) with p-value =0.01.

Our results are consistent with Ahmed et al.,[13] who found that there was significant higher efficacy after treatment of Vonoprazan triple when compared to proton pump inhibitor triple treatment.

According to H-pylori Ag in stool 1 month following cessation of treatment, we reported that there was statistically significantly higher H-pylori Ag in stool in esomeprazole triple therapy 10 (25%) when compared to vonoprazan triple therapy 3 (7.5%) and vonoprazan quadriple therapy 1 (2.5%) with p-value 0.03 and 0.003, respectively. The eradication level was statistically significantly lower in esomeprazole triple therapy 30 (75%) when compared to vonoprazan triple therapy 37 (92.5%) and vonoprazan quadriple therapy 39 (97.5%) with p-value 0.03 and 0.003, respectively.

Our findings are in agreement with Lu et al.,[14] who suggested that quadruple treatment, which includes vonoprazan twenty milligrams daily for ten or fourteen days, has acceptable effectiveness for the eradication of H. pylori, in contrast to the well-known high-potency proton pump inhibitor (esomeprazole twenty milligrams twice daily) for fourteen days. The eradication rates in the V10, V14, and E14 groups were 98.5 percent, 97.3 percent, and 94.8 percent, respectively. In quadruple treatments for the eradication of H. pylori, vonoprazan was as efficacious as esomeprazole.

The eradication rates of the VPZ-containing triple, VPZ-quadriple treatment, and quadruple therapy of proton pump inhibitor (PPI) groups were 88.4 percent, 92.7 percent, and 88.4 percent, respectively, when analyzed per-protocol. However, there was insignificant variance (P>0.05).

Our findings are in agreement with Zhang et al.,[11], who stated that H. pylori was effectively eradicated in the VDF-triple, VDA-triple, EBDF-quadruple, and EBDA-quadruple therapy groups, respectively, in 88.13 percent, (87.50 percent), (eighty percent), and (seventy-five percent) of the patients. The eradication rate was significantly greater in the VDF-triple group, and a greater eradication rate has been found in the VPZ-containing triple treatment.

According to the improvement of symptoms after treatment course, we demonstrated that there was statistically significantly higher improvement in the vonoprazan group 77 (96.25%) than the esomeprazole group 67 (83.75%) with p-value=0.008. According to H-pylori eradication 1 month after cessation of treatment, we reported that there was statistically significantly higher H-pylori Ag in stool in the esomeprazole group 14, 17.5%) than the vonoprazan group 4 5%) with p-value=0.012. Vonoprazan groups 76 (95%) had higher negative H pylori outcomes following management when compared to esomeprazole groups 66 (82.5%), with p-value=0.012.

This came in accordance with Zuberi et al.,[15] who stated that out of eighty-seven patients in the esomeprazole group and 92 cases in the vonoprazan group, seventy-three (83.9 percent) cases in the esomeprazole group and eighty-six (93.5 percent) cases in the vonoprazan group had negative H pylori outcomes, respectively, following man agent, p -p-value equal to .042. Compared to conventional triple therapy based on proton pump inhibitors, vonoprazan therapy is more likely to eradicate H. pylori. There was statistically significantly higher H. pylori stool Ag in the esomeprazole group than in the vonoprazan group.

According to improvement of symptoms after treatment course, we reported that the improvement higher in bismuth groups than non-bismuth groups but no statistically significant difference among bismuth groups and non-bismuth groups. According to follow up of H-pylori Ag, we found that there was statistically significant higher H-pylori Ag in non-bismuth groups 13 (16.25%) than bismuth groups 5 (6.25%) with p-value equal 0.045.

An investigation by Sun et al.,[16] who found that

bismuth-containing quadruple treatment achieved intention-to-treat (ITT) success rate ninety-three percent and could be suggested as the 1st line eradication protocols.

In contrast, the meta-analysis Munoz et al.,[17] reported quadruple therapies have better cure rate than triple (83.2 percent vs 76.1 percent, OR: 0.59:0.38-0.93; P-value equal to .02).

4. Conclusion

Replacement of PPI (esomeprazole) by P-CAB (vonoprazan) in treatment regimen of H-pylori leading to more eradication rate of H-pylori and higher improvement due to more potency and longer lasting acid suppression of P-CAB than PPI . Adding bismuth oxide to the management regimen of H-pylori leading to higher rate of eradication and more efficacy of H-pylori treatment.

Disclosure

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References

1. Kaneko K, Zaitoun AM, Letley DP, Rhead JL, Torres J, Spendlove I et al. The active form of Helicobacter pylori vacuolating cytotoxin induces decay-accelerating factor CD55 in association with intestinal metaplasia in the human gastric mucosa. J Pathol. 2022;258(2):199-209.
2. Kiyotoki S, Nishikawa J, Sakaida I. Efficacy of Vonoprazan for Helicobacter pylori Eradication. Intern Med. 2020;59(2):153-161.
3. Liu J, Li X, Zhu Y, Ge R. Molecular Mechanisms of Bismuth-Containing Drugs Against Helicobacter Pylori: A Further Update. Current Pharmacology Reports. 2023 Feb;9(1):59-65.
4. Shimoyama T. Stool antigen tests for the management of Helicobacter pylori infection. World J Gastroenterol. 2013;19(45):8188-8191. doi:10.3748/wjg. v19.i45.8188
5. Szadkowski A, Zemlak M, Muszyński J. Effectiveness of Helicobacter pylori eradication established on the basis of examination of antibiotic resistance of the bacteria. Prz Gastroenterol. 2018;13(2):93-98.
6. Cardos AI, Maghiar A, Zaha DC, et al. Evolution of Diagnostic Methods for Helicobacter pylori Infections: From Traditional Tests to High Technology, Advanced Sensitivity and Discrimination Tools. Diagnostics (Basel). 2022;12(2):508.
7. Alkim H, Koksal AR, Boga S, Sen I, Alkim C. Role of Bismuth in the Eradication of Helicobacter pylori. Am J Ther. 2017;24(6):e751-e757.
8. Morisky DE, Ang A, Krousel-Wood M, Ward HJ. Predictive validity of a medication adherence measure in an outpatient setting [retracted in: J Clin Hypertens (Greenwich). 2023 Sep;25(9):889. doi: 10.1111/jch.14718 J Clin Hypertens (Greenwich). 2023 Sep;25(9):890. doi: 10.1111/jch.14712]. J Clin Hypertens (Greenwich). 2008;10(5):348-354.
9. Si ZX, Guo LX, Zhou M, Cao GQ. Reliability and validity of the modified morisky medication adherence scale applied to patients on warfarin therapy after mechanical heart-valve replacement. J Nurs Sci. 2012;27(22):23-6.
10. Georgopoulos S, Papastergiou V, Xirouchakis E, Laudi F, Papantoniou N, Lisgos P, Spiliadi C, Fragou P, Skorda L, Karatapanis S. Evaluation of a Four-drug, Three-antibiotic, Nonbismuth–containing "Concomitant" Therapy as First-line Helicobacter pylori Eradication Regimen in Greece. Helicobacter. 2012 Feb;17(1):49-53.
11. Zhang Z, Liu F, Ai F, et al. The efficacy and mechanism of vonoprazan-containing triple therapy in the eradication of Helicobacter pylori. Front Pharmacol. 2023;14:1143969.
12. Liang JW, Xiong S, Jia YG, Xiao D, Tan SY, Cao JW et al. Comparison of vonoprazan bismuth-containing triple therapy with quadruple therapy in Helicobacter pylori-infected treatment-naive patients: a prospective multicenter randomized controlled trial. J Gastroenterol Hepatol. Published online July 16, 2024. doi:10.1111/jgh.16679
13. Ahmed MK, Mossa WM, Rezk AA, Elhamshary NK. Vonoprazan versus Conventional Proton Pump Inhibitors Based Regimens in Helicobacter Pylori Eradication Therapy. International Journal of Medical Arts. 2023 Oct 1;5(10):3720-6.
14. Lu L, Wang Y, Ye J, et al. Quadruple therapy with vonoprazan 20 mg daily as a first-line treatment for Helicobacter pylori infection: A single-center, open-label, noninferiority, randomized controlled trial. Helicobacter. 2023;28(1):e12940.
15. Zuberi BF, Ali FS, Rasheed T, Bader N, Hussain SM, Saleem A. Comparison of Vonoprazan and Amoxicillin Dual Therapy with Standard Triple Therapy with Proton Pump Inhibitor for Helicobacter Pylori eradication: A Randomized Control Trial. Pak J Med Sci. 2022;38(4Part-II):965-969.
16. Sun Q, Liang X, Zheng Q, et al. High efficacy of 14-day triple therapy-based, bismuth-containing quadruple therapy for initial Helicobacter pylori eradication. Helicobacter. 2010;15(3):233-238.
17. Muñoz N, Sánchez-Delgado J, Baylina M, et al. Systematic review, meta-analysis, and meta-regression: Successful second-line treatment for Helicobacter pylori. Helicobacter. 2018;23(3):e12488.