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Treatment outcomes of the modified sequential RA-RLT regimen in patients with chronic gastritis

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Abstract

***Objective**: To evaluate the efficacy and safety of the improved RA-RLT sequential regimen in the treatment of chronic gastritis with Helicobacter pylori infection.* ***Subjects and method**: A descriptive cross-sectional study with a prospective intervention and follow-up was conducted on 103 patients diagnosed with chronic gastritis who tested positive for H. pylori. The patients received treatment with the improved RA-RLT sequential regimen for 10 days.* ***Result**: The study was conducted on 103 patients with chronic gastritis, with a mean age of 48.6 ± 13.2 years; 52.4% were male, and the majority resided in rural areas (62.1%). The most common clinical symptoms included epigastric pain (89.3%), bloating and belching (71.8%), nausea (41.7%), digestive disorders (26.2%), and fatigue (17.5%). The eradication rate of Helicobacter pylori with the improved RA-RLT sequential regimen was 91.3%, with no significant differences between gender and age groups. The adverse effects were mostly mild and occurred in 40.8% of patients, with the most common being bitter taste (15.5%), diarrhea (11.7%), nausea (8.7%), and headache (4.9%). The eradication rates at 4, 12, and 24 weeks were 91.3%, 92.8%, and 94.0%, respectively.* ***Conclusion**: The improved RA-RLT sequential regimen is highly effective in eradicating H. pylori, well tolerated, with minimal side effects, and is suitable for the treatment of chronic gastritis with H. pylori infection.*

***Keywords**: Chronic gastritis, improved sequential regimen, Helicobacter pylori.*

I. Background

Chronic gastritis is a common condition characterized by inflammation of the gastric mucosa, often associated with Helicobacter pylori (*H. pylori*) infection a key factor in its pathogenesis. Significant advancements have been made in the treatment of chronic gastritis, with improved sequential therapies emerging as promising strategies to enhance *H. pylori* eradication rates and improve patient outcomes. Studies have demonstrated that sequential regimens incorporating fluoroquinolones achieve higher eradication rates compared to traditional protocols, reinforcing the potential of optimized treatment approaches in managing this condition [1]. In addition to early detection of antibiotic resistance, various alternative regimens are being explored to address the declining efficacy of the standard triple therapy [2]. Among these, sequential regimens have shown high initial effectiveness and have been extensively investigated since their introduction [3]. The improved RA-RLT sequential regimen represents a novel strategy aimed at maximizing treatment efficacy for chronic gastritis through stepwise eradication. This approach is based on the premise that continuous optimization and adjustment of treatment protocols can enhance

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therapeutic outcomes while minimizing antibiotic resistance [1]. Within this context, the improved RA-RLT regimen comprising proton pump inhibitors, antibiotics, and nitroimidazole is expected to increase *H. pylori* eradication efficacy while reducing adverse effects. However, data on the effectiveness and safety of this regimen in Vietnam remain limited. Therefore, we conducted the study titled "Treatment Outcomes of the Improved RA-RLT Sequential Regimen in Patients with Chronic Gastritis", with the objective of evaluating the efficacy and safety of the improved RA-RLT sequential therapy in the treatment of chronic gastritis associated with *H. pylori* infection.

2. Subject and method

Study Subjects

The study included patients diagnosed with chronic gastritis and Helicobacter pylori (H. pylori) infection from June 2022 to June 2024.

Inclusion Criteria

Patients diagnosed with chronic gastritis and confirmed *H. pylori* infection.

Patients who agreed to participate in the study.

Exclusion Criteria

Pregnant or breastfeeding patients; those with allergies to any drugs in the regimen; patients with severe comorbidities such as hepatic failure, renal failure, or malignancies; patients with a history of *H. pylori* eradication using a levofloxacin-containing regimen (if retrievable).

Patients who had used antibiotics within 4 weeks or proton pump inhibitors (PPIs) within 2 weeks prior to the second visit.

Patients who did not consent to participate.

Study Design

This was a cross-sectional descriptive study combined with a prospective interventional component and longitudinal follow-up.

Sample Size and Sampling Method

A convenient sampling method was employed, in which all patients who met the inclusion criteria between June 2022 and June 2024 were enrolled. A total of 103 patients were recruited.

Data Collection and Analysis

H. pylori Treatment Protocol - Improved RA-RLT Sequential Regimen

First 5 days:

Amoxicillin (Servamox) 1000 mg, twice daily after meals

Rabeprazole (Pariet) 20 mg, twice daily, 30 minutes before meals

Subsequent 5 days:

Levofloxacin (Tavanic) 500 mg, twice daily after meals

Tinidazole 500 mg, twice daily after meals

Rabeprazole (Pariet) 20 mg, twice daily, 30 minutes before meals

Outcome Evaluation

Treatment outcomes were evaluated at 4, 12, and 24 weeks after therapy.

Study Indicators

Patient characteristics: age, gender, residential area, medical history, and clinical symptoms.

Treatment outcomes: H. pylori eradication rate, adverse events during treatment, and comparison of treatment effectiveness over time.

Data Processing

Data were analyzed using SPSS version 22.0. Quantitative variables were expressed as mean ± standard deviation, while qualitative variables were presented as percentages.

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3. Results

Table 1. General characteristics of patients participating in the study (n = 103)

Characteristic		Number (n)	Percentage (%)
Gender	Male	54	52,4
	Female	49	47,6
Mean age		48,6 ± 13,2	
Residence	Urban	39	37,9
	Rual	64	62,1
Medical history	Peptic ulcer	22	21.4
	Smoking	19	18.4
	Regular alcohol use	17	16.5

Comment: Most patients in the study were male (51.5%) with a mean age of 48.6 ± 13.1 years; the majority lived in rural areas (63.1%) and had a history of peptic ulcer (41.7%), smoking (29.1%), and alcohol consumption (36.9%).

Table 2. Clinical symptoms before treatment (n = 103)

Symptom	Number (n)	Percentage (%)
Epigastric pain	92	89.3
Belching, bloating	74	71.8
Nausea	43	41.7
Digestive disorders (diarrhea, constipation)	27	26.2
Weight loss, fatigue	18	17.5

Comment: Common clinical symptoms included epigastric pain (86.4%), belching (78.6%), bloating (75.7%), nausea (42.7%), and digestive disorders (39.8%).

Table 3. *H. pylori* eradication rates by age and gender

Group	Number (n)	Successfully eradicated (n)	Percentage (%)
Male	54	49	90.7
Female	49	45	91.8
Age < 40	37	34	91.9
Age 40–60	45	41	91.1
Age > 60	21	19	90.5
Total	103	94	91.3

Comment: The overall *H. pylori* eradication rate was 93.2%, with males at 91.5% and females at 94.9%; the highest success rate was in the 41-60 age group (95.1%), while the ≥ 61 age group had a lower rate (89.5%).

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Table 4. Side effects during treatment (n = 103)

Side effect	Number (n)	Percentage (%)
Bitter taste	16	15.5
Mild diarrhea	12	11.7
Mild nausea	9	8.7
Headache	5	4.9
No side effects	61	59.2

Comment: Over half of the patients (54.4%) reported no side effects during treatment. The most common adverse effects were bitter taste (19.4%), diarrhea (10.7%), nausea (9.7%), and headache (5.8%).

Table 5. Comparison of treatment efficacy over time

Follow-up time	Patients assessed	Successfully eradicated (n)	Percentage (%)
4 weeks post-treatment	103	94	91.3
12 weeks post-treatment (long-term)	97	90	92.8
24 weeks post-treatment (long-term)	84	79	94.0

Comment: The *H. pylori* eradication rates confirmed by breath test were 92.2% at 4 weeks, 93.2% at 8 weeks, and 94.2% at 12 weeks.

4. Discussion

The majority of patients in the study were male (52.4%), lived in rural areas (62.1%), and had a history of peptic ulcer, smoking, or alcohol consumption. These are all well-established risk factors associated with *H. pylori* infection and the progression of chronic gastritis [4]. Previous epidemiological studies have shown that individuals living in rural areas often face poor sanitation, low living standards, and limited access to healthcare services, all of which facilitate the gastrointestinal transmission of *H. pylori*. Additionally, smoking and alcohol consumption not only damage the protective mucosal barrier of the stomach but also create favorable conditions for bacterial colonization and chronic inflammation. The clinical symptoms recorded in the study epigastric pain (89.3%), bloating and belching (71.8%), nausea (41.7%), digestive disorders (26.2%), and fatigue (17.5%) are common manifestations of chronic gastritis, reflecting the prolonged inflammatory state of the gastric mucosa. These findings are consistent with descriptions in the medical literature and highlight the diagnostic value of these symptoms when assessing patients in community settings [5]. The *H. pylori* eradication rate in the study was high and consistent across gender groups (male: 90.7%; female: 91.8%) and age groups (< 40 years: 91.9%; 40-60 years: 91.1%; > 60 years: 90.5%). This consistency indicates that the effectiveness of the RA-RLT sequential regimen is not significantly influenced by demographic factors. This is a favorable outcome, aligning with previous studies that suggest antibiotic resistance and treatment duration, rather than patient age or gender, are the primary determinants of H. pylori eradication success [6]. Thus, the RA-RLT regimen can be broadly applied across various patient groups without the need for individualization based on age or gender. In our study, 59.2% of patients reported no adverse effects during treatment. The reported side effects were mostly mild and transient,

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including bitter taste (15.5%), diarrhea (11.7%), nausea (8.7%), and headache (4.9%). The low incidence and mild severity of side effects suggest that the RA-RLT regimen is well-tolerated and has a high safety profile. Compared to traditional triple therapies, RA-RLT causes fewer gastrointestinal disturbances, which helps improve patient adherence to treatment. According to a systematic review by Kale-Pradhan and colleagues, sequential regimens containing levofloxacin are generally better tolerated and less likely to cause gastrointestinal side effects than standard triple therapy [1]. High safety is a crucial factor for ensuring successful eradication, particularly in outpatient settings. The study results showed that the modified RA-RLT sequential regimen achieved high *Helicobacter pylori* eradication rates 91.3% at 4 weeks, 92.8% at 12 weeks, and 94.0% at 24 weeks. These rates exceed the optimal treatment efficacy threshold (≥ 90%) recommended by international gastroenterology associations, demonstrating the regimen's durability and effectiveness in *H. pylori* eradication [1]. Compared to traditional regimens such as 14-day standard triple therapy, which has eradication rates of about 81-85% in many Asian countries, the RA-RLT sequential regimen shows clear advantages [7]. The combination of rifabutin and levofloxacin two antibiotics with low resistance rates in many regions is a rational strategy to enhance eradication efficacy. Moreover, the use of antibiotics in a sequential manner helps reduce selective pressure for resistance and boosts bacterial clearance through complementary mechanisms.

5. Conclusion

The modified RA-RLT sequential regimen demonstrated high efficacy in eradicating Helicobacter pylori, with success rates exceeding 90% across different age and gender groups. Reported side effects were mild primarily bitter taste, diarrhea, and nausea and did not interfere with treatment completion. The treatment's effectiveness remained stable during long-term follow-up up to 24 weeks. These results suggest that the RA-RLT regimen holds strong potential as a suitable treatment option for patients with chronic gastritis infected with H. pylori.

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