

H. pylori Infection: The Importance of Acid Suppression in Eradication Therapy

Mini Review

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Abstract

H. Pylori infection is directly related to the increased prevalence of gastric cancer. With increasing antibiotic resistance, H pylori eradication rates are decreasing. The aim of this review is to analyze the importance of optimizing acid suppression in eradication treatment.

Keywords: H. Pylori infection; H pylori eradication; antibiotic-resistant; Importance of acid suppression

Introduction

Helicobacter pylori infection (H. pylori) is responsible for the third leading cause of cancer deaths in the world [1]. Infection usually acquired in childhood is more prevalent in developing countries. Epidemiological data show the prevalence of H. pylori are Africa (70.1%) and South America (69.4%) [2]. H.pylori , a gram-negative bacterium, is one of the common causes of chronic bacterial infections worldwide with a high potential for progression to serious diseases, including gastric cancer. As the prevalence of HP infection increases, so does the incidence of chronic gastritis, peptic ulcers, lymphoma (MALT) and gastric adenocarcinoma [3].

Treatment and Antibiotic-resistant

The treatment of the infection is based on a combination of antibiotics and still constitutes a great challenge for clinical physicians and gastroenterologists due to its complexity. Regimens for first-line, second-line therapy, and multiple treatment failures are recommended depending on antimicrobial resistance patterns in each region [4-6]. The emergence of antibiotic-resistant H. pylori strains has become a major difficulty that compromises the effectiveness of treatment results. According to the World Health Organization (WHO) currently resistance rates to clarithromycin, metronidazole and levofloxacin are

above 15%, except primary clarithromycin resistance in the Americas (10%) and Southeast Asia (10%) and primary Levofloxacin resistance in Europe (11%) [7]. This is the cutoff point that, when higher than this value, these antibiotics should not be used. Recent guidelines recommend 14-days combination therapies with two types of antibiotics, a proton pump inhibitor (PPI) and bismuth [6,8]. A recent study showed that the total eradication rate is 76.6% in regimens containing amoxicillin. Amoxicillin-containing regimens are superior to other regimens and have lower risks of therapeutic eradication failure [9].

Importance of Acid Suppression

Another issue is the importance of acid suppression in eradication treatment. The role of PPIs in the treatment of H. pylori infections is to increase gastric pH, leading to an increase in the dividing H. pylori population. consequently, the bacteria become more susceptible to antibiotics such as amoxicillin and clarithromycin [10].

A meta-analysis reported that regimens containing new-generation PPIs (esomeprazole or rabeprazole) showed greater efficacy in the eradication rate than those containing first-generation PPIs (omeprazole, lansoprazole, or pantoprazole) [11]. The decreasing rate of efficacy in addition to antibiotic resistance may be related to also they are partially influenced by the effectiveness of acid-suppressing drugs



[12]. Several factors can affect the success of anti-HP eradication therapy (adherence to treatment, smoking, altered immunity, hypersecretory states, high bacterial load, previous use of macrolides, and polymorphisms CYP2C19) [13-18]. Caucasian for example, are populations show elevated prevalence of high metabolizers than compared to Asian populations [19].

Regarding the issue related to the cytochrom CYP2C19, second-generation PPIs rabeprazole (R) and esomeprazole (E) are not so influenced by CYP2C19 and their use are recommended, based on the available evidence, R40bid and E40bid might be the optimum dosage to increase the cure rate [20]. Another option would be the use of competitive acid blockers (vonoprazan) of potassium (P-CABs), molecules that reversibly bind to K⁺ ions and, consequently, block acid secretion by inhibiting H⁺, K⁺-ATPase. These drugs have a rapid onset of action and reaches therapeutic levels after the first dose. PCABS are not affected by CYP2C19 [21,22].

Susceptibility Tests and Retreatment Limitations

The latest Maastricht VI guidelines 6 recommended routinely the application of the susceptibility tests (molecular or culture). However, in the vast majority of developing countries, these tests are not widely available. There are challenges to apply the retreatment, since Rifabutin is not available in many countries like Brazil [23], and even bismuth is still be difficult to a easy access. Thus, countries with a high prevalence of H pylori infection keep on being a subject to elevated risks of gastric cancer and complications related to this gastric infection.

Conclusion

We are experiencing a period of high rates of antibiotic resistance and the importance of acid suppression in the success of the treatment becomes a fundamental tool in the success of eradication. Individualized approaches to eradicating H. pylori in order to provide better access and effectiveness of eradication treatments is the best choice to improve the final results.

References

- Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, et al. (2021) Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 71(3): 209-249.
- Hooi JKY, Lai WY, Ng WK, et al. (2017) Global prevalence of Helicobacter pylori infection: systematic review and meta-analysis. *Gastroenterology* 153(2): 420-429.
- Marshall BJ, Warren JR (1984) Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration. *Lancet* 1 (8390): 1311-1315.
- Chey WD, Leontiadis GI, Howden CW, Moss SF (2017) ACG Clinical Guideline: Treatment Of Helicobacter pylori Infection. *Am J Gastroenterol* 112(2): 212-239.
- Mahachai V, Vilaichone RK, Pittayanon R, Rojborwonwitaya J, Leelakusolvong S, et al. (2018) Helicobacter pylori management in ASEAN: The Bangkok consensus report. *J Gastroenterol Hepatol* 33(1): 37-56.
- Malfetheriner P, Megraud F, Rokkas T, Gisbert JP, Liou JM, et al. (2022) Management of Helicobacter pylori infection: the Maastricht VI/Florence consensus report. *Gut* 71: 1724-1762.
- Savoldi A, Carrara E, Graham DY, Conti M, Tacconelli E (2018) Prevalence of antibiotic resistance in Helicobacter pylori: a systematic review and meta-analysis in World Health Organization regions. *Gastroenterology* 155(5): e17.
- Liu WZ, Xie Y, Lu H, Cheng H, Zeng ZR, et al. (2018) Chinese Society of Gastroenterology, Chinese Study Group on Helicobacter pylori and Peptic Ulcer. Fifth Chinese National Consensus Report on the management of Helicobacter pylori infection. *Helicobacter* 23(2): e12475.
- Tian-Lian Yan, Jian-Guo Gao, Jing-Hua Wang, Dan Chen, Chao Lu, et al. (2020) Current status of Helicobacter pylori eradication and risk factors for eradication failure. *World J Gastroenterol* 26(32): 4846-4856.
- Hu Y, Zhu Y, Lu NH (2017) Novel and Effective Therapeutic Regimens for Helicobacter pylori in an Era of Increasing Antibiotic Resistance. *Front Cell Infect Microbiol* 7: 168.
- Mc Nicholl AG, Linares PM, Nyssen OP, Calvet X, Gisbert JP (2012) Meta-analysis: esomeprazole or rabeprazole vs. first-generation pump inhibitors in the treatment of Helicobacter pylori infection. *Aliment Pharmacol Ther* 36: 414-425.
- Suzuki S, Gotoda T, Kusano C, Ikehara H, Ichijima R, et al. (2020) Seven-day vonoprazan and low-dose amoxicillin dual therapy as first-line Helicobacter pylori treatment: a multicentre randomised trial in Japan. *Gut* 69(6): 1019-1026.
- Lim SG, Park RW, Shin SJ, Yoon D, Kang JK, et al. (2016) The relationship between the failure to eradicate H. pylori and previous antibiotics use. *Dig Liver Dis* 48(4): 385-390.
- Megraud F, Coenen S, Versporten A, Kist M, Lopez-Brea M, et al. (2013) H. pylori resistance to antibiotics in Europe and its relationship to antibiotic consumption. *Gut* 62(1): 34-42.
- Padol S, Yuan T, Thabane M, Padol IT, Hunt RH (2006) The effect of CYP2C19 polymorphisms on H. pylori eradication rate in dual and triple first-line PPI therapies: a meta-analysis. *Am J Gastroenterol* 101(7): 1467-1475.
- Suzuki T, Matsuo K, Ito H, Sawaki A, Hirose K, et al. (2006) Smoking increases the treatment failure for H. pylori eradication. *Am J Med* 119(3): 217-24.
- Lee JY, Kim N, Kim MS, Choi YJ, Lee JW, et al. (2014) Factors affecting first-line triple therapy of H. pylori including Dig Dis Sci 59(6): 1235-43.
- Brouet N, Marais A, Lamouliatte H, de Mascarel A, Samoyeau R, et al. (2001) cagA status and eradication treatment outcome of anti-H. pylori triple therapies in patients with nonulcer dyspepsia. *J Clin Microbiol* 39(4): 1319-1322.
- Malfetheriner P, Megraud F, O'Morain CA, Gisbert JP, Kuipers EJ, et al. (2017) Management of Helicobacter pylori infection—The Maastricht V/Florence Consensus Report. *Gut* 66(1): 6-30.
- Yujiao Wang, Xiaosong Dai, Caiping Gao, Xue Yang (2023) Network meta-analysis of different dosages of esomeprazole and rabeprazole for the treatment of Helicobacter pylori, *Helicobacter* 28(2): e12948.
- Shah SC, Iyer PG, Moss SF. (2021) AGA Clinical practice update on the management of refractory Helicobacter pylori Infection: expert review. *Gastroenterology* 160(5): 1831-1841.
- Rokkas T, Gisbert JP, Malfetheriner P, Niv Y, Gasbarrini A, et al. (2021) Comparative effectiveness of multiple different first-line treatment regimens for Helicobacter pylori Infection: a network meta-analysis. *Gastroenterology* 161(2): e4.
- Coelho LGV, Marinho JR, Genta R, Ribeiro LT, Passos MCF, et al. (2018) IVth Brazilian Consensus Conference on Helicobacter pylori infection. *Arq Gastroenterol* 55(2):97-121.

