HHS Public Access

Author manuscript

Clin Gastroenterol Hepatol. Author manuscript; available in PMC 2019 December 16.

Published in final edited form as:

Clin Gastroenterol Hepatol. 2018 September ; 16(9): 1531–1532. doi:10.1016/j.cgh.2017.12.040.

Lessons from Using Culture-Guided Treatment after Referral for Multiple Treatment Failures for *Helicobacter pylori* Infection

Dimpal Bhakta, MD, **David Y. Graham, MD**, **Johanna Chan, MD**, **Hashem El-Serag, MD, MPH**

Section of Gastroenterology and Hepatology, Michael E DeBakey VA Medical Center and Baylor College of Medicine, Houston Texas

Introduction

Helicobacter pylori (*H. pylori*) is an important human pathogen thought to play a causative role in many gastrointestinal diseases including gastritis, peptic ulcer, and gastric cancer. The efficacy of the commonly recommended empirical combination therapies used in eradicating *H. pylori* has declined to the point that in most regions traditional empiric therapies are no longer effective [1]. Although there have been a number of recently published guidelines and recommendations for treating *H. pylori* [2–5], failures are still common [6]. Resistance to clarithromycin, metronidazole and fluoroquinolones are increasingly reported and are strongly associated with treatment failures. Culture-guided treatment is standard for infectious diseases where antimicrobial resistance is common as it allows therapy to be tailored to antimicrobial susceptibilities [7]. Susceptibility-based therapy is especially important to guide tailored treatment after failure of standard empirical therapies. However, the effectiveness of culture-guided and sensitivity based treatment of *H. pylori* in a referral setting in the United States is unknown.

Methods

This was a retrospective cohort study of patients referred following failure to eradicate *H. pylori* during 2011–2016 at the Baylor Clinic in Houston, Texas. We evaluated all patients with an esophagogastroduodenoscopy with gastric biopsies for histology and culture with susceptibility testing. One to two biopsy specimens were transported in saline containing tubes on ice to the *H. pylori* culture laboratory at the Michael E. DeBakey VA Medical Center. *H. pylori* infection was diagnosed by histology and confirmed by immunohistochemical staining. *H. pylori* was identified by culture when the oxidase, catalase, and urease reactions were positive. Susceptibility using E-test to clarithromycin, metronidazole, amoxicillin, and levofloxacin was assessed for all samples and tetracycline

Disclosures:

El-Serag, Dimpal and Chan: none

Dr. Graham is a consultant for RedHill Biopharma regarding novel *H. pylori* therapies and has received research support for culture of Helicobacter pylori and is the PI of an international study of the use of antimycobacterial therapy for Crohn's disease. He is also a consultant for BioGaia in relation to probiotic therapy for *H. pylori* infection and for Takeda in relation to *H. pylori* therapies.

susceptible was assessed for a subset of samples. *H. pylori* eradication was evaluated by urea breath test (UBT) or fecal antigen test (HpSAg) while off of proton pump inhibitors (PPI) for a minimum of two weeks. We evaluated patients and their outcomes as of May 20, 2017.

Results

We evaluated 49 referred patients who on average had 3.3 previous *H. pylori* treatments (range 1 to 12). Their mean age was 51 years, 41 (84%) were women, and their racial groups were 41% White, 31% Hispanic or Latino, 10% Black or African American, 6% Asian, 6% South Asian, and 6% declined to answer. No allergies to the antibiotics used in the treatment for *H. pylori* were reported in 30 (61%); 8 (16%) reported allergy to penicillin, 2 (4%) to clarithromycin, 1 (2%) to metronidazole, 1 (2%) to tetracycline and 7 (15%) to a combination of these antibiotics. The culture positivity of these 49 patients was only 82% (40 patients). Of these, 93% (n=37) were resistant to metronidazole, 88% (n=35) to clarithromycin, and 73% (n=29) to levofloxacin. No strain was resistant to amoxicillin. Tetracycline sensitivity was tested in 19 samples and only 1 strain (5%) obtained from a subject from the United States was resistant.

Following culture and allergy guided treatment; 24 patients (60%) were confirmed to achieve *H. pylori* eradication. Of the 24 participants, 17 (71%) received one course of treatment, 4 (17%) received two treatments and 3 (12%) received three treatments post culture ([dummy]Figure 1). The remaining 16 patients with positive *H. pylori* cultures, 5 (12%) failed the first course of treatment and are pending repeat testing after another course, while 11 (28%) were lost to follow up.

Discussion

Failure to eradicate *H. pylori* infection particularly after several attempts presents a difficult clinical scenario especially in the presence of patient refusal or drug allergy, which limits use of one or more antimicrobials. Clearly, the approach used here provided some cures (42.5% with the first regimen used) but overall the results were not very satisfactory. Lessons learned included the need to better coordinate with the culture laboratory to ensure availability of special transport media or the ability to freeze the sample in transport media until transport to the off site laboratory. Ideally, culture should be available on site. While it is challenging to separate the difficult infection (multiple resistances) from poorly adherent patient, it is difficult to achieve reliably high cure rates even in the presence of susceptibility testing. We suggest that the result of all *H. pylori* treatments are logged to provide feedback so that failure of therapy is identified early. After treatment failures, patients should probably be managed either by experts in the field or within a system that provides reliable feedback so that problems can be identified and corrected or the poorly performing regimen can be abandoned.

Acknowledgments

Support: Drs El-Serag and Graham are supported in part by the Office of Research and Development Medical Research Service Department of Veterans Affairs, Public Health Service grant DK56338 which funds the Texas Medical Center Digestive Diseases Center.

Reference List

1. Rimbara E, Fischbach LA, Graham DY. Optimal therapy *for Helicobacter pylori* infections. Nat Rev Gastroenterol Hepatol 2011;8:79–88. [PubMed: 21293508]
2. Chey WD, Leontiadis GI, Howden CW, Moss SF. ACG Clinical Guideline: Treatment of *Helicobacter pylori* infection. Am J Gastroenterol 2017;112:212–239. [PubMed: 28071659]
3. Malfertheiner P, Megraud F, O'Morain CA, et al. Management of *Helicobacter pylori* infection-the Maastricht V/Florence Consensus Report. Gut 2017;66:6–30. [PubMed: 27707777]
4. Fallone CA, Chiba N, van Zanten SV, et al. The Toronto Consensus for the treatment of *Helicobacter pylori* infection in adults. Gastroenterology 2016;151:51–69. [PubMed: 27102658]
5. Sugano K, Tack J, Kuipers EJ, et al. Kyoto global consensus report on *Helicobacter pylori* gastritis. Gut 2015;64:1353–1367. [PubMed: 26187502]
6. Shiotani A, Lu H, Dore MP, Graham DY. Treating *Helicobacter pylori* effectively while minimizing misuse of antibiotics. Cleve Clin J Med 2017;84:310–318. [PubMed: 28388387]
7. Leekha S, Terrell CL, Edson RS. General principles of antimicrobial therapy. Mayo Clin Proc 2011;86:156–167. [PubMed: 21282489]

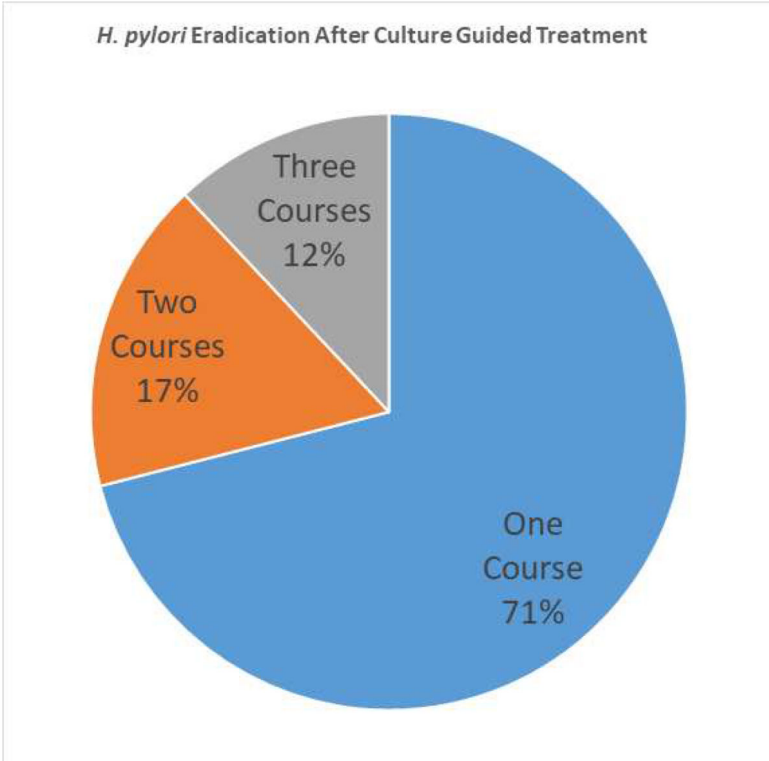

Figure 1.
The distribution of number of culture guided *H pylori* treatments required to achieve cure in 24 patients with multiple previous failed empiric treatments.