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Alisha Smith
Otterbein University, eddy1@otterbein.edu

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Helicobacter pylori Pathophysiology
Alisha Eddy-Smith BSN, SANE, RN
Otterbein University, Westerville, Ohio

Introduction
Helicobacter pylori is a Gram-negative, microaerophilic bacterium found in the human intestine. Several studies suggest that pathogens are transmitted as adolescents by fecal-oral, gastric aspirate, and oral transmission. Nearly 50% of the population worldwide carry H. pylori and develop associated disorders. The prevalence of H. pylori infection is a strong association to chronic disease, permanent damage, and death. A wide variety of factors have been responsible for the rise in gastric cancer incidence: A systematic review and meta-analysis. Gastrin 2015. 6:39. Doi: 10.1007/s11010-015-0129-z

Pathophysiology
Helicobacter pylori is a helical bacterium and has a cellular flagella which allows the bacteria to efficiently travel through the stomach mucosa. CagA damages the columnar epithelium of the intestines. Additionally, the exotoxin promotes inflammation by stimulating the production of IL-8 which attracts neutrophils. The inflammatory response results in gastritis. CagA is associated with adenocarcinoma and mucosa-associated lymphoid tissues.

This research studies the importance of adhering to the American College of Gastroenterology guidelines, to test, treat and review. Markel et al. (2017) examined physicians management of H. pylori. The research revealed that 50% of physicians prescribed eradication and 29% prescribed proton pump treatment eradication (Markel et al., 2017). Kim et al. (2014) peer-reviewed retrospective study to examine the rate of H. pylori testing on the hospital patient with confirmed bleeding ulcers. U.S. and international guidelines recommend H. pylori testing on patients with bleeding ulcers. Researchers conclude less than half of patients were tested for H. pylori in hospitalized patients with bleeding ulcers. Providers need to increase surveillance to prevent associated disorders and significant health complications for patients.

Significance of Pathophysiology
H. pylori virulence and chronic inflammation have enormous health consequences. Considering the research, health, and complications, providers have room to improve management and surveillance of the pathogens. Park et al. (2018) research aim to provide current evidence concerning the prevalence of H. pylori resistance to clarithromycin in the U.S. This quantitative research indicates >20% of H. pylori has developed resistance to Clarithromycin (MT 23 HRA). A mutation in 23S rRNA domain V was observed in 32.3% of cases (Park et al., 2016).

Case Study
Mr. Smith, a 61-year-old male presents to Urgent care with non-radiating intermittent epigastric pain, alleviated after eating and aggravated in the morning. Nausea, heartburn, recent unintentional weight loss of 5 lbs, in a month, decreased appetite. Patient reports history of ulcer disease and currently treating with proton pump inhibitor daily. Family history of gastric cancer.

Abdominal pain yields palpable bladder, active, soft, round, non-tender, no guarding, passing flatus, low bowel movement today formed. Mr. Smith is initiated on Zofran for nausea, will continue on current PPI, educated to consume 6 small meals daily, add Ensure protein drinks between meals as tolerated, and referred to a Gastroenterologist for further evaluation.

Evaluation
• Stomach biopsy is considered the gold standard, however the most invasive and expensive test for H. pylori.
• Blood antibody test measure H. pylori IgG specific antigens, with a sensitivity and specificity rate in 80-95%
• Urea breath test is the least invasive exam, with a specificity of 98% and sensitivity of 50-80%
• Stool antigen test is a non-invasive method for HpSA using an enzyme immunoassay.

Implications for Nursing Care
• Recognition, Diagnosis, and Surveillance: Advanced practice nurse is responsible for recognizing and diagnosing disease.
• Education: A diet plan low in sugar, fat, irritating foods, caffeine and alcohol. Adhering to medication. Reporting for eradication of the bacteria. Reteating if necessary to evaluate the patient.
• Medical Management: Amoxicillin Clarithromycin: Proton Pump Inhibitor Antacids.

References
Lim, M., Liao, J., Jeon, H., & Lam, L. (2014). CagA adherence to the American College of Gastroenterologist guidelines to test, treat, and review. These efforts to evaluate the pathogens will prevent chronic disease, permanent damage, and death.

Helicobacter Pylori
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Clinical Manifestations
Abdominal pain (ache or burning) aggravated by empty stomach
Fullness
Weight loss, decreased appetite
Vomiting
Heartburn
Shortness of breath
Hematemesis
Hemorrhoids
In deficiency anemia
Abdominal distension
Eruption (burning)

Risk factors
• Living in crowded conditions or a developing country
• Contaminated water or food sources
• Being in contact with sick, telluric, or blood on an infected person

In summary, H. pylori virulence is determined by the immune response, pathogen characteristics, and the host environmental conditions. With the widespread prevalence of this pathogen, providers must be alert to the harmful effects.

Providers are responsible for diagnosing disease, managing, and seeking out the source. A variety of disorders have a strong association to this pathogens. Providers must adhere to the American College of Gastroenterologist guidelines to test, treat, and review. These efforts to evaluate the pathogens will prevent chronic disease, permanent damage, and death.

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