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A Review on Helicobacter Pylori Infection

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Abstract: *Helicobacter pylori continues to be a major health problem worldwide, causing considerable morbidity and mortality due to peptic ulcer disease and gastric cancer.*
The burden of disease falls disproportionately on less well-resourced populations. As with most infectious diseases, the greatest impact on reducing this burden comes from improvements in socioeconomic status, which interrupt transmission. This has been observed in many regions of the world, but the prevalence of infection remains high in many regions in which improvements in living standards are slow to occur.
Meanwhile, the optimal clinical management and treatment pathways remain unsettled and are evolving with changing antimicrobial resistance patterns. Despite decades of research and clinical practice, major challenges remain. The quest for the most effective, safe, and simple therapy is still a major issue for clinicians. An effective vaccine also still appears to be elusive.

Keywords: H. Pylori, gastritis , peptic ulcer, GERD

I. INTRODUCTION

The most common bacterial infection in the world is H. pylori, which first manifested in humans in East Africa, 58000 years ago. H. pylori was introduced in 1982, by Warren and Marshall, in cases with chronic gastritis and peptic ulcers. In 1994, the World Health Organization (WHO) considered H. pylori as a causative agent for gastric cancer. H. pylori is a spiral-shaped, Gram-negative bacillus, which is more prevalent in developing countries than in developed ones. It has two to six flagella, enabling it to survive during gastric contractions. The human stomach, especially the antrum, is the most common reservoir of this agent. As this bacterium could produce urease, it could survive in the acidic stomach environment.

II. TRANSMISSION OF INFECTION

Oral-oral transmission

- Close personal contact, such as sharing utensils, can contribute to the spread of H. pylori.
- The bacterium may be present in the saliva of infected individuals.
- Preventive measures include good oral hygiene and avoiding saliva exchange.
- Understanding this mode of transmission is essential for developing strategies to minimize H. pylori spread.

Fecal-Oral Transmission

- Contaminated water and food are potential sources of H. pylori transmission.
- Poor sanitation and hygiene practices, especially in developing countries, may contribute to the fecal-oral route of transmission.

Person-to-Person Contact

- Direct contact with an infected person, particularly in households or other close living quarters, can facilitate the transfer of H. pylori.
- This is especially relevant in crowded or densely populated settings.
- Preventive measures include maintaining good personal hygiene, avoiding intimate contact with infected individuals, and addressing risk factors associated with the transmission of H. pylori.

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Vertical Transmission

- Definition: Vertical transmission refers to the transfer of H. pylori from an infected mother to her child, either during childbirth or through close contact in early childhood.
- During Childbirth: The bacterium can be transmitted from an infected mother to her newborn during the birthing process, potentially through exposure to maternal fluids or contact with the birth canal.

III. CLINICAL MANIFESTATION OF H.PYLORI

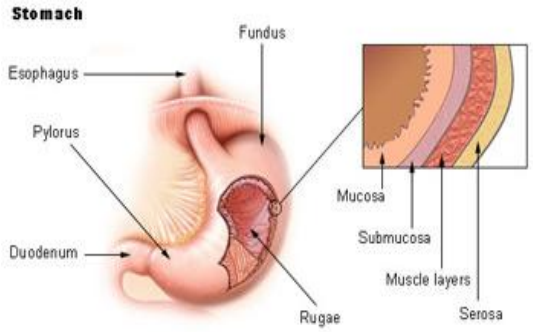
a. Asymptomatic Infection

- Asymptomatic Helicobacter pylori (H. pylori) infection refers to the presence of the bacterium in the stomach without causing noticeable signs or symptoms.
- Many carriers may not experience immediate health issues, but long-term infection is associated with an increased risk of conditions such as peptic ulcers and gastritis.
- Detection often requires specific diagnostic tests, and the decision to treat depends on factors like overall health and potential complications.
- Asymptomatic carriers can still transmit H. pylori to others through person-to-person contact.

b. Gastritis

- Gastritis is the inflammation of the stomach lining. It can be caused by various factors such as infection (commonly H. pylori), chronic use of certain medications, excessive alcohol consumption, or autoimmune conditions.
- Symptoms may include stomach pain, nausea, vomiting, and loss of appetite. Gastritis can be acute or chronic and is diagnosed through endoscopy or other imaging tests.
- Treatment involves addressing the underlying cause, medications to reduce stomach acid, and lifestyle changes.

Severe cases may lead to complications like ulcers.



c. Peptic ulcer

- Peptic ulcer is a sore or lesion that forms on the lining of the stomach, the lower part of the esophagus, or the upper part of the small intestine.
- Common causes include infection with H. pylori bacteria, long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs), and excess stomach acid.
- Symptoms include burning stomach pain, bloating, nausea, and vomiting.
- Diagnosis involves endoscopy.
- Treatment includes medications to reduce stomach acid, antibiotics for H. pylori, and lifestyle changes.
- Complications may include bleeding or perforation, requiring prompt medical attention.

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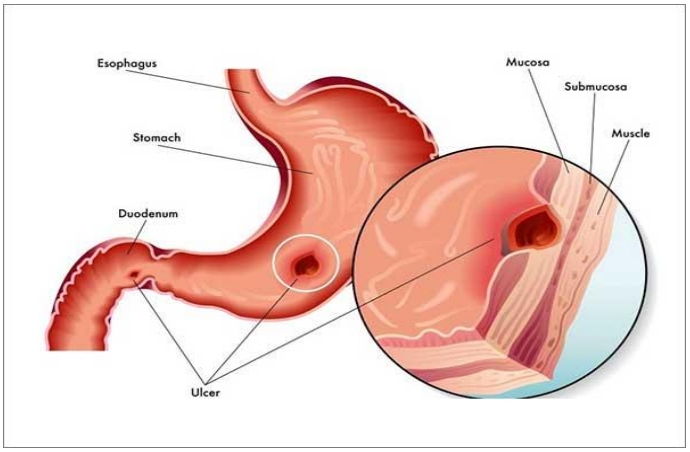
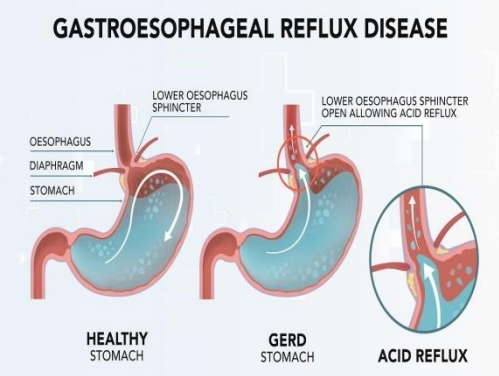


d. GERD, or Gastroesophageal Reflux Disease

- GERD, or Gastroesophageal Reflux Disease, is a chronic condition where stomach acid frequently flows back into the esophagus, causing symptoms like heartburn, regurgitation, and chest pain.
- GERD occurs when the lower esophageal sphincter (LES), a muscular ring that separates the esophagus from the stomach, weakens or relaxes inappropriately, allowing stomach acid to flow back into the esophagus.
- GERD can lead to complications like esophagitis, Barrett's esophagus, and an increased risk of esophageal cancer if left untreated.



IV. DIAGNOSIS

The diagnosis of Helicobacter pylori (H. pylori) infection can be made through various methods, depending on the patient's symptoms and the available resources. Common diagnostic approaches include:

4.1 Non-Invasive Tests

- **Urea Breath Test (UBT):** The patient ingests a special substance containing urea labeled with a radioactive or non-radioactive marker. If H. pylori is present, it produces an enzyme that breaks down urea, releasing the marker, which can be detected in the breath.
- **Stool Antigen Test:** This test detects H. pylori antigens in the patient's stool. It is a non-invasive and simple method, often used in children and when other tests are not feasible.

4.2 Blood Tests

- **Serology:** Blood tests can detect antibodies produced by the immune system in response to H. pylori infection. While convenient, serology may not distinguish between current and past infections and may remain positive even after successful treatment.

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4.3 Invasive Tests

- **Endoscopy with Biopsy:** During an upper endoscopy, a thin, flexible tube with a camera is inserted into the digestive tract. Tissue samples (biopsies) are taken from the stomach lining for examination. This method allows direct visualization of the stomach and provides information about the severity of inflammation and the presence of ulcers.
- **Rapid Urease Test (RUT):** Biopsy samples taken during **endoscopy** can be tested for **urease activity**. H. pylori produces urease, and the test detects the enzyme's presence.

4.4 PCR (Polymerase Chain Reaction):

Molecular tests like PCR can detect **the genetic material of H. pylori** in biopsy samples. These tests are highly sensitive and specific.

V. TREATMENT

Type	Duration	Efficiency
First line		
Standard triple therapy:		
PPI + two antibiotics (clarithromycin + metronidazile or amoxicilin)	7–14 days	70–85%
Second line		
Bismuth-containing quadruple therapy:		
PPI + bismuth salt + tetracycline + metronidazole	14 days	77–93%
Non-bismuth based concomitant therapy:		
PPI + clarithromycin + amoxicillin + metronidazole	14 days	75–90%
Levofloxacin triple therapy:		
PPI + amoxicillin + levofloxacin	14 days	74–81%
Salvage regimens		
Rifabutin-based triple therapy:		
PPI + rifabutin + amoxicillin	10 days	66–70%

REFERENCES

[1]. Linz B, Balloux F, Moodley Y, et al. An African origin for the intimate association between humans and Helicobacter pylori. *Nature.* 2007;7130:915. [PMC free article] [PubMed] [Google Scholar]

[2]. Warren JR, Marshall B. Unidentified curved bacilli on gastric epithelium in active chronic gastritis. *The Lancet.* 1983;8336:1273–1275. [PubMed] [Google Scholar]

[3]. Marshall B, Warren JR. Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration. *The Lancet.* 1984;8390:1311–1315. [PubMed] [Google Scholar]

[4]. Peterson WL. Helicobacter pylori and peptic ulcer disease. *N Engl J Med.* 1991;15:1043–1048. [PubMed] [Google Scholar]

[5]. Blaser MJ, Berg DE.Helicobacter pylori genetic diversity and risk of human disease. *The Journal of Clinical Investigation.* 2001;7:767–773. [PMC free article] [PubMed] [Google Scholar]

[6]. Iwańczak B, Buchner AM, Iwańczak F. Clinical differences of Helicobacter pylori infection in children. *Advances in clinical and experimental medicine: official organ of Wroclaw Medical University.* 2017;7:1131–1136. [PubMed] [Google Scholar]

[7]. Salih KM, Elfaki OA, Hamid YH, et al. Prevalence of Helicobacter Pylori among Sudanese children admitted to a specialized children hospital. *Sudanese Journal of Paediatrics.* 2017;1:14. [PMC free article] [PubMed] [Google Scholar]

[8]. Brown LM. Helicobacter pylori: epidemiology and routes of transmission. *Epidemiologic Reviews.* 2000;2:283–297. [PubMed] [Google Scholar]

[9]. Moriai T, Hirahara N. Clinical course of acute gastric mucosal lesions caused by acute infection with Helicobacter pylori. *N Engl J Med.* 1999;6:456–457. [PubMed] [Google Scholar].

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[10]. Schwarz S, Morelli G, Kusecek B, Manica A, Balloux F, Owen R.J, Graham D.Y, van der M.S, Achtman M, Suerbaum S. Horizontal versus familial transmission of H. Pylori. *PLoS Pathogens.* 2008;4:el 000180. [PMC free article] [PubMed] [Google Scholar]

[11]. Burgers R, Schneider-Brachert W, Reischl U, Behr A, Hiller KA, Lehn N, Schmalz G, Ruhl S. H. Pylori in human oral cavity and stomach. *Eur. J. Oral. Sci.* 2008;116:297–304. [PubMed] [Google Scholar]

[12]. 12Gebara EC, Faria CM, Pannuti C, Chehter L, Mayer MP, Lima LA. Persistence of H. Pylori in the oral cavity after systemic eradication therapy. *I Clin.Periodont.* 2006;33:329–333. [PubMed] [Google Scholar]

[13]. Gisbert JP, Arata IG, Boixeda D, Barba M, Canton R, Plaza AG, Pajares JM. Role of partner's infection in reinfection after H. Pylori eradication.Easy. *Gastroenterol.flepatol.* 2002;14:865–871. [PubMed] [Google Scholar]