



Helicobacter Pylori (HP)

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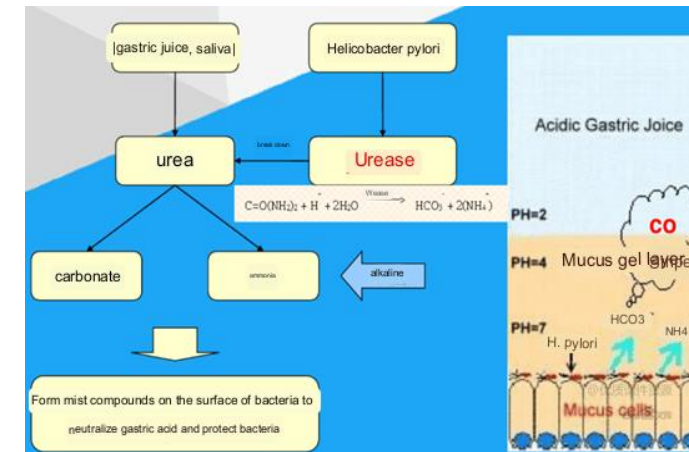
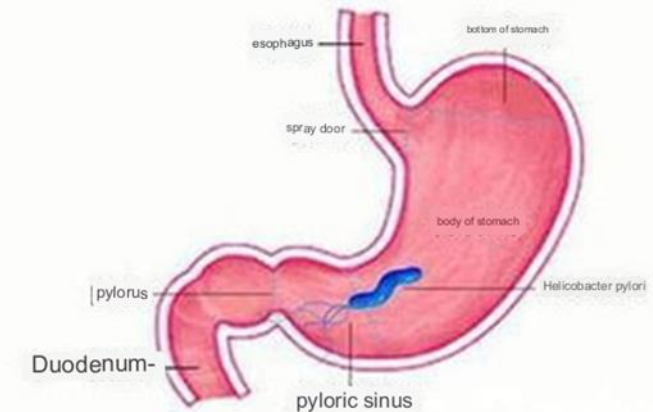
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a. Biological Properties of Helicobacter

- ❑ Helicobacter species belong to the family Helicobacteraceae. It was first discovered in the stomach of cats by Rappin et al. in 1881 [1], then it was successively reported that the spiral bacteria was found in dogs, rats, monkeys and other animals. At present, H. pylori has been confirmed to be closely related to the occurrence of gastrointestinal and liver diseases in humans and animals, and is the pathogenic bacteria of zoonotic diseases. Studies have shown that dogs, cats and animal owners can infect each other with H. pylori, and the mutual infection rate can reach up to 100%. Most cats infected with H. pylori show no obvious clinical symptoms.
- ❑ Dogs and cats are in close contact with humans, which is the source of human H. pylori infection. H. felis, H. bizzozeronii, H. heilmannii sensu stricto (s.s) and H. pylori are the main Helicobacter species in the stomach of dogs and cats. Mixed infections occur frequently. To date, at least 40 species of Helicobacter have been isolated and reported. Spiral-shaped bacteria are more common in the stomach of dogs. The infection rate is 67% - 86% in clinically healthy dogs and 61% - 100% in dogs with chronic vomiting symptoms. The infection rate of spiral bacteria in clinically healthy cats is 41% - 100% and the infection rate of cats with chronic vomiting symptoms is 57% - 100%.

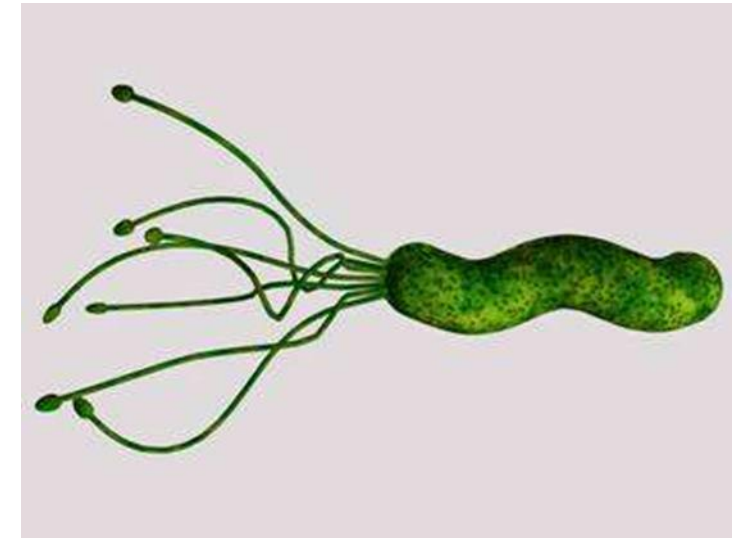
a. Biological Properties of Helicobacter

- ❑ Helicobacter bacteria are Gram-negative bacteria that grow micro aerobically or anaerobically at 35 - 42°C.
 - ❑ Mainly grows in gastric mucosa and submucosa.
 - ❑ Helicobacter pylori is rich in urease, which hydrolyses urea to produce ammonia and carbon dioxide, and forms an 'ammonia cloud' alkaline microenvironment around the bacteria to resist the killing effect of gastric acid.
 - ❑ HP strains isolated from human gastric biopsy specimens have diverse gene phenotypes, which can be divided into two types:
 - Type I – Has cytotoxicity-associated gene A (cytotoxin associated gene A, CagA), expresses CagA protein and vacuolating toxin (vacuolating toxin) cytotoxin A, Vac A)
 - Type II – Has no CagA and neither expresses CagA protein.
- It is now believed that Type I is more closely related to gastric diseases.



a. Pathogenic Principle

- ❑ HP enters the low pH environment in the human stomach and can grow, reproduce, and cause tissue damage. Inflammatory and immune responses.
- ❑ Fixed Value of HP – The natural colonisation site of HP is mainly on the epithelial surface of gastric mucosa and the bottom layer of gastric mucus. By producing urease, urea can be decomposed into ammonia and carbon dioxide. Ammonia forms an ‘ammonia cloud’ around HP to neutralise gastric acid protection.
- ❑ Damage to Gastric and Duodenal Mucosa – HP toxins (VacA and CagA cause vacuolar degeneration of epithelial cells), toxic enzymes (urease can produce cytotoxicity in addition to protecting the fixed value of HP) and HP-induced mucosal inflammation (inducing the expression and secretion of inflammatory factors in gastric epithelial cells and neutrophils) can cause damage to the gastric and duodenal mucosal barriers.



a. Ways of Spreading

Infection Characteristics – Universal, Contagious, Concealed

- Mouth-to-mouth transmission
- Faecal-Oral Transmission – HP can contaminate water sources with faeces and cause faecal-oral transmission
- Gastric-Oral Transmission – It mainly occurs in young children because young children often have vomiting and gastroesophageal reflux, and vomit or gastroesophageal reflux may cause gastric-oral transmission of HP
- Others – A small number of patients may be transmitted by pets, flies and insects. Nosocomial infection caused by lax disinfection of gastroscopes

b. Clinical Symptoms of Helicobacter

- ❑ Gastrointestinal Symptoms – Indigestion, chronic loss of appetite, acid reflux, vomiting, back pain, diarrhoea
- ❑ Oral Symptoms – Bad breath (H. pylori colonises plaque bacteria in the mouth), perioralitis, thickened tongue coating, dry oral mucosa
- ❑ Others – Prone to fatigue, prone to lying down, not active etc.

b. Closely Related Diseases

- Acute/chronic gastritis
- Peptic ulcer
- Mucosa-associated lymphoid tissue lymphoma
- Stomach cancer
- Periodontitis

Reference – Identification of Helicobacter and Wolinella spp. In Oral Cavity of Toy Breed Dogs With Periodontal Disease

c. How is HP Infection Diagnosed?

Diagnostic Methods for Helicobacter – Invasive and Non-Invasive

- ❑ Invasive Detection Methods – Histopathological section staining, rapid enzymatic test (RUT), isolation and culture, immunohistochemistry, electron microscopy or PCR etc. need to collect gastric tissue samples
- ❑ Non-Invasive Methods – Collection of blood, exhaled breath, faeces, urine or saliva, etc. These samples can be tested for serology or urea breath test (UBT) and stool antigen detection

Stool Antigen Testing

This method is safe and simple, does not need to rely on endoscope, is suitable for all patient groups, and its accuracy is comparable to that of urea breath test. suitable for pediatric patients

Due to the complex composition of feces, there will be cross-reactivity, so the requirements for the quality of the kit antibody are high. In addition, the reliability of the results is affected by a variety of clinical drugs, such as proton pump inhibitors, bismuth or antibiotics, which will reduce the quality of the antibody. Sensitivity of the assay, in addition, patients may feel self-conscious when submitting a stool sample

For pets, use faecal antigen testing

c. How is HP Infection Treated?

40-70% of animals have such bacteria, what kind of conditions need treatment?

- Peptic ulcer (gastric ulcer, 12 duodenal ulcer, whether active or static, with or without complications), low-grade gastric mucosa-associated lymphoid tissue lymphoma and early gastric cancer are all indications for eradication after surgery
- Gastritis with obvious abnormalities (erosion, atrophy, intestinal metaplasia, dysplasia) can support the eradication of HP

References

- [5] Wang Xueping. Epidemiological investigation of canine *Helicobacter pylori* infection in Nanjing and research on the effect of probiotics on its control [D]. Nanjing Agricultural University, 2016.
- [6] Selection of *Helicobacter pylori* detection method and its laboratory diagnosis path
- [7] Identification of *Helicobacter* and *Wolinella* spp. In Oral Cavity of Toy Breed Dogs With Periodontal Disease



Helicobacter Pylori (HP) Rapid Quantitative Test

Woodley have developed a rapid, accurate, reliable and highly sensitive detection method for HP in cats and dogs.

The InSight V-IA Helicobacter Pylori (HP) Rapid Quantitative Test is a fluorescence immunoassay used with the InSight V-IA Veterinary Immunoassay Analyser for the quantitative determination of canine or feline HP in canine or feline faeces.

It can be stored at room temperature.





Thank You