

Lecture no 9

Helicobacter pylori (H. pylori)

Cause Gastritis. H. pylori has morphologic and growth similarities to the campylobacters. The cell is slender, another curved rod, with motile polar flagellae. The cell wall structure is typical of other Gram negative bacteria, although H. pylori LPS may be less toxic than its enteric counterparts. Growth requires a microaerophilic atmosphere and is slow 3 to 5 days urease positive whose action allows the organisms to persist in lowly the generation, of ammonia. Another secreted protein called the vacuolating cytotoxin (VACA) causes apoptosis in eukaryotic cells it enters generating multiple large cytoplasmic vacuoles.

Pathogenesis

Multiple mechanisms to adhere to the gastric mucosa and survive the acid milieu of the stomach. Motility provided by the flagella allows the organisms to swim to the less acid pH locale beneath the gastric mucosa, where the urease forms a more neutral microenvironment by ammonia production. At the mucosa adherence is mediated by surface protein one of which binds to Lewis blood group antigen, present on the surface of gastric epithelial cells. A prolonged and aggressive inflammatory response could lead to epithelial cell death and ulcer.

Diagnosis

The most sensitive means of diagnosis, with biopsy and culture of the gastric mucosa. The H. pylori

Urease is so potent its activity can be directly demonstrated in biopsies in less than an hour. No

Invasive methods include serology and urea breath test. For breath test, the patients ingest C13 or C14 – labeled urea, from which the urease in the stomach produces products that appear labeled O₂ in the breath. A number of methods for detection of antibody directed against H. pylori are non available. Because IgG or IgA remain elevated as long as the infection persists.

Treatment

Urease test

Preemptive diagnosis at the time of endoscopy is the biopsy urease test, in which ground biopsy material is added to Christensen's urea broth, providing a strong shift in pH to alkalinity and rapid color change if large number of H. pylori are present.