Introduction
INTRODUCTION

Peptic ulcers are most often solitary chronic lesions that occur at any level of GI tract exposed to aggressive action of acid peptic juices or a decrease in the mucosal resistance.

An ulcer is defined as a persistent discontinuity of an epithelial surface that can occur in skin or mucus membrane. Peptic ulcers are so common in industrialized nation that they virtually represent stigma of civilization.

Perforation is one of the most catastrophic complications of peptic ulcer. In spite of modern advances in surgical, anesthetic and ancillary facilities, it still assumes life-threatening dimensions. Prompt recognition of the condition is of paramount importance, as only by early diagnosis and treatment it is possible to reduce the still relatively high mortality.

Approximately 98-99% of peptic ulcers either in duodenum or in stomach in ration of 4:1. Duodenal ulcer is
the most common ulcer in the GI tract. Free perforation into the peritoneal cavity occurs in 2-3%. Perforation of duodenal ulcer is an emergency condition, which requires immediate surgical intervention. Peptic ulcers are remitting and relapsing lesions that are often diagnosed in middle aged to older adults (45 yrs. and above). 5-10% of patients have no recognizable prior ulcer symptoms and may appear after a period of weeks of months of active disease and heal with or without therapy. Thus it is difficult to express accurate data about frequency of active disease. The best estimate of peptic ulcer frequency is from autopsy studies and surveys of patients indicate a range of 6.14% for men and 2.6 for women. Perforation is one of the most dramatic complication of duodenal ulcer and perforated duodenal ulcer is most common perforation of upper GI tract. Ulcer that perforate mostly present on anterior aspect of first part of duodenum, rarely an ulcer is present in posterior wall and perforates in lesser sac and adjacent structures, most
often in pancreas, less commonly into liver, biliary tract or colon.

It is silent chronic ulcer that perforates specially in patients who are being treated with steroids, usually symptoms of perforation occur with dramatic suddenness.

After perforation duodenal contents escape through the perforation into general peritoneal cavity resulting into the peritoneal reaction (Peritonism). Peritoneum reacts to this chemical irritation by secreting peritoneal perforation fluid copiously, which dilutes the contents, and this gives relief of pain for short time. This stage lasts for 3-6 hrs and is followed by diffused bacterial peritonitis.

Bacterial peritonitis develops late as there is sufficient acid from the stomach. If this condition is not treated immediately, the course is fatal. Patients die because of septicemia and peripheral vascular failure.

Peptic ulcer disease—including gastric and duodenal ulcers—has long been treated as a gastric acid secretion and disorder of the upper gastrointestinal tract. Despite the
discovery of the involvement of the microbe H. pylori in peptic ulcer disease and gastric cancer, prescribers have been slow to add antimicrobials to peptic ulcer disease therapy. In a 1995 British study, only 25% of gastroenterologists used anti-H. pylori therapy as a first-line treatment of duodenal ulcer patients. Most practitioners did not believe that the microbe was associated with gastric ulcers or gastric cancers. However, recent pharmacotherapeutic advances in treating peptic ulcer disease-histamine H2 antagonists, antisecretory compound, cytoprotective agents, and anti-infective therapy-having virtually eliminated the need for surgery in these patients.

**EPIDEMIOLOGY AND ETIOLOGY**

After its isolation from gastric mucosa in 1983, H. pylori (originally misclassified as Campylobacter pylori) is a gram-negative, spiral-shaped bacterium capable of swimming or burrowing through gastric mucus. Once in the mucosal layer, where the pH approaches neutral, H. pylori
colonizes between the epithelial cell and the mucosal layer. It produces abundant urease, which hydrolyzes urea into ammonia and water. This causes localized inflammation, resulting in cytokine production.

The four to six sheathed flagella permit motility. The microbe uses urease to convert urea to ammonia and bicarbonate, tempering the acidic environment of the stomach in its immediate area.

H. pylori infections occur in some 50% of the elderly, with marked regional differences found in the United States—highest in northeast, lowest in South and West. African-Americans and Hispanics have a higher incidence that do whites, and lower levels of income, education, and socioeconomic status are associated with increased prevalence. The prevalence of H. pylori infection was reported as 43-78% in a 1995 review article that cited five prior studies. It notes that prospective serologic studies have found prevalence of 69-95% among patients with gastric cancer and 47-76% among control patients. Infected
individually have a lifetime risk of 10-20% for developing peptic ulcer disease. Transmission likely occurs through fecal-oral contamination and the oral-oral route, and prevalence varies with water sources. A zoonotic link has been proposed based on isolation of similar organisms in commercially reared cats and infection of pet owners with gastric Helicobacter-like organisms. As many as 90% of duodenal ulcer disease patients test positive for H. pylori infection. While gastric acid and the other classic factors contributing to peptic ulcer disease are still believed to play a role, H. pylori is now considered the causative factor for peptic ulcer disease and its recurrence as well as gastric cancer.

The gold standard for diagnosis of H. pylori infection has been biopsy-obtained during endoscopy-followed by testing for urease and/or histologic staining with hematoxylin and eosin. However, no single test has yet emerged as definitive in daily clinical practice for several reasons.
Endoscopy-based techniques carry the risks inherent in that procedure and are expensive. Cultures – which would establish an H. pylori diagnosis beyond doubt-are difficult, expensive, and require seven days for results.

Histologic staining adds substantially to costs, but is viewed as worthwhile when added to a procedure as expensive as endoscopy. Urease testing of biopsy samples is common, inexpensive, and accurate. Among the noninvasive breath tests, serology is an option. It fails to differentiate between past and active infection, and thus it does not provide definitive support for initiation of therapy.

An FDA advisory committee has recommended the 14C-labeled urease breath tests for marketing, and agency action in imminent. The urease test is specific for current H. pylori activity, provides results in 20 minutes, and may be used in physician offices. It is expected to provide an alternative to endoscopy in many patients.

The breath test involves patients' ingestion of a capsule containing 1µCi of [14C] urea (Tri-Med Specialties,
Charlottesville, Virginia). Twenty minutes later, the presence of radioactive carbon dioxide in the breath indicates H. pylori activity in the stomach.

Another noninvasive test now under study is an office-based serum test for anti-H. pylori antibodies (FlexSure HP, Smithkline Diagnostic, Islip, New York). Results on venipuncture samples are available in four minutes. Its usefulness is limited to patients’ first diagnosis of infection, though, since it does not differentiate between active and past infection.

Three equally reasonable diagnosis and treatment protocols exist. A single, short-term trial of empiric antiulcer therapy using antisecretory agents, without proven H. pylori infection.

Definitive diagnostic evaluation, which should be aggressive in patients over 50 years old because of the link between H. pylori infection and gastric carcinoma.
Noninvasive testing for H. pylori followed by antibiotic therapy in positive subjects (this option includes dyspeptic patients without peptic ulcer disease).

**Epidemiology**

H. pylori infects more than half of the population worldwide. Most individual infected are asymptomatic. The incidence is lower in development countries and there is an inverse relationship between prevalence and socioeconomic status. It is more prevalent in older adults. Transmission is probably from man to via faecal-oral or oral-oral routes. It has been demonstrated that iatrogenic spread can occur through contaminated endoscopes.

**Diagnosis**

Tests for H. pylori are divided into invasive and non-invasive test depending on whether endoscopy is required. The serological tests measure specific H. pylori antibodies. A number of such tests are available commercially, the sensitivity and specificity of which vary considerably. Local
validation of the tests are desirable. Because the antibodies to H. pylori persist for a long time after H. pylori eradication, the serological tests are not recommended for documentation of success of H. pylori eradication. Another non-invasive test is the urea breath test. The patient is given either 13C or 14C-labeled urea to drink. The urease produced by H. pylori will metabolized the urea rapidly to ammonia and carbon dioxide which will be absorbed and then exhaled. The amount of labeled carbon in the expired air will be able to determine whether H. pylori is present, it is a very accurate method but is relatively expensive. It is reliable method to assess the H. pylori status after treatment.

The invasive tests require upper endoscopy and biopsy of the gastric mucosa. Histological identification of H. pylori has long been considered the gold standard of diagnostic tests. However, it is time consuming and expensive. Histology is generally unnecessary in patients in whom a biopsy urease test is positive. The biopsy urease
test is a colorimetric test based on the urease-producing ability of H. pylori. It is quick and accurate. When upper endoscopy is indicated, it is the test of first choice. Culture of biopsy specimens for H. pylori requires an experienced laboratory and is both time-consuming and expensive. It is only indicated when antimicrobial sensitivity testing is required.

Peptic ulcer disease Current scientific evidence points to a strong association between H. pylori and peptic ulcer disease. Cure of the infection results in a market reduction in ulcer recurrence. Permanent cure of the peptic ulcer can be achieved. Therefore it is recommended that all gastric and duodenal ulcer patients who are infected with H. pylori should be given eradication therapy whether the ulcer is active or in a remission. This also applies to patients with a history of ulcer bleeding or perforation. In complicated peptic ulcer disease, eradication of H. pylori should be confirmed. If available, the urea breath test is the ideal test to demonstrate H. pylori eradication.