CHAPTER I

INTRODUCTION AND AIM OF THE WORK

Helicobacter pylori (*H. pylori*), formerly *Campylobacter pylori* was first isolated from gastric mucosa by ***Warren and Marshall in 1983***. It is Gram's negative, microaerophilic bacterium with the ability to colonize in the gastric epithelium and rarely associated with other tissues of human body ***(Soltesz et al., 1992)***. It has been reported that *H. pylori* is associated with most cases of chronic gastric cancer ***(Cover et al., 1992)***. The exact cause of peptic ulcer disease is still unknown. However, *H. pylori* may set the peptic ulcer disease by causing antral gastritis which creates fertile soil for the action of smoking, alcohol, stress and other ulcerogenic factors ***(Taylor et al., 1991)***. ***Labenz and Borsch, (1994)***, stated that eradication of *H. pylori* speeds up ulcer healing. So, detection of *H. pylori* infection is of great importance as anti *H. pylori* therapy might offer a potential tool in the treatment of gastritis and peptic ulcer. A variety of highly sensitive and specific diagnostic methods have been developed over the past few years to establish whether a patient is infected with this organism or not. Two major categories of diagnostic tests for *H. pylori* are invasive methods, which require upper gastrointestinal endoscopy for the collection of biopsy specimens and non-invasive techniques in which endoscopy is not necessary ***(Dunn et al., 1997a)***. Invasive diagnostic tests include: rapid urease test, histopathological examination, touch cytology, broad antral cytological brushing, culture and use of polymerase chain reaction (PCR) for the demonstration of *H. pylori* in biopsy specimens. Because of the patchy nature of the infection these tissue based tests may suffer from sampling error ***(Vaira et al., 1999)***. Non-invasive diagnostic methods are

fecal diagnosis, dental plaques, sputum, saliva diagnosis, serology (which detects an immune response in the patient's serum), ^{13}C or ^{14}C labeled CO_2 in expired air as a result of *H. pylori* urease activity and stool antigen test (HpSA) [a micro well-based enzyme immuno-assay (EIA)] for detection of *H. pylori* stool antigens. There is unequivocal evidence that the urea breath test (UBT) is an acceptable test for primary care use. It detects active, on ongoing infection and can be used to evaluate the efficacy of the therapy just a few weeks after stopping treatment. However, it is rather expensive, require specialized test equipment and in the case of ^{14}C UBT, the radioactivity requires specific handling, storage precautions and therefore requires a laboratory/office visit by the patient ***(Vaira et al., 2000 and Rajuet et al., 1994)***. On the other hand, the HpSA is rather expensive and would cross-react with antigens of other strains of *Helicobacter* that may colonize in humans such as *Helicobacter heilmannii* and *Helicobacter rullorum*, given *H. pylori*–specific response in the HpSA test ***(Andersen and Espersen, 1999)*.**

The serological diagnosis is based the detection of *H. pylori* specific antibodies which are developed as a result of infection of the gastric mucosa with the organism in systematic as well as local immune responses ***(Taylor and Parsonnet, 1995)***.

Many investigators tried to identify *H. pylori* in faeces, either by using DNA amplification techniques ***(Mapstone et al., 1993)*** or by culturing fresh stool specimens. The main application of faecal diagnosis technique is to identify individuals or groups within a given population who may be excreting large amounts of viable bacteria in their faeces and

may thus be key individuals in the transmission of *H. pylori* through a faecal-oral route. All studies from different parts of the world report a high sensitivity and specificity for primary diagnosis (80 - 100% and 83 - 100% respectively) ***(Ohkura et al., 2000)***.

H. pylori has been cultured from dental plaques ***(Krajden et al., 1989)***, saliva and sputum ***(Ferguson et al., 1993)***.

The aim of the present study is differentiation between *Helicobacter pylori* strains which isolated from stool, dental plaque and sputum of gastric disorder patients by using SDS-PAGE and make the Antibiotic sensitivity test for treatment as the follow:

1. Isolation and identification of *H. pylori* from human biological specimens (stool, sputum and dental plaque) using microbiological techniques.
2. Determination of *H. pylori* infection in patients suffering from symptomatic, signs gastritis and gastric ulcer by using Sodium Dodecyl Sulphate–Polyacrylamide Gel Electrophoresis (SDS-PAGE).
3. Identified *H. pylori* isolates were tested for its antibiotic sensitivity using fourteen different antibiotics.
4. Relationship between *H. pylori* infection and age.
5. Relationship between *H. pylori* infection and sex.