

PREVALENCE OF HELICOBACTER PYLORI
AMONG HEALTH CARE WORKERS IN
ENDOSCOPY UNITS

Thesis

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List of Abbreviation

AER	<i>Automated Endoscopic Reprocessing</i>
ASGE	<i>The American Society for Gastrointestinal Endoscopy</i>
ATD	<i>Autoimmune thyroid disease</i>
BABA	<i>Blood group antigen binding adhesion</i>
BL	<i>Burkitt's lymphoma</i>
BSGE	<i>British Society of Gastroenterology Endoscopy Committee</i>
CAG A	<i>Cytotoxin associated gene A</i>
CLO	<i>Campylobacter-like organism test</i>
CRP	<i>C reactive protien</i>
CSX	<i>Cardiac syndrome X</i>
DM	<i>Diabetes mellitus</i>
EIA	<i>Enzyme immunoassay</i>
ERCP	<i>Endoscopic retrograde cholangiobancreatography</i>
ESGE	<i>European Society of Gastrointestinal Endoscopy</i>
ESGENA	<i>The European Society of Gastroenterology and Endoscopy nurses and associates</i>
FDA	<i>Food and drug administration</i>
GERD	<i>Gastrosoephagaol reflux disease</i>
HBV	<i>Hepatitis B virus</i>
HCW	<i>Health care worker</i>
HCV	<i>Hepatitis C virus</i>
HIV	<i>Human acquired immunodeficiency virus</i>
HLD	<i>High level disinfection</i>
HPSA	<i>Helicobacter pylori stool antigen</i>
H. PYLORI	<i>Helicobacter pylori</i>
IAMM	<i>International Association of Healthcare Central Service Material Management.</i>

IG	<i>Immunoglobulin</i>
IL	<i>Interleukin</i>
INF	<i>Interferon</i>
ITP	<i>Idiopathic thrombocytopenic purpura</i>
LCGS	<i>Liquid chemical germicides</i>
LDL	<i>Low density lipoprotein</i>
MALT	<i>Mucosa associated lymphoid tissue</i>
MEC	<i>Minimal effective concentration</i>
MHC	<i>Major histocompatibility complex</i>
OEM	<i>Original equipment manufacturer</i>
OMPS	<i>Outer membrane proteins</i>
OPA	<i>Ortho-phthalaldehyde</i>
OSHA	<i>The Occupational Safety and Health Administration</i>
PAA	<i>Para acetic acid</i>
PAI	<i>Pathogenecity Island</i>
PCR	<i>Polymerase chain reaction</i>
PHPT	<i>Para hyperparathyroidism</i>
PPE	<i>Personnel protective equipment</i>
PPI	<i>Proton pump inhibitor</i>
RUT	<i>Rapid urease test</i>
SGNA	<i>Society of Gastroenterology Nurses and Associates</i>
SPSS	<i>Statistical program for social science version 12</i>
TMB	<i>Tetramethylbenzidine</i>
TNF	<i>Tumor necrotizing factor</i>
UBT	<i>Urea breath test</i>
USA	<i>United states of America</i>
VAC	<i>Vacuolating toxin A</i>

INTRODUCTION

H*elicobacter pylori*, a gram-negative bacterium found on the luminal surface of the gastric epithelium, was first isolated by Warren and Marshall in 1983. It induces chronic inflammation of the underlying mucosa. The infection is usually contracted in the first few years of life and tends to persist indefinitely unless treated. Its prevalence increases with older age and with lower socioeconomic status during childhood and thus varies markedly around the world. The higher prevalence in older age groups is thought to reflect a cohort effect related to poorer living conditions of children in previous decades (**McColl, 2010**).

It is estimated that 50% of the world's population is infected by *H. pylori*. Although most infections are not associated with clinical disease, a significant proportion will go on to develop some of the commonest problems in gastroenterology: gastritis, peptic ulcer disease, and gastric cancer. Although less than one percent of infected persons will develop gastric cancer, this is the fourth most common malignancy in the world. It is these strong disease associations which establish *H. pylori* infection as a leading gastroenterological public health problem (**Mandeville, 2009**).

Several modes of transmission of *H. pylori* have been described in the literature these include direct contact between subjects which is considered the most common mode,

contaminated water sources and food and less commonly iatrogenic transmission (during endoscopies and dental care) (*Salih, 2009*).

The potential for transmission of infection during a gastro intestinal endoscopy is a matter of concern to both physicians and patients. Fortunately, such transmission is very rare (*Banerjee, 2008*).

Some evidence exists that *H. pylori* infection may be more of a hazard for gastroenterologists and certain categories of nursing staff, but occupational risk factors for transmission remain incompletely elucidated (*Schryver, 2009*).

AIM OF THE WORK

To assess the prevalence of H. pylori infection among health care workers in endoscopy unit and evaluation of Infection control measures in endoscopy units.

Chapter (I)

HELICOBACTER PYLORI

Helicobacter pylori (*H. pylori*) is a curved or S-shaped gram-negative, non-capsulated, non-spore forming bacillus with a length of about 3 μm and a width of about 0.5 μm (figure 1). *H. pylori* is surrounded with cytoplasmic membrane which in turn is covered by an outer membrane. Both the outer and inner face of the membranes is covered with dot-like structures presumably corresponding to incorporated proteinaceous structures. *Helicobacter pylori* is predominantly an extracellular organism but intracellular penetration can rarely occur (*Navid et al., 2010*).



Fig. (1): *Helicobacter pylori* (*Navid et al., 2010*).

Helicobacter pylori is oxidase and catalase positive and hippurate negative. It is actively motile by hanging drop preparation with 4 to 6 lophotrichous sheathed flagella which are the most distinguishing structural characteristic of H. pylori. H. pylori is very similar to Campylobacter jejuni but is different in being urease positive while Campylobacter jejuni is urease negative. Campylobacter jejuni is motile with one polar flagellum while H. pylori has multiple polar flagella (*Fangrat et al., 2009*).

Helicobacter pylori: the bacterium and its virulence factors:

Helicobacter pylori is a Gram-negative spiral-shaped rod which has developed several mechanisms necessary for its survival and replication in the acidic environment of the stomach. H. pylori synthesizes urease, an enzyme catalyzing the hydrolysis of urea to ammonia, which alkalizes low stomach pH and produces a neutral environment around the bacteria (*Newell et al., 2007*).

It has been shown that urease activity depends on the PH around H. pylori, and it is increased in a lower pH which opens urea channels in the bacterial cell membrane. Urease has a toxic effect on gastric epithelial cells, and it is a potent immunogen which stimulates a strong immune response. Apart from urease and its product, ammonia, several other bacterial products are involved in the gastric tissue damage. Glycosulfatase, a proteolytic enzyme, degrades mucin and phospholipases A2
