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HELICOBACTER PYLORI INFECTION FREQUENCY AND OUTCOME OF UPPER GI ENDOSCOPY IN CHILDREN WITH ABDOMINAL COMPLAINTS

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ABSTRACT:

Purpose: The purpose of this study was to assess the frequency of H. pylori infections in children with upper gastrointestinal complaints. This study was also aimed to evaluate the usefulness of diagnostic methods and to assess the effectiveness of treatment.
Study design Cross sectional study:
Place & duration of study: Pediatrics unit, Civil Hospital, Karachi for 36 Months, (Aug. 2001 to Jul. 2004) .
Patients & methods: Upper gastrointestinal endoscopy and gastric mucosal biopsy were performed on 129 children who visited the OPD or were admitted to the Department of Pediatrics Dow University of health sciences & Civil Hospital Karachi or directly referred from other Pediatric facilities of the province from , Aug. 2001 to Jul. 2004 due to abdominal complains or upper gastrointestinal bleeding. All patients who under went upper GI endoscopy examination were analyzed retrospectively from record.
Results: Out of 129 biopsies, 70 were positive for H.Pylori culture and histopathological evidence.
Conclusions: The prevalence of H. pylori infection in children presenting with abdominal complaints was 54%. These children underwent for upper GI endoscopy who were referred due to abdominal complains. This is a very high rate of infectivity and physicians in general and pediatricians particularly need to keep a high index of suspicion for this organism, so that proper treatment for children with abdominal complaints might lower the incidence of peptic ulcer diseases or gastric cancer with advancing age.

INTRODUCTION:

In 1983, Warren (a biologist) and Marshall (a clinician) described Helicobacter pylori (HP). At first, they named the bacterium Campylobacter pyloridis. Later, it was named Campylobacter pylori. Since then, a large number of reports have been produced on HP and its pathogenetic potential. In fact, although peptic ulcer disease is the most studied disease related to HP infection, this bacterium is seemingly involved in the pathogenesis of several extra gastric diseases, such as mucosa-associated lymphoid tissue lymphomas (MALTomas), coronaritis, gastro esophageal reflux disease, iron deficiency anemia, skin disease, and rheumatologic conditions. However, at present, many of these associations remain largely uncertain, and the debate to confirm or refute causality related to these associations is still open.

The association of chronic HP infection with alterations in gastric mucosal cell proliferation is recognized worldwide. In addition, HP can produce and release several bioactive factors that may directly affect the stomach's parietal cells, which produce hydrochloric acid, and enterochromaffinlike (ECL) cells (ie, G cells and D cells), which produce gastrin and somatostatin, respectively. Evidence suggests that HP inhibits D cells and stimulates G cells. HP has some control mechanisms able to switch the transcription of different

genes on or off when needed.(1)

Estimates say >1 billion infected persons are living on this planet.(2) HP is a ubiquitous organism. HP may be detected in approximately 90% of individuals with peptic ulcer disease; however, less than 15% of infected persons may have this disease. The mortality rate related to HP infection is not precisely known, but it seems to be minimal (ie, approximately 2-4% of all infected people). Mortality is due to the complications of the infection, such as gastric ulcer perforation or MALTomas of the GI tract. Otherwise, the morbidity of HP infection can be very high. The pathogenetic role of HP may differ depending on geography and race. White persons are infected with HP less frequently than persons of other racial groups. The prevalence rate is approximately 20% in white persons, 54% in African American persons, and 60% in Hispanic persons. No sex predilection is known; however, females have a higher incidence of reinfection (5-8%) than males. HP infection may be acquired at any age. According to some epidemiologic studies, this infection is acquired most frequently during childhood. Similarly children also have similarly higher reinfection rate (5-8%). In Developing Countries adults are mostly infected acquisition occurs in about 10%.

Children better able to clear acute infection. Normal Gastric epithelial cells in stomach necessary for H.Pylori persistence

Genetic factors seem to play a role with more cases seen in first degree relatives

and in Monozygotic twins. Two basic phenotypes based on cytotoxin positivity, those who are positive have more pronounced inflammatory reaction.

Pakistani data is very limited. Studies suggest other modes of investigation besides the ones named) like HP stool antigen test (HpSA)(3). With the biopsy specimen acquired endoscopically we can perform rapid urease testing, culture, DNA PCR besides histology. Other Noninvasive tests are gaining rapid popularity like serum and whole blood antibody, saliva antibody, urine antibody and CLO urea breath test. (3)

This study was undertaken for the purpose of finding the disease burden in the community.

PATIENTS AND METHODS:

Data of the endoscopies done in pediatric unit II of Civil Hospital Karachi were retrieved. Record of 129 patients was scanned.

RESULTS:

129 cases underwent for tests for H. Pylori like urease, culture & histopathology. Out of these129, seventy came to be actually harboring the infection. That means almost 50% had the H. Pylori infection.

Total Patients	Upper GI endoscopy	H. Pylori Positive
129	70	54%

DISCUSSION:

This study reveals almost 50% cases had H. Pylori infection. Similar results were obtained by some other local studies. Histopathological Events after H pylori Infection include acute gastritis characterized by neutrophil infiltration into the foveolar and surface epithelium and epithelial degenerative changes. Acute phase lasts 1 to 4 weeks replaced gradually by a chronic, mononuclear infiltrate in the lamina propria. A Persistent infection occurs in the majority Cell-Mediated Immune Response and Cytokines Multiple H pylori antigens induce multiple cytokines à inflammatory reaction within the gastric mucosa. Interleukin (IL)-8, Leukotrienes, and complement activation products represent potent chemo-attractants for Neutrophils and Lymphocytes.

Well-known virulence factors of H.pylori are CagA, VacA, IceA, VacA is present in all H.pylori strains however, only 50% of strains are able to induce vacuolization in epithelial cells vitro

- ?agA gene: A marker for a large 40kb locus containing over 40 genes, 'pathogenicity island'. The cag A: locus exhibits inflammation- inducing activity.

The "pathogen city island" is also thought to encode a type IV secretary system that permits the surface expression of proteins interacting with epithelial cells. Target of H pylori-associated auto antibodies is the parietal cell proton pump, H+, K+-ATPase. [58] H. Pylori induced immune response includes humoral mechanisms involving robust mucosal antibody response, primarily of the IgA isotype and levels of IgG1, IgG2, and IgG4 subclasses typically are elevated

Histopathological Evaluation of H pylori Infection require visualization with special stains (eg, rapid Romanowsky, modified Giemsa, Genta, or silver stains) and Fluorescent DNA probes recognizing ribosomal RNA (rRNA) sequences= fluorescence in situ hybridization.[40].H.P survival depends on its shape and motility, Reduced oxygen requirement, adhesion molecules trophic to certain gastric cells, Potent producers of Urease . It is a fastidious organism that requires an enriched transport medium so that the biopsy specimen is plated for culture within 2 hours. There is increasing prevalence of drug-resistant H pylori infections eg metronidazole resistance approached 40%, and the prevalence of clarithromycin resistance exceeded 10%.[93], Resistance in vitro to clarithromycin by H pylori is clinically relevant, and a minimum inhibitory concentration breakpoint of 1 µg/mL is recommended by NCCLS.[97] Molecular diagnostics may enable the rapid detection of antibiotic resistance determinants Various studies supporting HP & RAP Association: ???

Treatment approaches are different for children.

According to the Canadian journal of gastroenterology population-based screening for H. pylori in asymptomatic children to prevent gastric cancer is not warranted; Testing for H. pylori in children should be considered if there is a family history of gastric cancer; The goal of diagnostic interventions should determine the cause of presenting gastrointestinal symptoms and not the presence of H. pylori infection; Recurrent abdominal pain of childhood is not an indication to test for H. pylori infection; upper abdominal pain of long duration require evaluation for h.pylori(13)

H. pylori testing are not required in patients with newly diagnosed gastro esophageal reflux disease;

Canadian Helicobacter Study Group Consensus Conference: Approach to Helicobacter pylori infection in children and adolescents—an evidence-based evaluation. pylori testing may be considered before the use of long-term proton pump inhibitor therapy; testing for H. pylori infection should be considered in children with refractory iron deficiency anemia when no other cause has been found; When investigation of pediatric patients with persistent or severe upper abdominal symptoms is indicated, upper endoscopy with biopsy is the investigation of choice; the 13C-urea breath test is currently the best noninvasive diagnostic test for H. pylori infection in children; There is currently insufficient evidence to recommend stool antigen tests as acceptable diagnostic

tools for H. pylori infection; Serological antibody tests are not recommended as diagnostic tools for H. pylori infection in children but could be initial screening test for suspected cases of H.pylori. First-line therapy for H. pylori infection in children is a twice-daily, triple-drug regimen The optimal treatment period for H. pylori infection in children is 14 days; and H. pylori culture and antibiotic sensitivity testing should be made available to monitor population antibiotic resistance and manage treatment failures.(4) One-week triple or dual therapy with two antibiotics achieved similar eradication rates. soon after treatment, symptoms disappeared or improved in most children irrespective of eradication. But epigastric pain recurred in the majority of the still-infected children within 2 years. [5]

Dual therapies in children using two antibiotics have a similar efficacy as triple therapies, with a proton pump inhibitor; they show a similar efficacy irrespective of duration. It does not seem necessary to administer them for more than one week [6].

CONCLUSION:

Almost 50% children undergoing upper GI endoscopy who were tested for H.Pylori had evidence of H. Pylori infection. This is a very high rate of infectivity and physicians in general and Pediatricians particularly pediatric gastroenterologists need to keep a high index of suspicion for this organism, so that timely diagnosis and treatment can be availed in order to keep the devil genie in the box.

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