

Screening of Helicobacter Pylori in Symptomatic Libyan Children

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ABSTRACT

Helicobacter (*H. pylori*) is among the most common bacterial infection in humans. The prevalence of *H. pylori* varies markedly between countries. In Libya we have not a good idea about the epidemiology in children. (*H. pylori*) is usually associated with peptic ulcer disease and gastric carcinoma. Typically, children get infected during the first decade of life, but diseases associated with *H. pylori* are seen mainly in adults. Since evidence from the literature postulates that *H. pylori* infection occurs mostly during childhood. Studying the epidemiology of this infection in pediatric patients can enable better understanding of the risk factors and consequences of infection. Multiple diagnostic methods are available for the detection of *H. pylori* infection. The aim of this study was to use non-invasive method (IgG serology) for diagnosis of *H. pylori* infection in a prospective observational study conducted among 130 children from May 2022 to May 2025 symptomatic children mainly complaining of recurrent abdominal pain, between two and eighteen years of age, attending outpatient clinic in Gharyan Teaching Hospital. IgG antibodies were measured in these patients' sera using a commercially available enzyme-linked immunosorbent assay (ELISA). *H. pylori* IgG antibodies were concordant in the general proportion of *H. pylori* infection for both male and female were 29%, 73% of infected children by *H. pylori* were males, 80% of *H. pylori* infected children were > 8 years old.

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Introduction

Helicobacter (*H. pylori*) is among the most common bacterial infection in humans. The prevalence of *H. pylori* varies markedly between countries, about 50% of children are infected by 10 years of age in developing countries [1-4].

H. pylori is a Gram-negative S shaped rod that produces urease, catalase, and oxidase, which might play a role in pathogenesis of peptic ulcer disease [5]. The method of transmission is unclear, but the most likely mode is fecal-oral or oral-oral. It can be cultured from the stool and vomitus of an infected child. The low socioeconomic status in children or a family affect the prevalence [6]. All children infected with *H. pylori* develop histologic chronic active gastritis but often asymptomatic. The main complaints of infected children are usually abdominal pain or vomiting, less often refractory iron deficiency anemia or growth retardation and rarely with chronic thrombocytopenia. Sudden infant death syndrome (SIDS), was reported also in *H. pylori* infection in children as an extra gastric manifestation [7,8]. Organic causes of RAP include *Helicobacter pylori* (*H. pylori*) infection, parasitic infestations, eosinophilic esophagitis, carbohydrate intolerance, irritable bowel syndrome, and urinary tract infections (UTIs) [9,10]. Among these, *H. pylori* infection has emerged as an increasingly recognized contributor, with prevalence rates varying by geography, age, and socioeconomic status. Chronic colonization with *H. pylori* can lead to an increased risk of developing duodenal ulcer and gastric cancer such as adenocarcinoma and mucosal lymphoma.

The risk of gastric carcinoma in adult is 2.3-8.7 times greater in infected persons compared to uninfected subjects. World Health Organization classifies *H. pylori* as a group I carcinogen [11]. *H. pylori* infection is diagnosed histologically by demonstrating the organism in the biopsy specimens as an invasive method [12]. C-UREA breath and stool antigen tests are noninvasive methods for detecting *H. pylori* infection. Serological assays using validated immunoglobulin *H. pylori* infection produce both cellular and humoral immune responses, resulting in an early increase in specific, and later and persistent increase in specific IgA and IgM level. IgM level IgA G antibodies, Specific anti *H. pylori* IgG antibodies in the serum offer a better sensitivity than IgA antibodies [13]. As in any other infection, *H. pylori* infection of the stomach exerts an immunological response in the body. The antibody response in children is too low-molecular weight antigens in the 15–30 kid range and take up to 60 days to develop [13]. Tests of serum immunoglobulin IgA or IgM antibodies are unreliable to detect gastric colonization and, therefore, only IgG antibodies are used in clinical laboratory practice, which is measured using an enzyme-linked immunosorbent assay (ELISA). The presence of IgG antibodies against *H. pylori* denotes active infection because once an individual is colonized, the infection continues throughout life unless a course of appropriate eradication therapy is instituted [14]. IgA and IgM, is tool for screening children for presence of *H. pylori* although it does not predict the acute infection but prove presence of *H. pylori*, but., Specific anti *H. pylori* IgG antibodies in the serum offer a better sensitivity than IgA antibodies [15]. Stool testing for *H. pylori* is an inexpensive, noninvasive method for determining *H. pylori* infection [15,16]. If infection with *H. Pylori*

is proved after endoscopic examination and biopsy, eradication therapy should be offered even if the child is without symptoms. Also, it was mention that treatment is indicated in documented gastric or duodenal ulcer, histologically proven gastric metaplasia, Gastric MALToma, Prior documented gastric or duodenal ulcer with current active infection [17]. A better understanding of the H. pylori disease spectrum childhood should lead to clearer recommendations about testing for and treating H. pylori infection in children who are more likely to develop clinical sequelae [17,18]. Therefore, this study was conducted in the pediatric out patients in Gharyan Hospital to determine the prevalence of H. pylori infection among children, and to plan for further management.

Methods

An observational prospective study was conducted in the Outpatient Clinics of the Gastroenterology outpatient clinic of the Gharyan Teaching Hospital, A total of 130 children Aged 2 TO 18years, complaining mainly of chronic abdominal pain were enrolled and H. pylori was diagnosed using serum IgG.

Results

Based on statistical analysis of random sample of 130 child in Gharyan city. The inferential results have been subjected to Z statistical tests with 0.05 significant level, which were as following: The general proportion of H. pylori infected for both male and female were 29%. 73% of infected children by H. pylori were male Figure (1), 80% of H. pylori infected children were over 8 years of age. Figure (2)

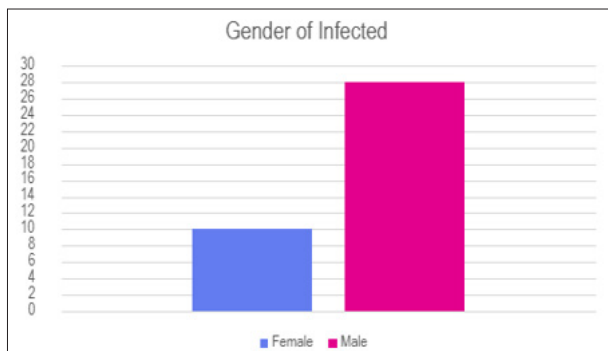


Figure 1: Distribution of Infected Children with Gender

*This Bar Chart is Clarifying the Infected Children by Gender



*This Boxplot Shows that the Age Distribution of Infected Children is Normal Distribution and Did Not Including Any Extreme or Outlier Values

Discussion

According to my knowledge there is no wide ideas about the H. pylori infection among children in our society, and its effect on children health.

The current study showed a prevalence of (29%) of H. pylori infection among symptomatic children attending the Outpatient Clinics of Gharyan teaching hospital complaining of chronic abdominal pain. This result is lower than that observed in previous studies among children in other countries around us as in Egypt, which reported H. pylori infection in 72.4% and 68% of children [19]. it is also lower than that detected in other countries of the Eastern Mediterranean region like Saudi Arabia, where a 49.8% [20]. Prevalence of H. pylori infection was detected among symptomatic children (Most of the studies performed in America found an overall H. pylori infection prevalence of approximately 50% [21]. The most important risk factors in America include being male. prevalence of h. pylori infection in European children was almost 25% [22]. This variation of infection rates between studies may be due to different factors such as study design, sample size, patient inclusion criteria, type of the investigation methods, techniques used for h. pylori detection and different social media.

In this study, the prevalence of H. pylori was found to increase with age; more infected children are >8years old 80%, figure (2) The boxplot shows that the age distribution of infected children is normal distribution and did not including any extreme or outlier values, this could be explained by increased children's contact with the community and outdoor exposure with practicing new dietary practices like eating from coffees and restaurants. Also, more males 73% than females only 27% are positive for H. pylori infection., in our study figure (2). This bar chart is clarifying the infected children by gender, it could be due to different attitude in our society where males contact with the community more freely than females and share outside meals together with their friends while, using public toilets and commercial foods and share places for camping with overcrowding, which are proved to be risk factors for acquisition H. pylori infection [23]. These behaviors are restricted for females in our place. In accordance with other studies [24]. gender was not found to be a risk factor for childhood infection with H. pylori as in the present study. While in a study done by Sayed et al. gender was a risk factor. Children from rural areas had a significantly higher infection rates than those from urban areas [25]. This could be attributed to the poor socio-economic status, poor sanitation, bad hygienic behaviors, and absence of sources of pure water supply among people living in rural areas. Which usually happen during outside door activity.

Other studies found that infection increases in early childhood due to bed or bedroom sharing with an infected sibling [26]. In In our study we collect the samples of the patient during a long periods we include children who have a chronic abdominal pain so nearly one third have positive H. pylori infection as compared to other studies as that study conducted in Saudi Arabia, children with abdominal pain were 2.39 times more likely to have H. pylori infection [27].

Conclusion and Recommendation

- H. pylori is positive in around the third of the total subjected children complaining of chronic abdominal pain.
- We need further evaluation for these children and management to plane who should be treated for H. pylori
- Recurrent abdominal pain in children is a common complaint so we should include H. pylori as cause in our differential diagnosis.

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