ENDOSCOPIC DIAGNOSIS OF SUSPECTED H. PYLORI INFECTION IN SULAIMANI PEDIATRIC TEACHING HOSPITAL

Heersh HMH Raof Saeed [a]

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ABSTRACT

Background

Helicobacter pylori is a common cause for chronic gastritis, gastric atrophy, peptic ulcer disease in pediatric age group. Infection is more common in developing countries; Transmission is fecal-oral, or oral-oral from human-to-human contact. Serology, stool antigen, urea breath test and endoscopy are used for diagnosis.

Objectives

To evaluate endoscopic finding and biopsy results of those children underwent upper gastrointestinal endoscopy

Patients and Methods

We conducted this study on 49 children, all suspected of *H. pylori* infection, different methods were used for diagnosis serology, stool antigen and urea breath test. Every child checked by anesthesiologist before endoscopy, in all children endoscopy done after giving anesthesia, biopsy taken from every child and sent to histopathology.

Results

In our study, sensitivity of serology was 60%, while sensitivity of stool antigen test for *H. pylori* was 80% and sensitivity of Urea breath test was 92%. Ninety percent of children with endoscopic finding of nodular gastritis were *H. pylori* positive on biopsy result while 62% of children with gastritis were positive for *H. pylori* on biopsy result.

Conclusions

Urea breath test is most accurate test for diagnosis of *H. pylori* infection, next test is stool for *H. pylori* antigen while serology is not accurate for diagnosis.

Keywords: *H. pylori, Urea breath test, Stool antigen, Gastritis.*

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[a] Department of Pediatrics, College of Medicine, University of Sulaimani, Kurdistan Region, Iraq.
Correspondence: heersh.raof@univsul.edu.iq

INTRODUCTION

In 1983, Robin Warren, a pathologist in Perth, reported the presence of "curved bacterium" in the mucosal layer of the gastric biopsy specimen. Together with Barry Marshall, they subsequently isolated the organism from the gastric biopsy specimens and named it *Campylobacter pyloridis* (*C. pylori*) [1]. Later reclassified as *Helicobacter pylori* (*H. pylori*) [2].

Prevalence of *H. pylori*, a worldwide infection, varies greatly among countries and among population groups within the same country [3]. The pattern of infection is an early childhood acquisition of *H. pylori* (30%-50%) that reaches over 90% during adulthood in developing countries. This has been attributed to the poor socioeconomic status and overcrowded conditions [4].

Helicobacter pylori infection of stomach induces chronic inflammation. Production of ammonia by this urease-producing bacteria and release of biochemicals such as proteases, vacuolating cytotoxin A and phospholipases contribute significantly to its inflammatory (gastritis) and carcinogenic potential [5]. Furthermore, *H. pylori has* been linked to a variety of extra-gastric disorders [6].

Acute phase of colonization with *H. pylori* may be associated with transient nonspecific dyspeptic symptoms, such as fullness, nausea, and vomiting, and with considerable inflammation of either the proximal and distal stomach mucosa, or pangastritis. This phase is often associated with hypochlorhydria, which can last for months. It is unclear whether this initial colonization can be followed by spontaneous clearance and resolution of gastritis and, if so, how often this occurs [7].

Chronic gastritis the other stomach disorder is characterized by multistep, progressive, and life-long inflammation disease. One may estimate that more than half of the world population have this disease in some degree and extent, indicating that even many hundreds of millions of people worldwide may have chronic gastritis in a form or other [8].

Historically, serology approach was the first suggestion in order to diagnose *H. pylori* infection. Although the Stool Antigen test is an accurate and precise method this accuracy is influenced by several limiting factors: upper gastrointestinal bleeding, antibiotic consumption, bowel movement, and also proton pump inhibitors (PPIs) uptake [9].

Urea breath test (UBT) is a very attractive method to measure the *H. pylori* active infection by microbiologists and clinicians, the UBT is a gold standard method [10].

Serological diagnosis another way of diagnosis. Due to the different backgrounds in host genetics, it can be expected that various *H. pylori* strains induce different levels of antibodies and it may be a considerable item in explaining the reported findings [11].

Gastritis updated Sydney grading is used to categorized gastritis according to histopathological change in biopsy sample [12].

PATIENTS AND METHODS

This is a retrospective study conducted in gastro-enterology unit in Pediatric Teaching Hospital in Sulaimani. We collected 49 children suspected of *H. pylori* infection who underwent upper gastrointestinal endoscopy from April 2017 to August 2018 .

Serology, stool test for *H. pylori* antigen and urea breath test were the methods of investigation used for diagnosis of *H. pylori* infection in our city. Serology test done by using immunochromatographic strip test for H. pylori IgG, IgM, IgA, all labs uses immunochromatographic monoclonal test for detection of *H. pylori* antigen in stool.

Selected children with positive test for *H. pylori* were admitted to hospital on day prior to endoscopy. Patient information were registered on database and information about name, age, sex, date, referred physician and clinical data. Investigation done before admission and procedure were recorded. File maker pro software used for data entry and SPSS 17 used for data analysis and finding correlation. In our study we used sensitivity (Sensitivity=true positive / true positive + false negative) and specificity (true negative / true negative + false positive) for comparison.

Endoscopy was done under general anesthesia and biopsy was taken from pyloric region, incisura and body. Biopsy samples were stained by hematoxylin and eosin stain and examined under electron microscopy for *H. pylori* infection and updated Sydney system grading used for detection of gastritis [13].

Children underwent upper endoscopy without documented investigation for diagnosis was excluded from this study.

RESULTS

Forty nine children were enrolled in our study, 23 (46.9%) were male and 26 (53.1%) were female, Table 1.

Twenty two children had positive serology for H. pylori: 9 of them proved *H. pylori* infection by biopsy result, sensitivity of serology test for *H. pylori* was 60%, and specificity was 7% as shown in Table 2.

Nineteen of children had positive stool antigen test: 16(84%) of them proved to have *H. pylori* infection by biopsy result. Sensitivity of stool test for *H. pylori* infection was 80%, while specificity was 75%, Table 3.

Twenty eight of children have positive urea breath test: 26 (93%) of them proved *H. pylori* infection by biopsy result, sensitivity of urea breath test was 92% and specificity was 50%, Table 4.

Thirteen children had normal endoscopic finding, four of them were positive for H. pylori infection on biopsy, another thirteen children had gastritis on endoscopy, eight of them were positive for H. pylori infection on biopsy. Twenty one children had nodular gastritis on endoscopy, nineteen of them were positive for H. pylori infection on biopsy, Table 5.

Table 1. Sex distribution.

Gender	Frequency	Percent
Male	23	46.9
Female	26	53.1
Total	49	100

Table 2. *H. pylori* results according to serological tests.

Serology for *H. pylori*	*H. pylori* biopsy result		total
	Positive	Negative	
Positive serology	9	13	22
Negative serology	6	1	7
total	15	14	29
Sensitivity	60%		
Specificity	7%		
Predictive value of positive test	40%		
Predictive value of negative test	14%		

Table 3. *H. pylori* results according to Stool test for *H. pylori* Ag.

Stool test for *H. pylori* Ag	*H. pylori* biopsy result		Total
	Positive	Negative	
Positive Stool test	16	3	19
Negative Stool test	4	9	13
total	20	12	32
Sensitivity	80%		
Specificity	75%		
Predictive value of positive test	84%		
Predictive value of negative test	69%		

Table 4. *H. pylori* results according to Urea Breath Test (UBT).

Urea Breath Test	*H. pylori* biopsy result		Total
	Positive	Negative	
Positive UBT	26	2	28
Negative UBT	2	2	4
Total	28	4	32
Sensitivity	92%		
Specificity	50%		
Predictive value of positive test	92%		
Predictive value of negative test	50%		

Table 5. *H .pylori* infection according to endoscopic finding.

Endoscopic finding	*H.pylori* biopsy result		Total
	Positive	Negative	
Normal	4(31%)	9(69%)	13
Gastritis	8(62%)	5(38%)	13
Nodular gastritis	19(90%)	2(10%)	21
Ulceration	2(100%)	0	2
Total	33	16	49

DISCUSSION

Helicobacter pylori infection is very common infection in community reaching 50% of population according to many recent epidemiological studies, different type of investigation including invasive and non-invasive methods are present for detection of *H. pylori* infection. Except serology test, other tests revealed good correlation with biopsy results.

In our study, from 49 cases: 23 (46.9%) were male and 26 (53.1) were female. This result is similar to another study done in Saudi Arabia were children under 13 years: 48% were male and 52 % were female [(14)].

In our study sensitivity of *H. pylori* serology test was 60% and specificity was 7%. According to this finding, this test cannot be used on its own for diagnosis of *H. pylori* infection because of low sensitivity and very low specificity. Similar results also reported elsewhere, Akbar and Eltahawy who found sensitivity of 90% and specificity of 47% in Saudian population [(15)], another study done in Iran by Pourakbari et al showed very low sensitivity 29% and high specificity 91% in Iranian children [(16)], this difference comes from the method used for serology, in our test direct strip test for *H. pylori* antibody used while in Iran and Saudi Arabia ELISA based technique used.

Regarding stool antigen test: in our study this test showed sensitivity of 80% and specificity of 75% , this result is similar to another study done in Iran by Iranikhah et al who found sensitivity of 85% and specificity of 93% in Iranian children[(17)] . Our study showed less sensitivity probably because of better exclusion criteria in Iranian study where any child receiving management within one month excluded.

Urea breath test is another modality for *H. pylori* diagnosis. Our study showed sensitivity 92% and specificity 50% , another study done in Iran by Shadi Kazemi showed sensitivity of 89% and specificity of 73% for urea breath test [(18)]. Another study done in Saudi by Al-fadda showed high sensitivity 85% and specificity 70% [(19)]. We can explain low specificity in our test by excessive use of antibiotic specially macrolide in our region and using of Proton Pump Inhibitors within one month prior to the endoscopy which affect bacterial load and cause high false negative results.

In our study 31% of the children with normal endoscopic confirmed *H. pylori* infection while 90% of children with nodular gastritis confirmed *H. pylori* infection. Another study done in Saudi Arabia showed that nodular gastritis was most common (40%) endoscopic finding in children with *H. pylori* [(20)]. M. Najafi Sani,et al. observed that nodular gastritis is commonest finding and 80% will have *H. pylori* infection on biopsy result [(21)].

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