

PREVALENCE of H.PYLORI in CHILDREN with DIARRHEA

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Abstract:

Background: *Helicobacter pylori* (*H. pylori*) infection is common in developing countries. *H. pylori* infection epidemiology is variable, because the prevalence is high and occurrence of infection in happen in young ages in developing or poor countries compared to that which consider as developed countries.

Study aim: was to determine the prevalence of *Helicobacter pylori* among children and to evaluate some epidemiologic characteristics.

Methods: prospective cross sectional study was conducted at AL Hijjaj Primary Health Care Center during seven months period from 1st of April to 31 of October 2018. Tottle cases 120 (68 male, 52 female) presented with diarrhoea, their age range from birth to 6 years old. Stool samples were collected from each patient and send for *Helicobacter pylori* stool Antigen (HpSAg).some relevant factors like sex, source of water, type of feeding, educational level of the mothers and fathers are studied.

Results: among 120 total cases,40.8% are positive for *H.pylori* stool Ag(HpSA), there is weak association between gender and HpSA presence, Very strong association between source of water and HpSA presence, Moderate significant association between type of food and HpSA presence, no significant association between fathers and mothers education and HpSA presence.

Conclusion: *H.pylori* infection present in about 40.8 % of patients presented with diarrhea. Source of water is significantly related to the presence *H.pylori* infection.

Key words: *Helicobacter pylori*, *H.pylori* stool Ag(HpSA), relevant factors, diarrhea.

INTRODUCTION

Helicobacter pylori (HP) is a gram-negative bacillus and one of the most common infections found in humans all over the world. In early eighties it isolated and cultured by Warren and Marshall, and after that they recognized its relationship to gastric and duodenal ulcers at all ages[1]. The prevalence of *H.pylori* is more in developing countries which reach about 10% of the population and more among younger ages,while reaching up to 0.5% in more developed countries. HP is mostly asymptomatic in children [2].

In countries where prevalence is high, transient infections is common in infants and toddlers, and the result of this infection on the short- and long-term immune response are still unclear. The question is which of *H. pylori*-infected children get benefit from treatment and what are the best regimen to treat the infection in the presence of antibiotic resistance [4].

H. pylori infects about a half of the population and represents and is inversely related to socioeconomic status or household sanitation and hygiene. More than 80% of the population is *H. pylori* positive, even at young ages in developing countries, while in developed countries the prevalence remains under 40% and is consider lower in children than in adults and elderly people .[5]

H. pylori infection is commonly acquired in childhood. In developed countries ,the prevalence of infection in children about 2.4 to 13.6% while from 22.6 to 80% in developing countries. This difference could be due to overcrowded conditions and poor socioeconomic status during childhood[5]

In pediatrics, infection with *H. pylori* can present as pain in abdomen , vomiting and, and may present as iron deficiency anemia not respond to treatment or failure to thrive. Chronic infection with *H. pylori* can put the patient in a high risk of having peptic ulcer and gastric malignancies. The relative risk of gastric carcinoma increases about 2.3-8.7 times more in *H. pylori* infected person than uninfected person . [9]

In countries that consider developing, there is evidence that *H. pylori* release potent urase that cause suppression of the gastric acid barrier and allowing entero-pathogens ingested from contaminated foods to gain access to the small intestine. This will lead to childhood diarrhea, malabsorption of essential elements such as vitamins B12 and C , and this will lead to growth failure.[6]

The diagnostic tests are divided into invasive and noninvasive methods. Invasive tests(biopsy depend) include endoscopy, culture, histology, polymerase chain reaction (PCR) and rapid urease test (RUT). Noninvasive diagnostic tests include 13C-urea breath test (UBT), serology and stool antigen test (SAT).[7]

Helicobacter pylori stool antigen (HpSA) test is a reliable noninvasive test for diagnosis of *H. pylori* infection in both children and adults . The HpSA test using an enzyme immunoassay is used to determine the status of *H. pylori* infection with good diagnostic accuracy before eradication therapy and also after therapy. The rapid HpSA test is consider as a reliable test and easy to used in clinical practice. When the HpSA test is used, some factors can be affect the diagnostic accuracy such as temperature, drug , gastrointestinal bleeding and diarrhea as accompanying symptoms should be considered to interpret the results of the HpSA test.[8]

METHODS AND MATERIALS

This prospective cross sectional study was conducted at AL Hijjaj Primary Health Care Center during seven months period from 1st of April to 31 of October 2018.

Sample collection : totle cases 120 (68 male, 52 female) presented with diarrhea ,their age range from birh to 6 years old.

Constructed and informative questionnaire were given to the parents include some relevant factors like age, gender, water resource, feeding type and educational level of father and mother.

Stool samples were collected from each patient and send for Helicobacter pylori stool Antigen (HpSAg). Their fecal samples were analysed for HpSAg using *Helicobacter pylori*

Stool Antigen (HpSAg) Rapid Test Kit Card Format .This is an immunoassay kit coated with *H. pylori* polyclonal antibodies capable of detecting HPSA in fecal samples which is based on double antibodies chromographic lateral flow assay.

Data Analysis

statistical data were expressed and comparisons of proportions was performed. variables were compared using Chi square test. $P < 0.05$ was considered as statistically significant.

Exclusion criteria

Any child who had taken antimicrobial therapy (e.g metronidazole) and or proton pump inhibitors within 2 weeks before samples collection was excluded.

RESULTS

- Total number of cases 120 ,68 male(57%) and 52 female (43%)
- The cases that have positive H.pylori Ag fecal test are 49 (29 male and 20 female).
- The cases that have negative H.pylori Ag fecal test are 71 (39 male and 32 female).

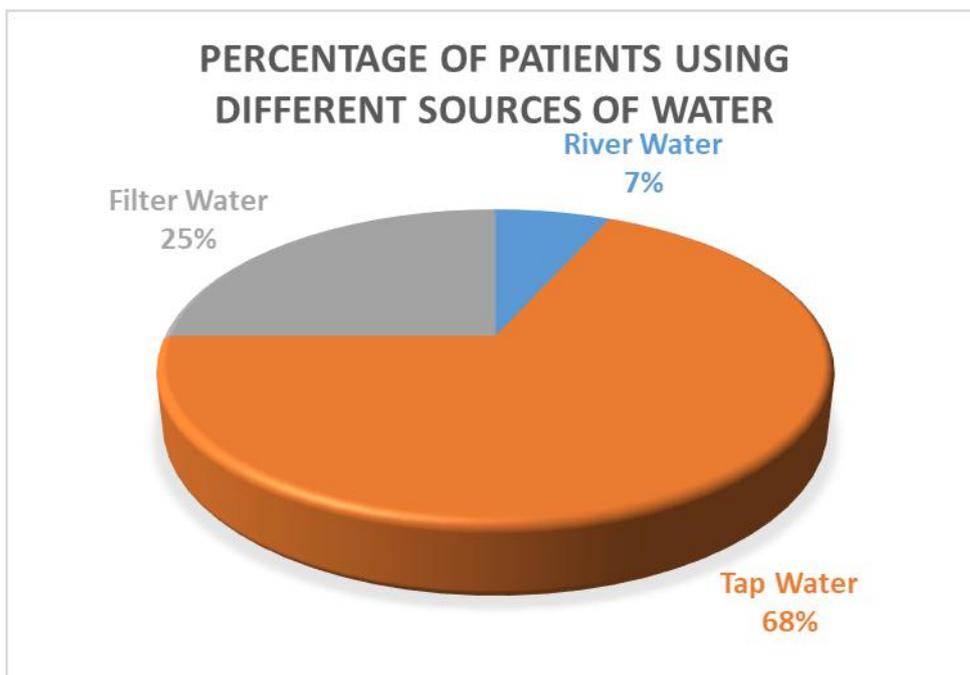
Result of fecal test	male	female	total
Positive HpAg	29(59.1%)	20(40.8%)	49(40.8%)
Negative HpAg	39(54.9%)	32(45.1%)	71(59.2%)
Total	68(57%)	52(43%)	120(100%)

- Chi=0.21
- P-value= 0.01

Weak association between gender and h.pylori presence

❖ The patients use different sources of water ,these include:

(1) river. (2) tap water. (3) filter ,as the following graph:



- Stool antigen results Vs. water resource:

Water resource	Number of +ve stool antigen	Number of -ve stool antigen
(1) River	6	2
(2) Tap	40	42
(3) Filter	3	27

Statistics

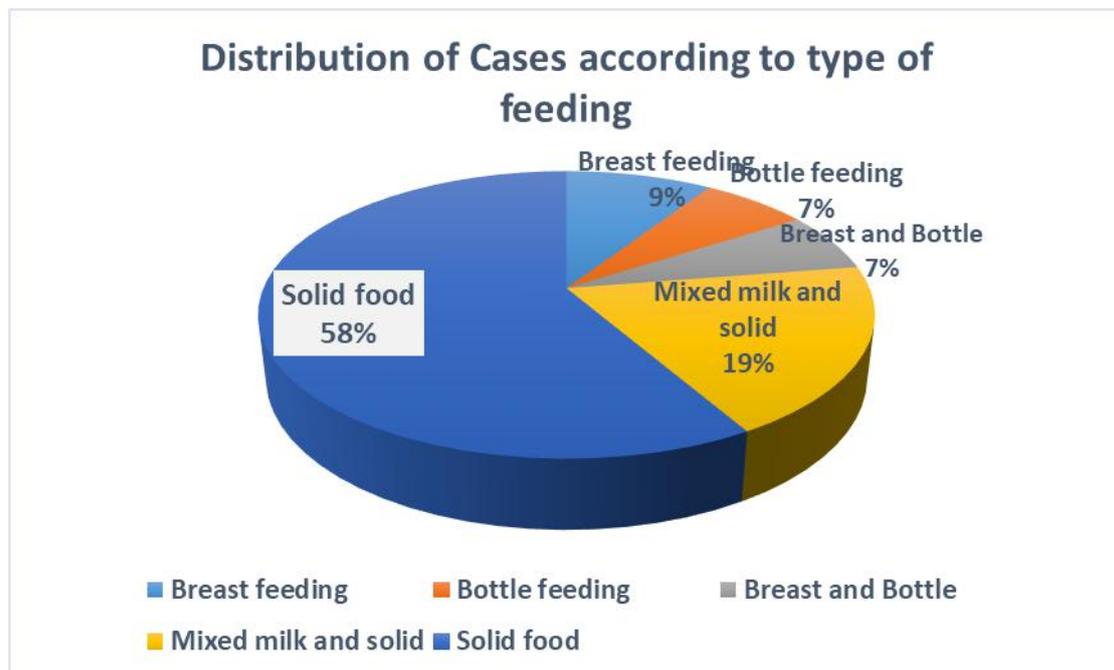
- Chi=17.8
- P-value= 0.001

Very strong association between source of water and antigen presence.

- ❖ The patients also divided according to the type of feeding as the following

- (1) Breast feeding.
- (2) Bottle feeding.
- (3) Both (breast and bottle milk).
- (4) Mixed milk and solid food.
- (5) Solid food.

The distribution of patients according to the type of feeding as following graph:



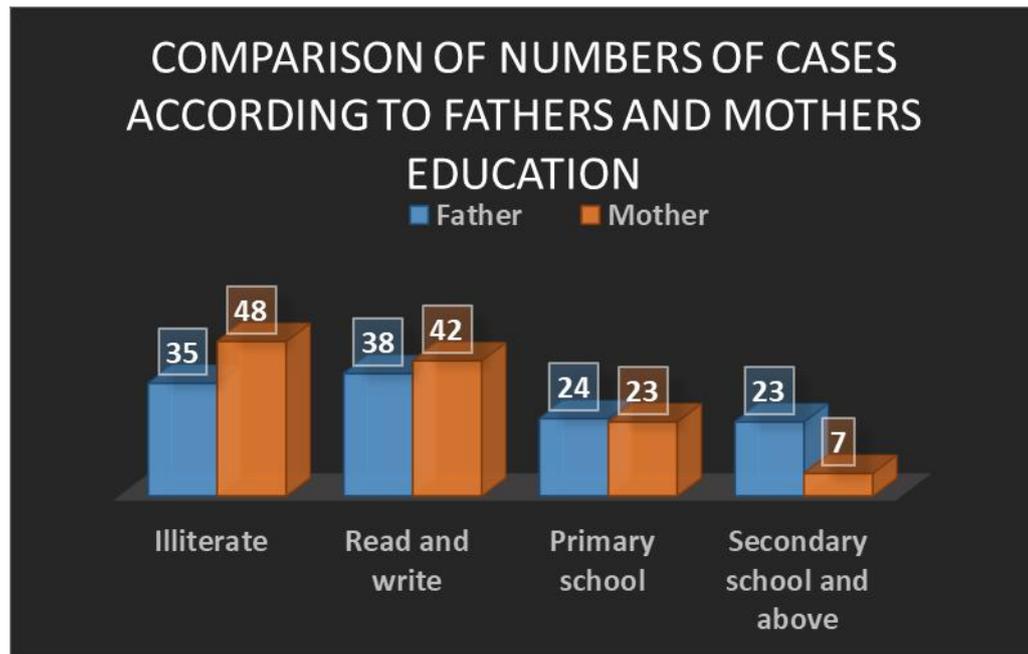
- Stool antigen results Vs. type of food:

Type of food	Number of +ve stool antigen	Number of -ve stool antigen
(1) Breast feeding	2	9
(2) Bottle feeding	6	2
(3) Both (breast and bottle milk)	Zero	8
(4) Mixed (milk and solid food)	9	14
(5) Solid food	32	38

Statistics

- Chi=12.4
- P-value= 0.01
 - Moderate significant association between type of food and antigen presence.
 - ❖ The patients also divided according to the Level of education of the mother and father
- (1) Illiterate.
- (2) Read and write.
- (3) Primary School.
- (4) Secondary school and above.

The distribution of patients according to level of education as following graph:



- Stool antigen results Vs. fathers education:

Fathers education	Number of +ve stool antigen	Number of -ve stool antigen
(1) Illiterate	19	16
(2) Read and write	16	22
(3) Primary School	7	17
(4) Secondary school and above	7	16

- Chi=5.
- P-value= 0.01
 - No significant association between fathers education and stool antigen presence.

- Stool antigen results Vs. mothers education:

Mothers education	Number of +ve stool antigen	Number of -ve stool antigen
(1) Illiterate	23	25
(2) Read and write	18	24
(3) Primary School	8	15
(4) Secondary school and above	zero	7

Statistics

- Chi=6.24
- P-value= 0.01

Not significant association between mothers education and stool antigens presence.

DISCUSSION

H. pylori, one of the most common organisms causing infection in human, it is the most common cause of chronic gastritis. It can colonize the gastric mucosa and may persist throughout the patient's life until the patient is treated. It is the only bacterium regarded as a carcinogen by the World Health Organization (WHO) because it plays a role in the development of gastric cancer.

Stool Ag test is one of the most important non-invasive tests that is commonly used in the diagnosis of *H. pylori* infection, because it is accurate and comparable to invasive tests (5). In this study *H. pylori* stool Ag test was considered as a method for diagnosis of *H. pylori* infection.

The prevalence of *H. pylori* infection varies from one place to another. For example, in the United States, *H. pylori* in children is lower than 5% (16). In Japan, the prevalence of *H. pylori*-associated infection was 29% (17). The prevalence of *H. pylori* was 34% among children, in Italy (18). While in Bangladesh, Mahalanabis *et al.* found the prevalence of *H. pylori*-infection is 84% of 469 children studied (19). In Australia, among 227 children, Mitchell *et al.* found the prevalence of *H. pylori*-infection is 14.1% (20). In our study, we found a prevalence of (40.8%) for *H. pylori*-positive infection among children aged 1-5 years. Studies from Turkey show that the seropositivity of *H. pylori* is 43.9% (21).

There is a weak association between gender and *H. pylori* presence, this agrees with the finding of Ahmed Abdul Hadi *et al.* (2018) while Olufemi *et al.* (2015) confirms a significant relationship with more males being infected than females, while Yaw Asante *et al.* show female predominance. (9,6,13,24)

Our study shows a very strong association between source of water and antigen presence because source of drinking water increased the rate of infection (river and tap water more than filtered water). Water is an important source of *H. pylori* infection and this is approved by many studies, so that handling of water and poor sanitation will be a good media for the spread of infection, and our study supports this fact. This finding goes with Yaw Asante *et al.* (2017) while Olufemi *et al.* and Ahmad *et al.* (2018) find no significant relation between source of water and presence of stool Ag. (13,6,9, 23)

Our study also shows a moderate significant association between type of food (breast feeding, bottle feeding, both (breast and bottle milk), mixed milk and solid food, solid food) and antigen presence, in comparison with other studies. In Shiraz, Iran, studies find that the incidence of *H. pylori* infection in exclusively breastfed infants was highly lower than that of infants with bottle feeding (14). While Masoumeh *et al.* said no role of breast feeding in protection from *H. pylori* infection. (15)

The patients in our study also divided according to the level of education of the mother and father (illiterate, read and write, primary school, secondary school and above). There is no significant association between mothers' and fathers' education and stool antigen presence. This goes with the finding of Olufemi *et al.* while Karimeldin *et al.* show low educational level increases risk of infection. (6,1)

CONCLUSIONS

- 1) *H. pylori* infection present in about 40.8% of patients presented with diarrhea
- 2) Source of water is significantly related to the presence of stool Ag.

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