

Research Article

The Prevalence of Helicobacter Pylori Infection among Medical Science Students of Hodeidah University- Republic of Yemen

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ABSTRACT

Background: The prevalence of Helicobacter pylori (H. pylori) infection worldwide varies greatly among countries and among population groups within the same country.

Objective: The aim of this study was to evaluate the prevalence of H. pylori infection among Medical Sciences' students of Hodeidah University, Yemen.

Methods: A total of 150 students were recruited (50 males [33.3%] and 100 females [66.7%]) with a mean age of 21.6±1.6 years (age varied from 19 to 27 years).

General characteristics and other relevant information of the students in this study were collected using pre-designed questionnaire, which included information such as demographic data, clinical symptoms and socioeconomic status.

Serum samples were collected from all volunteers and then blood rapid qualitative serologic test was used for the diagnosis of H. pylori by detecting H. pylori antibodies.

Results: The prevalence of H. pylori was 68% (102 of the volunteers showed positive results). The higher infection rate was reported in females (69.6% of positive results= 71 female volunteers) with no significant difference between the positive and negative results.

Conclusion: There was a high prevalence of H. pylori infection in our young university Medical Sciences' students' population This high prevalence in this young population may have both important clinical and economic implications.

Key words: H. pylori, Medical sciences' students, Yemen

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INTRODUCTION

Helicobacter pylori (formerly called Campylobacter pylori) are a spiral Gram-negative microorganism that is distributed worldwide. It is estimated that over 50% of the world's population are infected with H. pylori.⁽¹⁾ H. pylori associated infection is either usually clinically silent or its signs and symptoms are non-specific. Gastroesophageal reflux, esophagitis, delayed gastric emptying, and various motility disorders can be a sign or symptom of it.⁽²⁻⁴⁾ However, these symptoms are seen in many childhood illnesses. Younger children with peptic

complaints may not have symptoms as clear as those of older children, and diagnosis of infection due to H. pylori is more difficult.^(2, 5, 6) H. pylori is recognized as the most important causative agent for chronic gastritis and is present in 90% of duodenal ulcers and 70% of gastric ulcers. It is also a cofactor for gastric cancer and mucosa-associated lymphoid tissue (MALT) lymphoma.^(5, 7)

Definitive routes of transmission of H. pylori infection have not yet been characterized, and the principal reservoir appears to be family members. Person-to-person transmission via the faecal-oral and oral-oral routes have been proposed.^(8, 9) The epidemiology of H. pylori-associated infection

is variable, since the prevalence is significantly higher and infection occurs in earlier ages in developing or poor countries compared to developed countries. The prevalence of infection seems to mostly depend on the rate of acquisition, in addition to the rate of loss of infection and the length of the persistence period between acquisition and loss.^(10, 11) Based on these factors, *H. pylori* prevalence differs from one country to another and may differ between different ethnic, social, or age groups within the same country.^(10, 12, 13)

Epidemiological studies have demonstrated that the prevalence of infection is estimated to be about 50% of the adults in the developed countries, which increases with advancing age.⁽¹⁴⁾ It reaches up to 90% of adults in developing countries and this high prevalence was found among low socioeconomic level populations, probably due to conditions that favor the acquisition of infection such as precarious hygiene, crowded living conditions, and absence or deficiency of sanitation.^(2-5, 13)

The aim of this study was to evaluate the prevalence of *H. pylori* infection and its relationship with the affecting factors (demographic and socioeconomic data) among Medical Sciences' students of Hodeidah University.

METHODS

Study setting and design

This cross section study was carried out during the period from March 2011 to August 2013, in Faculty of Medical Sciences; Hodeidah University, Yemen.

Study population

A total of 150 Medical Sciences' students of Hodeidah University (50 males, and 100 females) who agreed to participate were included in the study.

Data collection

The data were collected by face-to-face interview using a pre-designed questionnaire which was filled out for every student under the study. The questionnaires included questions on age, sex, blood group, parents' education, socioeconomic status,⁽¹⁵⁾ parents' occupation, Khat chewing (Khat is a chemical extract from a plant *Catha Edulis*, used as a natural stimulant in

East Africa and bordering Arabic states mainly Yemen), smoking, alcohol and caffeine consumption, the presence of gastric symptoms, and hygienic behaviors.

- Each student consented to have a blood sample to perform the *H. pylori* serological test.

Diagnosis of *H. pylori* infection

Two ml of blood sample was collected from each student. Serum was separated and used for detection of *H. pylori* IgG antibodies by the Rapid Hp StAR (Dako Cytomation Ltd., United Kingdom) according to manufacturer's instructions.

Statistical analysis

Chi-square (χ^2) test was used to compare the prevalence of *H. pylori* infection in the different categories of the explanatory variables. The significance level was set at 0.05.

RESULTS

In the present study, a total of 150 students were recruited [50 males (33.3%) and 100 females (66.7%)] with a mean \pm SD age of 21.6 \pm years (age varied from 19 to 27 years). All volunteers were Yemeni living in Hodeidah governorate.

The prevalence rate of *H. pylori* infection was 68% (102 out of 150). Among *H. pylori* positive results, 31(30.4%) were males and 71(69.6 %) were females. The fathers were without stable or governmental work in 86.3% of those showing positive infection, while the fathers were working in 87.5% of those showing negative infection. Socioeconomic status was found to be one of the most important factors affecting the spread of *H. pylori* infection, where 80.39% of the positive samples were associated with low socioeconomic status.

About one third of the fathers of the students with positive infection were either illiterate (39.2%) or had primary level of education (33.3%). About two thirds (76.5%) of the mothers of the students with positive infection were illiterate. Most (67.6%) of the students who showed positive infection had blood group (O). There was no statistical significant difference between *H. pylori* infection and different characteristics of the studied students (Table 1). Table (2) illustrates the relationship between *H. pylori* with the drinking water source and some hygienic behaviors. It was found that about 60% of

positive samples were taking their drinking water

from tap. Approximately all studied subjects whether

Table 1: Relation between *H. pylori* infection and the general characteristics of students

General characteristics		(+ve) <i>H. pylori</i> n=102(68%)	(-ve) <i>H. pylori</i> n=48(32%)	Total (%) n=150(100%)	X ²	p-value
Age	< 20	33(32.4)	13(27.1)	46(30.7)	0.476	0.788
	21-23	58(56.9)	30(62.5)	88(58.7)		
	≥24	11(10.8)	5(10.4)	16(10.7)		
Gender	Male	31(30.4)	19(39.6)	50 (33.3)	1.241	0.265
	Female	71(69.6)	29(60.4)	100 (66.7)		
Blood Group	A	26(25.5)	12(25.3)	38(25.3)	1.626	0.654
	B	5(4.9)	5(10.4)	10(6.7)		
	AB	2(2.0)	1(2.1)	3(2.0)		
	O	69(67.6)	30(62.5)	99(66.0)		
Father's Occupation	Working	14(13.7)	42(87.5)	56(86.7)	0.042	0.757
	Not Working	88(86.3)	6(12.5)	94(13.3)		
	Illiterate	40(39.2)	13(27.1)	53(35.3)		
Father's education	Read & write	1(1.0)	0(0)	1(0.1)	7.206	0.125
	Primary	34(33.3)	15(31.3)	49(32.7)		
	Secondary	14(13.7)	15(31.3)	29(19.3)		
	University	13(12.7)	5(10.4)	18(12.0)		
	Illiterate	78(76.5)	38(79.2)	116(77.3)		
Mather's education	Read & write	1(1.0)	1(2.1)	2 (1.3)	3.234	0.357
	Primary	17(16.7)	9(18.8)	26(17.3)		
	Secondary	6(5.9)	0(0)	6(4.0)		
Socio-economic level	High	3(2.94)	4(8.33)	7(4.67)	0.389	0.823
	In-between	17(16.67)	19(39.58)	36(24.00)		
	Low	82(80.39)	25(58.08)	107(71.33)		

positive or negative were washing their hands before meals and after toilet. There was no

significant statistical relation between *H. pylori* infection and these habits.

Table 2: Relation between *H. pylori* with the drinking water source and some hygienic behaviors

Variables		(+ve) <i>H. pylori</i> n=102(68%)	(-ve) <i>H. pylori</i> n=48(32%)	Total (%) n=150(100%)	X ²	p-value
Source of drinking water	Tap	61(59.8)	30(62.5)	91(60.7)	0.124	0.940
	Wells	37(36.3)	16(33.3)	53(35.3)		
	Others	4(3.9)	2(4.2)	6(4.0)		
Hygienic behaviors	Hand wash before meals	101(99.0%)	48(100%)	149(68.1)	0.474	0.491
	Hand wash after toilet	76 (74.5)	32 (100.0)	108(72.5)	0.414	0.491
	Eating meals by hands	91(90.1)	45(93.8)	136(91.3)	0.545	0.416

Table (3) demonstrates high positive infection rates of *H. pylori* with different habits (smoking (96.1%),

chewing Khat (66.7%), and taking caffeine (85.3%). However, the results were not statistically significant.

Table 3: Relation between different habits and the *H. pylori* infection

Habits		(+ve) <i>H. pylori</i> n=102(68%)	(-ve) <i>H. pylori</i> n=48(32%)	Total (%) n=150(100%)	X ²	p-value
Chewing Khat	Yes	68(66.7)	36(75.0)	122(69.3)	1.066	0.302
	No	34(33.3)	12(25.0)	46(30.7)		
Smoking	Yes	98(96.1)	44(91.7)	142(94.7)	1.258	0.262
	No	4(3.9)	4(8.3)	8(5.3)		
Taking caffeine	Yes	87(85.3)	6(21.5)	93(62.0)	0.132	0.716
	No	15(14.7)	42(87.5)	57(38.0)		

DISCUSSION

The interest in rapid diagnosis of *H. pylori* has increased in recent years. To reduce costs, it has been proposed that endoscopy be reserved for patients with serious symptoms such as the weight loss, anemia suggestive of a bleeding ulcer or cancer and advanced age. On the other hand, it has been suggested that patients under the age of 45 years without serious symptoms be treated for their *H. pylori* infections and subjected to endoscopy only if still symptomatic after successful eradication therapy. Both of these approaches would benefit from a reliable rapid diagnostic test. For screening of dyspeptic patients, a test of high sensitivity is needed to ensure that positive individuals who should have endoscopies will not be missed. However, if treatment decisions are to be made on the basis of the test used, it is extremely important that the test is highly specific so that false-positive results and unnecessary antimicrobial therapy can be avoided. The Rapid Hp StAR (Dako Cytomation Ltd., United Kingdom) test is easy to perform; no special equipment is needed, the results are available generally within 10-30 min. and the test showed both high sensitivity and specificity.⁽¹⁶⁻¹⁸⁾

Helicobacter pylori is one of the most common chronic bacterial infections of humans and has a worldwide distribution. In this study, *H. pylori* was detected in 68% of the studied samples. Epidemiological studies strongly suggested that more than 50% of the world's population is colonized by *H. pylori*.⁽¹⁹⁾ However, the prevalence of *H. pylori* infection varies from 10% to 90%, depending on age, geographic location, and socioeconomic status of the populations.⁽²⁰⁾ In developing countries, the prevalence of *H. pylori* infection was found in more than 70% of the populations.⁽²¹⁾

In the Middle East countries like Turkey, the prevalence was 63% in the university students.⁽²⁾ In Arabian countries like Saudi Arabia, *H. pylori* was found in 31 % of the university students.⁽²²⁾ However, Yemen is one of the

developing countries with a high incidence of gastrointestinal symptoms and a high reported rates of sero-prevalence of *H. pylori* infection.⁽²³⁾ Many variations, including target population, bacterial strains, geographic locations, the efficacy of diagnostic methods, environmental, and socioeconomic factors (including related habits) could be contributory factors, which make it possible to interpret such differences.⁽²⁴⁻²⁶⁾

In a study of the prevalence of *H. pylori* infection in a rural area of the state of Mato Grosso, Brazil,⁽²⁷⁾ there was significant relation between the presence of *H. pylori* infection and age. On other hand in the present study, this relation was not found.

A study about the prevalence of *H. pylori* in a district in Turkey,⁽²⁾ found that most infected with *H. pylori* were living in an urban area. In this study, the samples were taken from the Faculty of Medical Sciences' students which is located in the urban district of Hodeidah Governorate irrespective of the origin of these students.

In the present study as well as in a study of Mansour-Ghannaei et al.,⁽²⁸⁾ to evaluate the prevalence of *H.pylori* infection among children in Rasht, Northern Iran, there was no significant difference between the sero-positivity rates of *H. pylori* infection and individuals' ages, gender or socioeconomic levels.

The association between water consumption and *H.pylori* infection indicates that *H. pylori* may be transmitted through a waterborne route.⁽²⁹⁻³¹⁾ *H.pylori* exists in two forms: the spiral form and the coccoid form.

Coccoid *H.pylori* is non culturable but alive⁽³²⁻³⁴⁾ Some researches have shown that *H. pylori* can survive water microcosms in coccoid form^(35, 36) The coccoid *H. pylori* in water has therefore been suspected to contribute an important part to the transmission of the bacteria. In the present study, the main two water sources consumed by the studied students were either tap or well water that showed no relation with *H. pylori* infection.

CONCLUSION & RECOMMENDATIONS

In the present study, high prevalence rates of *H. pylori* infection (68%) were detected among Medical Sciences University students. Periodic screening for *H. pylori* among students and other target population should be done to detect the prevalence rates and to correlate them with different demographic variables.

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