

Helicobacter pylori infection in asymptomatic subjects in Makkah, Saudi Arabia

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Abstract

Objective: To determine the seroprevalence of *Helicobacter pylori* antibodies in asymptomatic healthy population.

Methods: Convenient sampling was done in asymptomatic healthy individuals accompanying the patients who had no previous history of epigastric pain. Venous blood was collected from individuals and sera separated. Enzyme-linked immunosorbent assay (ELISA) was used to determine *H. pylori* IgG antibodies in all sera.

Results: A total of 396 samples were collected. *H. pylori* antibodies were found in 201 (51%) individuals. A 46% seroprevalence was found in subjects 15-20 years of age, which gradually increased with age and reached to 61% in subjects up to 50 years of age. Subjects > 40 years had higher antibody response than those < 40 years. There was no significant association between presence of *H. pylori* antibodies and dietary habits and sources of drinking water. *H. pylori* antibodies in female smokers were found in 9% and in non smoking females were 91% but no such difference was found in male smokers or non-smokers.

Conclusion: Infection with *H. pylori* is prevalent in the healthy individuals of Makkah, Saudi Arabia. Infection is acquired in the early age and reaches up to 61% as the age advances. A nation wide epidemiological study is warranted to determine the seroprevalence of *H. pylori* in Saudi Arabia (JPMA 57:114;2007).

Introduction

Helicobacter pylori is recognized to play a significant role in the pathogenesis of gastroduodenal diseases.¹⁻³ The prevalence of *H. pylori* infection varies between countries and races and depends on economic development of each country.⁴ The rate of new acquisition, (incidence) of *H. pylori* infection is approximately 3% per decade for adults in developed countries, which is far below the acquisition rate for children. In developing countries, most children become infected during the first 5 years of life, resulting in a high prevalence of *H. pylori* infection.⁵ In developed countries, *H. pylori* infection is less common in young children and increases with age and reaches 60% by adulthood.⁶

Seroepidemiological studies have indicated that infection with this organism is very common throughout the world.⁷⁻⁸ Antibody prevalence is significantly high in the developing countries, compared with industrialized nations.⁷⁻⁸ In developing countries, the seroprevalence of *H. pylori* among asymptomatic individuals ranges from 70-90%⁹⁻¹², while in developed countries it is about 50%.^{13,14}

There have been few reports from different parts of Saudi Arabia on *H. pylori* infection in patients with gastrointestinal diseases indicating a prevalence rate of 60-88%^{10,15-17}, but little information is available on the seroprevalence of *H. pylori* in healthy asymptomatic population.^{10,18} Therefore, the current study was designed to determine (a) the seroprevalence of *H. pylori* in asymptomatic healthy population, (b) see the age-distribution of *H. pylori*

infection, and (c) the possible relationships between *H. pylori* infection and factors such as gender, smoking, dietary habits and drinking water sources.

Subjects and Methods

Healthy individuals between the ages of 15-50 years were enrolled in the questionnaire based study. All subjects included in the study were residents of Makkah city, in good health with no symptoms referable to upper gastrointestinal tract.

Enrollees were asked questions on (a) did they consider themselves to be in good health (b) had they had any serious illness or surgery in the past two months (c) did they ever have gastric surgery or a peptic ulcer (d) did anyone in their immediate family have a peptic ulcer. In addition, each individual was questioned about the presence and frequency of upper gastrointestinal symptoms; the use of any medication during last two months, specifically antibiotics, bismuth-containing compounds or NSAIDs, and use of tobacco or smoking. Subjects were excluded if they had a history of peptic ulcer, frequent symptoms of upper gastrointestinal tract or if they used antacids or antibiotics regularly.

The study was carried out for six months from January - June 2003 in the following hospitals of Makkah; Hera Hospital, Al-Rafee Hospital, Alwi Tonsi Hospital and Al-Noor Specialist Hospital. The study subjects were among the family members and visitors of the patients admitted in these hospitals for various illnesses.

An informed consent was obtained from each individual before inclusion in the study. Each subject was informed about the procedure, making absolutely certain that he/she was fully competent of understanding the procedure and evaluating the risk factors involved. The subjects were aware of the fact that he/she could withdraw from the study any time, without any prejudice against him/her.

A total of 396 healthy individuals volunteered to participate in the study. From each individual about 5ml of venous blood was taken. The sample was allowed to clot at room temperature for about an hour, and then cooled in a refrigerator for 1-2 hours before being centrifuged. Sera were stored at - 70° C until analyzed.

The H. pylori IgG antibodies were determined at the Department of Medical Microbiology, Umm Al-Qura University, Makkah, by Enzyme-linked Immunosorbent Assay (ELISA). All sera samples were tested for qualitative H. pylori IgG antibodies using bioelisa HELICOBACTER IgG kit¹⁹ following the instructions given in the leaflet (BIOKIT, S.A. Barcelona, Spain).

Results

A total of 396 healthy asymptomatic individuals residing in Makkah, Saudi Arabia were enrolled in the study. Of these 196 were males and 200 females whose ages ranged from 15-50 years. The age distribution is shown in Table 1. The ELISA test detected IgG anti-H. pylori antibodies in 201 (51%) individuals. The overall seroprevalence increased with age. Subjects between 15-20 years of age showed 46% seroprevalence, while those between 21-40 years showed gradual increase (48-52%) with age and reached up to 61% in subjects between 41-50 years of age (Table 1).

When all subjects were grouped into those less than 40 and those over 40 years of age, a significant difference was obtained. H. pylori antibodies were detected in 153 (48%) of 317 subjects who were less than 40 years of age and in 48 (61%) of 79 subjects who were over 40 years of age.

Of 396 subjects, H. pylori antibodies were positive in 89 males (23%) and 112 females (28%) showing no signifi-

Table 1. Prevalence of anti- H. pylori antibodies in sera of 396 asymptomatic subjects according to age group.

Age Group (years)	No. of subjects examined	No. of H. pylori (+) subjects (%)
15- 20	113	52 (46%)
21-30	117	56 (48%)
31-40	87	45 (52%)
41-50	79	48 (61%)
Total	396	201 (51%)

Table 2. Age and gender correlation of H. pylori igg in normal healthy adults.

Age Group (years)	H. pylori IgG Positive Subjects			
	Male		Female	
	No. examined	No. of H. pylori (+) (%)	No. examined	No. of H. pylori (+) (%)
15- 20	82	38 (46%)	31	14 (45%)
21-30	46	17 (37%)	71	39 (55%)
31-40	35	16 (35%)	52	29 (56%)
41-50	33	18 (55%)	46	30 (65%)
Total	196	89 (45%)	200	112 (56%)

Table 3. Relationship of h.pylori infection with different parameters.

Parameters	No. of H. pylori antibody (+)	No. of H. pylori antibody (+)
	Male= (n=89)	Female= (n=112)
	No. (%)	No. (%)
Smoking		
Smoker	48 (54%)	10 (9%)
Non-smoker	41 (46%)	102 (91%)
Dietary Habits		
Eating vegetables	80 (90%)	104 (93%)
Not eating vegetables	9 (10%)	8 (7%)
Eating spicy food	70 (79%)	78 (70%)
Not-eating spicy food	19 (21%)	34 (30%)
Drinking Water Sources		
Zam-Zam water	1 (1%)	1 (1%)
Bottled water	11 (12%)	17 (15%)
Tap-water	39 (44%)	46 (41%)
Mixed sources	38 (43%)	48 (43%)

cant difference. However, when each age group was examined individually, a higher positive percentage of H. pylori antibodies (55-65%) increasing with age was seen in females between 20-50 years age group compared to males of same age group (37-55%) In age group 15-20 years the seroprevalence was almost equal in both males and females (Table 2).

The possible associations of smoking, dietary habits and drinking water sources on the frequency of H. pylori infection was also analyzed. There was no significant association between presence of H. pylori antibodies and dietary habits and sources of drinking water. However, a significant difference was found in H. Pylori antibodies in female smokers vs non smokers. Female smokers had a significantly low positivity for H. pylori antibodies (9%) vs non smokers (91%) (Table 3).

Discussion

In this study an overall prevalence of *H. pylori* infection was detected in 51% asymptomatic subjects examined. Similar results were shown in a study from Turkey²⁰ where 53% asymptomatic subjects were seropositive for anti-*H. pylori* antibodies. An earlier study from Riyadh, Saudi Arabia showed an overall 66% prevalence of *H. pylori* infection in asymptomatic subjects.¹⁰ However, recent studies from Libya¹¹, Nigeria²¹ and Tunis²² detected 76%, 80% and 83% of anti-*H. pylori* antibodies in asymptomatic subjects, respectively. A much higher seroprevalence rate of *H. pylori* (92%) in asymptomatic male subjects was reported from Bangladesh.¹²

An earlier study from Saudi Arabia¹⁰ found an increase in *H. pylori* seroprevalence with advancing age reaching to 70% for those of 20 years or more. In the present study there was a gradual increase in prevalence rate with age from 46% for those between 15-20 years to more than 60% for those between 41-50 years, but not as high as 70% (mentioned above) compared to 46% reported in this study. This clearly shows that the overall seroprevalence of *H. pylori* has decreased in this country from 66%¹⁰ to 51%. This may be due to transformation of the country from developing to developed status as reported in a study from South Korea²³ where decreasing trend in seroprevalence was found both in adults (from 70% to 66%) and children (40% to 17%) in recent decades.^{23,24}

In the developed world, prevalence of *H. pylori* infection rises with age and social class. In one study, seropositivity varied from 9% (age <30) to 67% (age >70).²⁴ It was concluded that most British adults infected with *H. pylori* probably became infected by household contact in childhood.²⁵

Our results showed a significant difference in the antibody responses to *H. pylori* between those <40 and >40

years of age. Subjects >40 years had higher antibody responses (61%). The similar phenomenon was found in other studies^{11,23} where asymptomatic subjects >40 years of age have shown 75- 85% seropositivity for *H. pylori*. This finding further substantiates the age of acquisition of *H. pylori* since infection with *H. pylori* is a long-term chronic infection.

In our study *H. pylori* seropositivity has shown increasing trend with age in females (55-65%) between age group 20-50 years compared to males of same age groups (37-55%), whereas other studies conducted in the region and other locations did not find any significant gender difference for acquisition of *H. pylori*.^{11,20} However, in another study attention was given to gender differences indicating that the prevalence of *H. pylori* infection was higher in men with upper digestive tract symptoms and non- upper digestive tract symptoms than in women.²⁶

There was no gender difference between *H. pylori* acquisition and dietary habits and drinking water sources of the population studied. However, 9% of the female smokers were positive for anti-*H. pylori* antibodies as compared to 91% who were negative and were non-smokers. This is because usually females do not smoke due to social and culture setup of the country.

In conclusion, this study revealed a higher seroprevalence of *H. pylori* in asymptomatic subject of Makkah, Saudi Arabia. A nation wide epidemiological study is warranted to determine the seroprevalence of *H. pylori* in Saudi Arabia. This in turn will open avenues for more studies about the risk factors and mode of transmission of *H. pylori*.

Acknowledgements

This research was supported by a grant from Umm Al-Qura University, Makkah, Saudi Arabia. We thank Ms. Najla Abdullah Bin-Obaed and Ms. Rowyada Ali Bakkri for helping in carrying out this study.

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