Helicobacter pylori infection in asymptomatic subjects in Benghazi, Libya

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Abstract: To determine the seroprevalence of Helicobacter pylori (H. pylori) antibodies in asymptomatic healthy population. 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 immunoflurescent assay (ELFA) was used to determine H. pylori IgG antibodies in all sera. A total of 79 samples were collected. H. pylori antibodies were found in 43 (54.4%) individuals. A 55.8 % seroprevalence was found in subjects 20 < 35 years of age, which gradually decreased with age and reached to 11.6 % in subjects up to 65 years of age. There was no significant association between presence of H. pylori antibodies and gender, marital status, dietary habits and sources of drinking water but relation with education level and wash hands was significant. Infection with H. pylori is prevalent in the healthy individuals of Benghazi, Libya. Infection is acquired in the early age and continues as the age advances. A nationwide epidemiological study is warranted to determine the seroprevalence of H. pylori in Libya.

Keywords: Asymptomatic, ELFA, Helicobacter pylori, Libya, seroprevalene, bacteria

Introduction

Helicobacterpylori *(H. pylori)* are Gram-negative micro-aerophilic, spiral, rod-shaped bacteria (1) and actively motile using 4-6 unipolar, sheathed flagella (2). *H. pylori* has an estimated prevalence of about half the world's population, it colonizes 70-90% of the population in developing countries where as it is 50% in developed countries (3). The overall prevalence is high in developing countries and lower in developed countries and within areas of different countries. The principal reasons for these variations involve socioeconomic differences between popul-ations. A lack of proper sanitation, of safe drinking water and of basic hygiene as well as poor diets and overcrowding, all play a role in determining the overall prevalence of infection (4). Transmission is from person-to-person, presumably oral-oral and/or faecal oral (5). The diagnostic tests for *H. pylo* infection can be divided into two categories: biopsy-based tests which are invasive tests because as they require gastroscopy, includes histological examination, culture, rapid urease test and molecular tests and non-invasive tests where no gastroscopy is required and the serum, whole blood, feces, expired air, saliva and urine are used for testing. Selection of the test depends on the purpose, sensitivity, specificity, cost-effectiveness, strategy and availability of the test (6). The infection induced cellular and humeral immune response in most patient's and measurements of specific antibodies in serum has been used as non- invasive method to detect *H. pylori* infection (7). Most people with *H. pylori* infection are asymptomatic, but a proportion of infected individuals develop severe gastro-duodenal disease, including duodenal ulcer, gastric ulcer and rarely gastric adenocarcinoma and gastric

mucosa associated lymphoid tissue (MALT) lymphoma (6). In healthy Libyan population, the prevalence of *H. pylori* infection is not well known and remains important for public health investigation because of high prevalence of this infection and its association with peptic ulcers and chronic dyspepsia (8). Epidemiological surveys usually use serological tests for high sensitivity and specificity which will not limit the accuracy of prevalence estimates. The aim of the study was to investigate the prevalence of *H. pylori* infection among asymptomatic healthy population and determination the epidemiological factors for the infection.

Materials and methods

This study was carried out on 79 healthy Libyan population attending to many polyclinics from different areas in Benghazi during the period from May to October 2014. Their ages ranged between 20 to 75 years. They consisted of 35 (44.3%) males and 44 (55.7%) females at various age categories (mean 40 year). Blood samples were taken from all the cases and sera were separated. Information was collected on structured questionnaire by interviewing each participant. The *H. pylori* IgG antibodies were determined at the department of laboratory, polyclinic (1) Al-Serti, Benghazi-Libya, by ELFA technique (Enzyme Linked Fluorescent Assay). All sera samples were tested for qualitative *H. pylori* IgG antibodies used the commercially available VIDAS*H. pylori*IgG (HPY) (BioMérieux Diagnostic, France, kit). Data were fed to the computer and analyzed using IBM-SPSS software package version 20. Comparison between different groups regarding categorical variables was tested using Chi-square test. Statistical significance was $P \leq 0.05$**.**

Results

In Table 1, A total of 79 asymptomatic subjects (age, 20-75 years) were enrolled in this study. Of them 43 (54.4%) subjects were tested positive and 36 (45.6 %) were negative for *H. pylori* antibodies. Their mean ± SD age was 40.76 ± 15.681 years. The age groups were as the following: (20 < 35 years, 55.8%), (35 < 50 years, 23.3%), (50 < 65 years, 9.3%) and (65 < years 11.6%) with no significant difference among them (p < 0.517).

Table 1: Relationship between age and HP infection

	***H. pylori* infection**				**Total (n = 79)**		**(p) Value**
	Positive (n = 43)		**Negative (n = 36)**				
	No.	**%**	**No.**	**%**	**No.**	**%**	
Age (years)							
20 < 35	**24**	**55.8**	**14**	**38.9**	**38**	**48.1**	**(0.517)**
35 < 50	**10**	**23.3**	**11**	**30.6**	**21**	**26.6**	

50 < 65	4	9.3	5	13.9	9	11.4	
65 <	5	11.6	6	16.7	11	13.9	
Total	43	54.4	36	45.6	79	100.00	
Min. – Max.	20.0 - 75.0						
Mean ± SD.	40.76 ± 15.681						
Median	36.0						

Table 2: Relationship between gender, marital status, occupation, level of education and HP infection.

	H. pylori infection				Total (n = 79)		(p) Value
	Positive (n = 43)		Negative (n = 36)				
	No.	%	No.	%	No.	%	
Gender							
Male	18	41.9	17	47.2	35	44.3	0.633
Female	25	58.1	19	52.8	44	55.7	
Marital status							
Single	18	41.9	11	30.6	29	36.7	0.299
Married	25	58.1	25	69.4	50	63.3	
Occupation							
Medical staff	18	41.9	8	22.2	26	32.9	0.369
Employee	6	14.0	5	13.9	11	13.9	
Student	4	9.3	5	13.9	9	11.4	
Free business	4	9.3	7	19.4	11	13.9	
House wife	11	25.6	11	30.6	22	27.8	
Level of education							
Illiterate	9	20.9	10	27.8	19	24.1	0.005
Primary	4	9.3	6	16.7	10	12.7	
Secondary	15	34.9	19	52.2	34	43.0	
High	15	34.9	1	2.8	16	20.3	
Total	43	54.4	36	45.6	79	100.00	

Table 3. Relationship between different parameters and HP infection

	H. pylori infection				Total (n = 79)		(p) Value
	Positive (n = 43)		Negative (n = 36)				
	No.	%	No.	%	No.	%	
Social economic							
Low	2	4.7	2	5.6	4	5.1	0.420
Good	39	90.7	34	94.4	73	92.4	
High	2	4.7	0	0.0	2	2.5	
Source of drinking water							
Tap	21	48.8	19	52.8	40	50.6	0.243
Well	0	0.0	2	5.6	2	2.5	
Municipality	22	51.2	15	41.7	37	46.8	
Place of life							
Rural	10	23.3	12	33.3	22	27.8	0.320
Modern	33	76.7	24	66.7	57	72.2	
Size of family							
1 – 4	2	4.7	0	0.0	2	2.5	0.120
5 – 8	5	11.6	5	13.9	10	12.7	
9 - 12	6	14.0	6	16.7	12	15.2	
Drinking coffee, tea							
Yes	32	74.4	26	72.2	58	73.4	0.826
No	11	25.6	10	27.8	21	26.6	
Smoking							
Yes	9	20.9	6	16.7	15	19.0	0.630
No	34	79.1	30	83.3	64	81.0	
Eat raw vegetable							0.226
Yes	30	69.8	20	55.6	50	63.3	
No	12	27.9	16	44.4	28	35.4	
Wash hands							
Yes	42	97.7	31	86.1	73	92.4	0.053
No	1	2.3	5	13.9	6	7.6	
Sharing articles							0.414
Yes	9	20.9	5	13.9	14	17.7	
No	34	79.1	31	86.1	65	82.3	

Discussion

In this study the prevalence of *H. pylori* infection in all participants was found to be 43 cases 54.4%. This indicates that about 54.4% of participants are at risk of development of *H. pylori* infection if they are not properly treated. An earlier study from Riyadh, Saudi Arabia showed an overall 66% prevalence of *H. pylori* infection in asymptomatic subjects. However, recent studies from Libya, Nigeria and Tunis detected 76%, 80% and 83% of anti-*H. pylori* antibodies in asymptomatic subjects, respectively (9), but our results disagreed with Switzerland 11.9%, Australia 20%, USA and Canada 30% (4). There is no statistically significant between age and *H. pylori* infection (Table 1), however the percentage decrease with age. These result agreed with Rana (10) and Alemayehu (11) but contrast with study in Kuwait which found the *H. pylori* infection percentage increase with age (12). Results in present study may be affected by the few number of participants. Thus, it is observed in this study both of genders appear to be equally exposed to *H. pylori* infection (Table 2), females had higher positivity (25 cases, 58.1%) than males (18 cases, 41.9%) ($p = 0.633$). This result agree with studies in Brazil(13), and disagree with a meta analysis indicated that male gender is a risk factor associated with infection (14). There is no significant relationship between marital status and *H. pylori* infection, these results agree with Rana (10) but the Libyan study showed a higher prevalence of *H. pylori* in married 84% than single subjects 68% (15). But spouse-to-spouse transmission has also a major role for *H. pylori* infection and continuous contact is required for the establishment of such infection (11). According to occupation there was no relation with *H. pylori* infection ($p = 0.369$). Our results disagree with Mohammad *et al.* who observed the role of occupation on HP seropositivities has significant differences (16). The highest group was medical staff in our study this may indicator to nosocomial infection. There is significant relationship between level of education and *H. pylori* infection in this study, However, as the level of education increases there is increase percentage in *H. pylori* infection among participants and these findings are agree with Alemayehu (10) but contrast with Rana (11) when the increase level education lead to decrease infection.

There is no significance relation between *H. pylori* infection and socioeconomic level ($p = 0.420$) (Table 3). These finding contrast a seroepidemiologic study in Mexico which showed low socioeconomic level was risk factor for the *H. pylori* infection (17). In Japan the fall in prevalence of *H. pylori* infection has been related to the significant improvement of the Japanese economy, and hence living conditions (18). Generally, the prevalence of infection varies in different societies and geographical locations, it also depends on the socio demographic character, socioeconomic status, hygiene and life style of the population). In present study *H. pylori* infection According to the source of drinking water suggests no statistical significant ($p = 0.243$). These result may contrast with scientific facts which proved the relation between *H. pylori* infection and source of drinking water, to small size of sample or contribute of other factors. In epidemiological studies, generally no association has been found between *H. pylori* infection and a water source in industrialized countries, possibly because of high quality water treatment. Water-borne transmission may occur in regions of the world where the quality of drinking water is low. The present results similar with a seroepidemiologic study of *H. pylori* infection in Mexico which showed the prevalence was similar in urban and rural community (17). But Sudanese study showed that there is a positive correlation between rural life and the presence of *H. pylori*

infection (19). No significant relation between *H. pylori* infection and size of family in this study (p = 0.120). This finding is similar to that of Rana (10). But difference with Libyan study who reported that transmission between siblings is an important mode of acquiring the *H. pylori* infection(16).No relation between *H. pylori* infection and smoke (p = 0.630). In another study which disagree with our results, El-Barrawy demonstrated that infection prevailed mostly 70% in smokers (20). The absence of association in this study might be due to less number of smokers. Besides the type and amount of tobacco has also an effect on the association. In present study there is no statistically significant between drinking (coffee, tea) and *H. pylori* infection (p = 0.826). In fact a higher percentage of positive *H. pylori* was found in those who drink coffee and tea 74.4%. Alemayehu observed the drinking coffee was also not associated in his study but it was positively associated in some studies with a justification that coffee intake supports the growth of *H. pylori* by suppressing acid production (11). Our result contrast with Rana who showed a significant finding of her study is that tea consumption is a protective factor by catechins in tea which has antibacterial activities (10). No relation between eating raw vegetables and *H. pylori* infection (p = 0.226). These results disagree with Saudi study which found the positivity of *H. pylori* infection in group of eating vegetables was 91.5% (9). There is a significant association in this study was found between washing hand, and *H. pylori* infection. Contrast results was reported in study in Ethiopia (11). Hands may serve as a potential vector of the infection. In rural Guatemala, carriage of *H. pylori* under fingernail was detected in 58% of studied persons by using PCR method (10). No statistical significance between sharing articles with others and *H. pylori* infection (p = 0.414). Ahmed et al. suggested that sharing cups, premastication of food for young children, sharing water for bathing and washing hands having a positive correlation with prevalence of *H. plori* (21).

In conclusion, the results of this work supported indirectly the hypothesis that *H. pylori* acquisition occurs early in childhood and persist throughout life. In addition, *H. pylori* infection appears to be multifactorial.

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