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EPIDEMIOLOGY OF HELICOBACTER PYLORI INFECTION AMONG THE HEALTHY POPULATION IN LEBANON

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ABSTRACT

Helicobacter pylori infection is probably the most important factor that has been associated with the development of gastric cancers in human populations. The purpose of this study is to estimate the prevalence rate and to explore the associated factors among the population living in Beirut and Lebanon South. Two hundred seventy one healthy individuals aged 1-80 years were screened for *Helicobacter Pylori by* using Chorus IgG assay. The mean age of the subjects was 38.1 years (±SD 13.95). The prevalence of *Helicobacter pylori* infection was 42.1 % in the subjects studied. A significant association is established between Gender and *Helicobacter pylori* infection. The prevalence of *Helicobacter pylori* infection was 1.5 times higher in men than in female. The *highest* prevalence rate was found in the age group [51-80 years]. However a very significant positive correlation was detected between Age and *Helicobacter pylori* infection. The *Helicobacter pylori* infection does not show any correlation with hyperinsulinemia, body mass index or waist *circumference.* The prevalence of *Helicobacter pylori* seems to be slightly lower in Lebanon than in Arab and Middle Eastern countries, but still need attention. An attention should be paid to diagnosis in order to treat *Helicobacter pylori* infection in older people.

KEYWORDS: Helicobacter *pylori;* infection; Lebanon; Prevalence.

INTRODUCTION

Helicobacter pylori is a gram negative spiral-shaped bacterium, first discovered by two Australian physicians, Barry Marshall and Robin Warren in 1982 (Warren, 1983), and represents a common bacterial pathogen that colonizes the gastric mucous layer or the epithelial lining of the human stomach (Marshall, 1984). This bacterium was initially classified as *Campylobacter pylori*, after which it was included in a new genus in 1989, namely *Helicobacter*, and accordingly renamed *Helicobacter pylori* (Goodwin, 1989). *H. pylori* is usually acquired during childhood through fecal-oral, oral-oral or gastro-oral routes, and has been shown to have a world-wide distribution (Brown, 2000). Infection with *H. pylori* causes inflammation of the gastric mucosa, yet most individuals remain asymptomatic. An estimated 20 to 30 % of the infected people subsequently develop diseases, including benign ones as peptic ulcer disease initially, but may consequently foster more serious morbidities such as gastric carcinoma or mucosal associated lymphoid tissue (MALT) lymphoma (Parsonnet, 1991; Wotherspoo,1991). *H. pylori* can be easily detected by noninvasive tests and effectively eradicated by a fast medical treatment. That being said, screening for and treatment of *H. pylori* presents a significant opportunity for preventive oncology (Brown, 2000; Parsonnet, 1991).

Previous studies and evidence-based reports have shown that countries of the developing world have higher prevalence rates of *H. pylori* infection than those of the developed one (Mitchell, 1992; Pounder, 1995). In addition, it has been estimated that up to half of the earth's human population harbor this germ in their stomachs (Brown, 2000). In Lebanon specifically, the prevalence of *H. pylori* infections is yet not very stood until now. One study showed that the percentage of this infection is about 52% of the total population, which is comparable to the other developing countries (Naja , 2012). In the region of North Lebanon in particular, the prevalence of *H. pylori* infection was found to be 25.9% among patients undergoing endoscopies, 60.8% in patients diagnosed with duodenal ulcer, and 72% in patients presenting with congestive enteritis (Kalaajieh, 2000).

In this present multi-center study, we aimed at evaluating the burden and magnitude of *H. pylori* infection in Lebanon through estimating the period prevalence, demographics of patients, and gastric diseases associated with this infection among patients admitted to different hospitals in two Lebanese regions, Beirut and South-Lebanon. We also compared our results to previous studies conducted nationally and Arab countries.

MATERIALS AND METHODS

This retrospective study was performed in different hospitals in Beirut and the south Lebanon over a period of four years (2011-2015). The study was approved by the research ethics boards at each hospital and conducted with informed consent. All investigations were performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

The target population comprised two hundred seventy one healthy individuals aged 1-80 years who were screened for *H. pylori*. Demographic data recorded for each individual included age, gender, BMI, waist *circumference and insulin*. All *H. pylori*-infected patients produce an antibody response which can be detected in the serum. For population screening, serodiagnosis method based on quantitative detection in serum of IgG antibodies to *H. pylori* was used for detecting the prevalence of infection. Serum antibodies against *H. pylori* infection were tested using Chorus *H. pylori* IgG assay.

Statistical analysis

Normality of the data distribution was checked by the Kolmogorov-Smirnov test. The Pearson test was used to to evaluate a significant correlation between two quantitative variables. The *Chi-Square* test (X^2 test) of Independence is used to determine if there is a significant relationship between two categorical variables. Satistical significance of differences for continuous variables was evaluated by Man Wittney test. Data are presented as means ± SEM. P-Values < 0.05, < 0.01, < 0.001 were considered significant. The statistical analysis was performed using GrapH. pylori ad Prism.

RESULTS

A total of 271 patients were screened. Individuals included 167 women (61.6%) and 104 men (38.4%) (table 1), aged 1–85 years. The mean age of the subjects was 38.1 years (±SD 13.95 years). The prevalence of *H. pylori* infection was 42.1 % in the individuals studied (table 2). H. pylori Ig G antibody positivity was detected in 60 of 167 women compared with 53 of 104 men. The prevalence of *H. pylori* infection was 1.5 times higher in men than in female (51.92%.and 35.93% respectively) (table1). Furthermore, a significant association is established between Gender and *H. pylori* infection (X^2=5.958; P value=0.0147) (table 1, figure 1).

A very significant positive correlation was detected between Age and *H. pylori* infection (R= 0.28; Pvalue <0.0001) (figure 2). However, the prevalence of *H. pylori* infection increased with age group (table 2). The prevalence of *H. pylori* infection was very high (69.81%) in the age group [51-80 years]; the age group [1-20 years] had the lowest prevalence (17.3%) (table 2). A significant association was detected between age group and *H. pylori* infection (X^2=28.08; Pvalue<0.0001) (table 2, figure 3)..

No correlation was found between *H. pylori* serologic status and hyperinsulinemia (R=0.023, Pvalue=0.152), body mass (R=-0.05; Pvalue=0.667) or waist *circumference* (R=-0.1371; Pvalue=0.529).

Figures

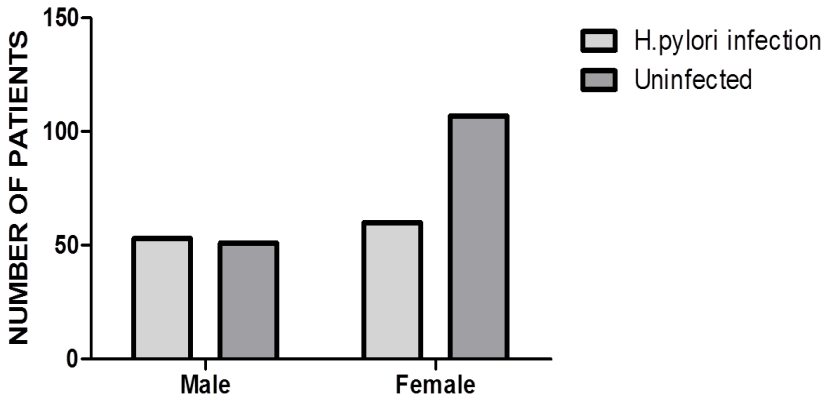

Figure 1. Distribution of individuals screened according to the presence or absence of *H. Pylori* infection and gender.

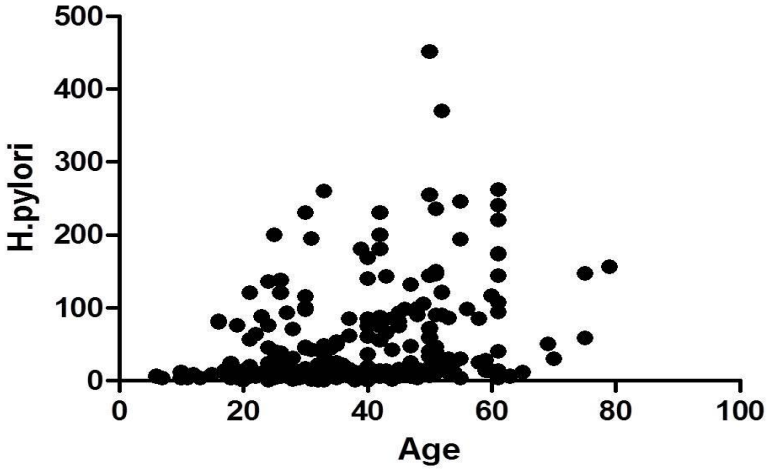

Figure 2. Significant Positive correlation between age and *H.pylori* infection

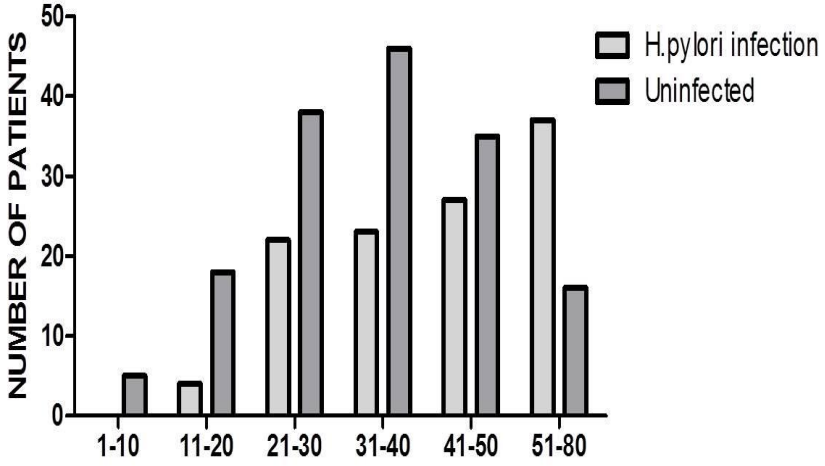

Figure 3. Distribution of individuals screened according to the presence or absence of *H. Pylori* infection and age group.

Tables

Table 1: Distribution of individuals screened according to the presence or absence of *H. Pylori* infection and gender.

	Male No (%)	**Female No (%)**	**Total**
H. Pylori infection	53 (51.92%)	60 (35.93%)	113
Uninfected	51 (48.08%)	107 (74.07%)	158
Total	104 (100%)	167 (100%)	271
Prevalence	51.92%	35.93%	
X^2=5.958 ; P value=0.0147			

Table 2. Distribution of individuals screened according to the presence or absence of *H. Pylori* infection and age group.

Age group	***H.pylori* infection**	**Uninfected**	**Prevalence**
1-10	0	5	0.00%
11-20	4	18	18.18%
21-30	22	38	36.67%
31-40	23	46	33.33%
41-50	27	35	43.55%
51-80	37	16	69.81%
Total	113	158	41.70%
X^2=28.08; P value<0.0001			

DISCUSSION

The prevalence of *H. pylori* infection varies between countries; the prevalence is up to 80% in developing and about 30% in developed countries (Atherton, 2006). In accordance with the results from the two previous studies in Lebanon (Naja, 2012; Kalaajieh, 2000), our study showed that *H. pylori* is highly prevalent in the Lebanese population, specifically in Beirut and South-Lebanon regions, with a period prevalence rate of 42.1%. Besides, the prevalence of *H. pylori* in our population, which is classified as a developing population, is lower as compared to the other developed and developing Arab countries. The prevalence of *H. pylori* infection in Jordan and Iraq was 77.5% and 78% respectively (Nemri, 2006; Hussein, 2008). In Kuwait and Egypt, *H. Pylori* was present in 84% and 86% of individuals, respectively (Al Qabandi, 2005; Mahmoud, 2006). In North African countries, the estimated prevalence in Libya, Morocco and Tunisia were 76%, 75.5% and 64%, respectively (Bakka, 2002; Mansour, 2010; Benajah, 2013). In other countries of the Persian Gulf region, the prevalence in the United Arab Emirates and Bahrain were 74%-78% and 79% respectively (Bener, 2006; Fakhro, 1999).

In our study, we have found that males are 1.5 times more prone to carry the infection than females. In Kuwait and Egypt, no significant difference was detected in the prevalence of infection between male and female individuals (Al Qabandi, 2005; Mahmoud, 2006). In a study conducted in Jordan, there was a clear tendencay that females were infected with less virulent *H. pylori*, but without significant correlation (Nimri, 2006). In another study in Western Saudi, the prevalence was significantly elevated in males *versus* females (Jaber, 2005). Actually, most studies showed no significant difference of *H. pylori* infection between women and men (Eusebi, 2014). This can be related to the difference in lifestyles between men and women in the Arab countries.

On the other hand, review of world literature reveals increase in the incidence of *H. Pylori* infection with age. In our study, higher numbers of *H.pylori* infection cases were found in the elderly population than in young adults in Lebanon, with an increase two times more. In Iraq, The prevalence of *H. pylori* increased clearly with age, the maximum value was 81.5% in adults with age 40-60 years (Hussein, 2008). The same situation was found in Saudi Arabia (Jaber, 2005). In Libya, overall prevalence was 67% with an increase with age 60-70: 83%; over 70: 94%. Study from Morocco also found a significant increase with age (Mansour, 2010). In Turkey (Novis, 1998), the global prevalence of *H. pylori* infection was 81%. There

is no noted difference in *H. pylori* prevalence in different ages. Accordingly, this pushes scientists and clinicians to conduct more research studies in this context.

In the literature, the association between *H. pylori* infection and obesity is controversial. In our study, we did not find an association between BMI or waist circumference and *H. Pylori*. While several cross-sectional studies have observed that BMI was positively and significantly associated with *H. pylori* infection, and an association was found between high BMI and an increased risk of the infection, the National Health and Nutrition Examination Survey (NHANES III) did not find an association (Cho, 2005).

Prevalence of *H. pylori* infection was significantly higher in diabetes as compared to controls in most studies (Longo-Mbenza, 2007; Quatrini, 2001; So, 2009), while some studies found no such association (Xia, 2001; Gasbarrini, 1998; Arslan, 2000). In our study, we did not find an association between hyperinsulinemia and *H. Pylori* infection.

Due to the scarcity in the number of studies conducted on *H. pylori* in Lebanon, it is of high importance to initiate future studies to further assess the burden of *H. pylori* infection in each Lebanese region, and as well to evaluate the correlation between *H. pylori* infection and its predictors as regards risk factors and daily life habits. It is also crucial to assess gastric cancer related to *H. pylori* infection in the Lebanese population, which will eventually point to the factors that present a risk in the development of this cancer, and hence lead to a decline in gastric cancer cases if reducing the risks is promoted. The prevalence of *H. pylori* in Lebanon is still high in the healthy asymptomatic population. Strategies should be implemented to minimize *H. pylori* infection.

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