Original Article

Prevalence and patient characteristics of *Helicobacter pylori* among adult in primary health care of security forces hospital Riyadh, Saudi Arabia, 2018

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ABSTRACT

Aim: To estimate the *Helicobacter pylori* prevalence and patients' characteristics in primary health care in security forces hospital Riyadh, Saudi Arabia. **Methods:** A cross-sectional study, using a fecal *H. pylori* antigen, is including adults (14-64 years) in the duration from 18 March 2018 to 18 April 2018 on Saudi male and female visiting Primary care center in Security Forces Hospital, Riyadh, Saudi Arabia. **Results:** The study came up with *H. pylori* prevalence is significantly correlated with age for those below 20 years and more than 50 years (*P*-value = 0.022 and 0.016, respectively) but with no correlation with the patient's sex. **Conclusion:** In conclusion, overall prevalence of *H. pylori* is low among primary healthcare patients, which is 10.2% and it is correlated to younger age <20 years old and elderly >50 years old.

Keywords: Adult, gastrointestinal symptoms, *Helicobacter pylori*, prevalence, Saudi Arabia

Introduction

Helicobacter pylori, which is a gram-negative microaerophilic bacterium and causes stomach inflammation, was first isolated by Barry Marshall and Robin Warren in 1982. It is a highly prevalent infection in the developing countries with poor socio-economic status and an etiologic agent of the majority of upper gastrointestinal diseases associated with significant morbidity.[1] More than 50% of the world's population is infected with *H. pylori*, the leading cause of chronic gastritis. Chronic gastritis is always associated with peptic ulcer and in advanced stages with an increased risk of developing gastric adenocarcinoma.[2]

H. pylori is a gram-negative organism which invades gastric mucosa or sticks to the epithelial lining of the stomach. Most of the patients will be asymptomatic but sometimes associated with abdominal distention, epigastric burning sensation, and nausea.[3] *H. pylori* are the most common cause of peptic ulcer disease, and it is one of the risk factors for gastric cancer. Treating the disease resulting in ulcer healing and reduce the risk of recurrence, and avoid it is complications. Treatment involves 10-14 days multi drugs including antibiotics and anti-acid.[4] In 1983, *H. pylori* were discovered as a cause of peptic ulcer disease.[5] A study done in Riyadh 2007 by AlMadi *et al.* found that *H. pylori* prevalence was 35%.[6] Another study done in Czech Republic 2006 by Bures J *et al.* found that the prevalence was 41.9% in males and 41.4% in females.[7] Other study was done in China 2010 by Li *et al.* a total of 3153 persons the prevalence of Helicobacter pylori infection was 73% in the total.[8] In 2010, in Kampala, Uganda a study done by Hestvik *et al.* found that the prevalence of *H. pylori* was 44.3%.[9] In India, the incidence of *H. pylori* was 79% through study done in 2010 by Thankachan *et al.*[10] In Brazil, August 2010,

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there was a study done by Dattoli *et al.* in which a total of 1104 children aged 4-11 years using anti_H pylori IgG antibodies, and the result was positive in 28.7%.[11] Also, there was a study done in United States 2011 May 2011 in which a total of 689 African American and white participants from the Southern Community Cohort Study participated and the prevalence was 79% of *H. pylori* seropositive which done by Epplein *et al.*[12] So there is a difference in the incidence of different geographic area which is higher in India and United States 79% and lower in Brazil which is 28.7% *H. pylori* should be treated to avoid its complications which includes ulcers that formed by the organism that can damage the epithelial lining of the stomach and allows to create the ulcer by the acidity of the stomach. Stomach cancer: *H. pylori* is one of the risk factors for gastric cancer.[13] Endoscopy is considered essential in the classification of the patient's condition as organic or functional dyspepsia.[14-18] The regimens that recommended by National Institute of Clinical Excellence for *H. pylori* eradication are omeprazole, amoxicillin, and clarithromycin (OAC) for 10 days; bismuth subsalicylate, metronidazole, and tetracycline (BMT) for 14 days; and lansoprazole, amoxicillin, and clarithromycin (LAC) for 10–14 days of treatment. In many of the developing countries, facilities for UGI endoscopy are rare. As a result, the diagnosis of UGI diseases is carried out solely on clinical parameters in most cases. Incorrect/delayed diagnoses, and subsequent ineffective management results in increased morbidity, economic loss to the client, and even death especially in patients with malignancy.[17] Therefore, the goal of this study is to try to find out the prevalence of *H. pylori* and patient's characteristics among SFH visitors, to compare it with the currently available studies.

Materials and Methods

Study population

Saudi male and female adults aged 14-64 years visiting Primary care center in Security Forces Hospital during the year 2018.

Inclusion criteria

Saudi male and female

Adult 14-64 years

Patients who are complaining of gastrointestinal symptoms.

The patient did not receive treatment for *H. pylori* or received the therapy more than 12 months.

Exclusion criteria

Patients who could not effectively communicate in Arabic

Less than 14 years

Older than 65 years

Received treatment within 12 months.

Sample size and technique

Using the expected prevalence of *H. pylori* was reported 35% as given in the literature for calculating our sample size. Under the convenient sampling with a margin of error at 5% and the confidence level at 95%, we will need a sample of size 350. Allowing for 15% non-response rate the final required sample size is 411.

We use the following formula

$$n = (Z^2 P (1 P))/d^2$$

where n = sample size, the $z = z$ statistic for the level of confidence, P = expected prevalence and d = allowable error. This formula assumes that "P" and "d" are decimal values.

Study area

Primary Care Center, Security Forces Hospital, Riyadh Saudi Arabia

Study duration

18 March 2018-18 April 2018.

Study design

A cross-sectional study, using a stool *H. pylori* antigen as a diagnostic test Included Adults (14-64 years) in 2018.

Results

Of 411 participants there was 143 (34.8%) aged 21-30 years, 96 (23.4%) aged 31-40 years, 72 (17.5%) aged >50 years. Most of them were females 281 (53%). Most of them were *H. pylori* negative 369 (89.8%) [Table 1].

This study showed that *H. pylori* prevalence is significantly correlated with age <20 and >50 years old (*P*-value = 0.022 and

Table 1: Descriptive statistics	
	Description (*n*=411)
Age	
Range	14 - 64
Mean±SD	35.3±12.8
Median (IQR)	32 (25-47)
Age (years)	
≤20	38 (9.2)
21-30	143 (34.8)
31-40	96 (23.4)
41-50	62 (15.1)
>50	72 (17.5)
Sex	
Male	193 (47)
Female	218 (53)
H. pylori	
+VE	42 (10.2)
−VE	369 (89.8)

Table 2: Demographic determinants of *H. pylori* infections			
	H. pylori		*P*
	+VE (*n*=42)	−VE (*n*=369)	
Age			
Range	22-64	14-64	
Mean±SD	41.9±12.1	34.5±12.7	<0.001@
Median (IQR)	43 (32-52)	31 (24-45)	
Age (years)			
≤20	0 (0)	38 (10.3)	0.022*
21-30	9 (21.4)	134 (36.3)	0.055*
31-40	11 (26.2)	85 (23)	0.647*
41-50	9 (21.4)	53 (14.4)	0.225*
> 50	13 (31)	59 (16)	0.016*
Sex			
Male	17 (40.5)	176 (47.7)	0.374*
Female	25 (59.5)	193 (52.3)	

*Chi-square test, @*t*-test

0.016, respectively) but there was no correlation between *H. pylori* prevalence and sex [Table 2].

Discussion

H. pylori infection has been recorded to be hyper-endemic in Saudi Arabia. Some studies on *H. pylori* in the Kingdom of Saudi Arabia have observed a high prevalence in various age populations, including individuals with non-ulcer dyspepsia.[19] More reviews on *H. pylori* infection among Saudi children had shown high infection prevalence among Saudi children in the cities of Riyadh and Jeddah.[20] The World Health Organization considers *H. pylori* as a carcinogen.[21] It has been reported that prevalence of infection with *H. pylori* accounts for 75% of non-cardia gastric malignancy worldwide.[22] The *H. pylori*-induced gastritis may lead to atrophic gastritis. Atrophic gastritis may progress to intestinal metaplasia, dysplasia and neoplasia, gastric adenocarcinoma and mucosa-associated lymphoid tissue lymphoma.[23] Although there are many types of research on *H. pylori* prevalence conducted in different regions of Saudi Arabia.[24-28]

The present study shows that the *H. pylori* prevalence was significantly higher in the older-age-group >50 years (13, *P* = 0.016) while there was no infection in young age <20 years (0, *P* = 0.002). This observation agrees with a large British study that examined patients tested with the urea breath test. The patients in this British study were randomly drawn from general practice registers, and some were not included because of dyspeptic symptoms. The study also found that *H. pylori* infection in primary care patients was strongly related to age.[29]

Akeel *et al.* (2018) carried out a prospective cross-sectional study, a total of 404 gastric biopsies were endoscopically carried out on 404 patients with dyspepsia from September 2014 to April 2016 (Jazan Province, Saudi Arabia). The study indicated that there is a high prevalence of *H. pylori* among Saudi patients with dyspepsia. Prevalence of *H. pylori* was high in ages <55 years.

Chronic active gastritis was significantly related to *H. pylori* infection.[30]

Another study by Telmesani (2009) found that the prevalence of *H. pylori* among the school children in Makkah, Saudi Arabia, is relatively low compared with developing countries. The prevalence was found to be higher among the younger age group. Further, there was a significant relation between *H. pylori* infection and chronic recurrent abdominal pain among the school students.[31]

Previous studies reported that the prevalence of infection in younger patients was ranged between 10% and 20%,[32,33] it is anticipated that the incidence of *H. pylori* infection will decline as sanitary conditions improve and\ it is also considered a reflection of widespread use of antibiotics.[34] *H. pylori* infection has been frequently reported by several studies to be high in developing countries and associated with low levels of education and social, economic status, and poor sanitation.[17,35] Impact on endoscopic findings while the presence of *H. pylori*, smoking and alcohol consumption are all associated with an increased risk level of developing chronic gastritis.[35]

The overall prevalence of *H. pylori*-associated gastritis may be an underestimate since the majority of the participants had been on prior treatment with antibiotics. However, this value is almost similar to one found by Wabinga *et al.*[36] in his retrospective study in 2002.

In contrast, studies in 2012 in neighboring Kenya[37] reported a 52% prevalence of *H. pylori* in adults.[38] In Nigeria, a 41% prevalence was also published in Lagos state in 2008.[35] Notably, all the above researches were carried out in an urban setting where there is congestion, perhaps sub-optimal sanitary conditions but easy access to antibiotics compared to rural settings. In the East Cape region of South Africa in 2008, 66.1% *H. pylori* prevalence was reported.[39] The East Cape region is one of the most deprived areas of South Africa. Clinicians have to be always aware that dyspepsia in the young could be cancer.[40]

In a systematic review carried on 4,018 patients, the use of alarm symptoms to select dyspeptic patients for endoscopy caused participants with early curable cancers to be overlooked.[41] The most familiar macroscopic finding was gastritis similar to the following studies, Wabinga *et al.* in Uganda,[36] Sang Thomas *et al.*[31] and Kimang *et al.*[38] In Kenya, Sang Thomas *et al.* found about 4% normal findings at endoscopy and Kimangi *et al.* found that 100% of the study patients with dyspepsia had abnormal results at endoscopy. In the Eastern Cape region S.A, 33.6% of the patients had functional dyspepsia.[38] Similarly, Abioudun *et al.* in Nigeria stated that gastritis was the most frequent finding, but also found a high prevalence of *H. pylori* in endoscopically typical study participants.[42] In contrast, in Italy, a case-control study by Zagari *et al.* of 1033 study participants found that — were normal endoscopically. In his research, about 93.4% of PUD patients had *H. pylori* at histology.[43]

One weakness in our study is the fact that patient selection is somewhat inhomogeneous, and at the discretion of the GP, therefore, there are no firm inclusion and exclusion criteria. However, the study aimed to illustrate how test-and-treat could be applied successfully in the clinical setting of primary care. In both the women and men who were <20 years of age, we found a significant decline in *H. pylori* prevalence over the years of the study. This corresponds with recent studies that reported a general decrease in *H. pylori* infection in developed countries.[44,45]

Conclusion

In conclusion, *H. pylori* prevalence is low among the primary healthcare of Security Forces Hospital, Riyadh Saudi Arabia and highly correlated to old age and elderly >50 years old.

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Conflicts of interest
There are no conflicts of interest.

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