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Prevalence of *H.pylori* in the Arab world

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الملخص:

الهدف:هدفت هذه الدراسة لدراسة معدل انتشار الملتوية البوابية بين المرضى الذين يعانون أعراض و الا صحاء في العالم العربي. حيث تشكل بكتيريا الملتوية البوابية مشكلة صحية حقيقية

الطريقة: تم إجراء بحث محوسب شامل في اللغة الإنجليزية لأبحاث بوب ميد، سكوبوس، و غوغل سشولار في أبريل 2016، لتقييم معدل انتشار بكتيريا الملتوية البوابية في البلدان العربية .النتائج: بعد البحث الالكترونى تم الحصول على 100 ورقة وبعد تقييمها 44 ورقة وجدت مناسبة لتتضمن فى دراسة المراجعة هذه الخلاصة: هذه المراجعة أظهرت ارتفاع معدل انتشار بكتيريا الملتوية البوابية بين الناس سواء كانوا يعانون من أعراض او بدون أعراض في العالم العربي، وينبغي بذل التدخل الفوري فيما يتعلق بتحديد والاستئصال والوقاية من هذه البكتيريا.

Abstract:

Aim: To investigate prevalence of *Helicobacter pylori* (*H. pylor*i) among healthy asymptomatic and symptomatic patients in the Arab world. Where *H.pylori* infection constitutes a real heath problem.

Methods: A computerized comprehensive English language literature search of Pub Med, Scopus, and Google scholar was carried out in April 2016, evaluating the prevalence of *H.pylori* in the Arab countries.

Results In the electronic search, a total of 100 papers were initially identified. And after evaluating the titles, abstracts and full text of relevant articles.44 papers were included in this review

Conclusion: This review demonstrated high prevalence of *H.pylori* infection among symptomatic and asymptomatic people of the Arab world, immediate intervention should be made regarding identification, eradication and prevention of this bacterium.

Keywords: Prevalence, *H.pylori*, infection, Arab World

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Introduction:

Helicobacter pylori (*H.pylori*) are gram negative, curved, micro-aerophilic, spiral, rod-shaped bacteria, which have significant health problem worldwide [(1)]. *H.pylori* are responsible for infecting over 50% of the world's population and humans are considered the only reservoir of infection [(2, 3)]. The prevalence of *H.pylori* differs greatly between and within countries, with high rates of infection being associated with low standards of living, poverty and overcrowdings. Gastritis, peptic ulcer, gastric carcinoma and mucosa associated lymphoid tissue (MALT) lymphoma are recognized sequels of *H. pylori* infection [(4,5, 6)]. Most of infected individuals remain asymptomatic; though , 15-20% will develop symptoms of peptic ulcer disease [(7,8,9)].The exact mode of transmission of infection is unknown; however the direct contact between people is considered the main route of contracting *H.pylori* infection by either the oral-oral route or the fecal-oral route [(9)]. Although the rate of infection in the developed world has markedly reduced [(11)], seroprevalence of *H. pylori* has risen to 93.6% among adults in developing countries [(12)]. In developed countries many studies demonstrated that subjects are infected with *H. pylori early* in childhood (<5 years of age) and that the risk of infection is reduced after that [(13,14,15,16)]. There is strong believes that the risk of acquisition of *H. pylori* can be reduced by implementation of adequate sanitary measures [(17)]. The diagnosis of *H. pylori* infection can be confirmed by either invasive (Rapid urease test, culture and histology) or non-invasive tests (serology, stool antigen, urea breath test) [(18)]. Arabian compound states are being the central and transcross of the world. It is composed of around nineteen countries and inhabited by more than 350 million; they all speak Arabic language and mostly they share the same traditions[(19)]. *H .pylori* infection is an important issue in all Arab countries; and the estimated prevalence among infected individuals in group of Arab countries of Eastern Mediterranean region ranged from 22% to 87.6% [(20)].

Understanding the prevalence of *H.pylori* could be an essential step for effective intervention regarding the management and prevention of this bacterium. Therefore this study aims to investigate the prevalence of *H.pylori* in the Arab world, in the hope to help care givers and policy makers to set precise therapeutic strategy for patients infected with this pathogen.

Methods:

The presented data in this review was obtained in April 2016, by searching, the literature in Pub Med, Google Scholar and Scopous databases. The prevalence, *H.pylori*, infection and names of each country were applied as key words in titles and no time limitation was applied. All the publications which had assessed *H.pylori* infection (descriptive/analytical cross-sectional, case-control, and epidemiological studies, as well as cohorts with appropriate methods) were included in this review article and studies on pediatric age group (age < 18 years) were also included. *H. pylori* was detected using anti- IgG H. pylori, urea breath test(UBT), stool antigen, saliva anti- IgG H. pylori or endoscopy/biopsy. The data

that has demonstrated co-infection with other infectious diseases as well as studies on animal models were excluded from this review article.

Results:

In the electronic search, a total of 100 published papers were initially identified. After a review of titles, abstracts and assessment of the relevance and validity of papers, a total of 44 relevant papers were included in our review article.

***H. pylori in Arabian Peninsula Region*:**

This region constitutes about 35% of the Arab world and is composed of Saudi Arabia, Yemen, Oman, Qatar, Bahrain, UAE, and Kuwait. In Saudi Arabia which is the biggest country in this region, the prevalence of *H.pylori* infection was noted to be varied from 32.4% in those ages <10 years to 75% among those aged > 50years. The prevalence was also reported as 51% and 28.3%, among asymptomatic healthy individuals in Makah and Al Madinah respectively, [21,22, 23] . Another study conducted among adult patients with dyspeptic symptoms demonstrated the prevalence of 85.7% among patients who presented with symptoms suggestive of gastritis or peptic ulcer disease [24]. In a study carried out to investigate seroprevalence of *H. pylori* among healthy adolescent population in three regions of King Saudi Arabia showed a prevalence of 47%.[25].Furthermore a prevalence of 27.4% was detected among school children aged 7-18 years[26].

In Kuwait Alazmi et al has reported the prevalence of H.pylori among patients with dyspepsia as 49.7% using urea breath test, [27]. In another study, the rate of H.pylori infection was detected in 84% of Kuwaiti patients with dyspeptic symptoms using histopathoogical diagnosis. [28,29]

In Oman a prospective endoscopy–based study was conducted among patients with gastritis showed a rate of infection as 30.1 %[28], though in another study conducted among healthy asymptomatic blood donors the prevalence was reported as 69.5 %[30]. The Prevalence of Helicobacter pylori infection among Yemenis patients who underwent upper gastrointestinal tract endoscopy in Sana'a major hospitals was found to be 99.6 % .Similarly the rates of *H.pylori* infection in endoscopy-based study among patients with different gastrointestinal disorders was estimated by 98.7%,.[31, 32]. However another report in (2004) showed overall 82.2% prevalence rate of *H. pylori* infection among patients with dyspepsia [33]

In Bahrain the rate of infection accounted for 62% and 36% in obese and non obese patients respectively.Another study showed a prevalence of 79% among patients with dyspeptic symptoms [34, 35].

In the United Arab Emirates the prevalence of *H.pylori* infection was found to be 74.2% among general population and 78.4% among industrial workers. In addition, the prevalence was detected in 90.5% and 88.9% in endoscopy- based studies undertaken among patients with dyspepsia and perforated peptic ulcers respectively [36-40].

In other less populated gulf countries like, Qatar *H.pylori* infection was reported as 77%in a study using histological examination for detection of *H.pylori in* 574 patients who underwent Oesophago- gastroduodenoscopy [41].

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Table (1): Shows Prevalence of *H.pylori* in the Arab world by countries:

Country	Age	Prevalence	Diagnosis
Saudi Arabia	15-50years	27. 4-69.3%	Serology, Histology
Kuwait	20-39years	49.7%-96%	13C-urea breath tests Histology
Bahrain	27-78years	36%-7&%	RUT,, Histology
UAE	Any age group	74.2%-90.5%	Histology , serology
Yemen	16-90 years	82.2%-98.7%	Histology, serology
Qatar	14 t-90 years	77%	Histology
Oman	15-59years	30.1 %-69.5%%	Histology , serology
I rag	18-65years	55.8%-81%	serology
Jordan	15-91years	44%-82%	Histology, PCR
Lebanon	1-17years	21%	serology
Palestine	3-77years	48.3%-49.7%	Serology , RUT, Histology
Egypt	1-87years	72.4 %-91.7%	Serology , RUT
Sudan	15-60years	21.1%-80%	Serology and Histology, RUT
Libya	1-70%	50%-94%	Serology. Histology , RUT
Tunis	5-55years	30.4%-99.3%	serology
Algeria	5–65 years	43–92	Serology
Morocco	20-80	69%.-75.5%	Histology , RUT, Culture
Mauritania	5 to 76	76,%	serology

Prevalence of H. pylori in Sham Region:

This region is composed of Syria, Iraq, Lebanon, Jordan, and the existing part of Palestine in Jordan, the prevalence of *H.pylori* infection was observed in 82% among patients with Gastritis at the North of Jordan. Though, recently Nimri *et al has* reported the

prevalence of *H.pylori* as 44% among patients with dyspepsia using polymerase chain reaction(PCR).[42,43]

In Iraq, the prevalence of *H.pylori* was found to range between 27% among those aged 6-24 months to 81.5% among adult who aged (40-60 years) Also sero- prevalence of *H.pylori* was noted in 55.8% among apparently healthy university students and the prevalence was found to be higher in older group of studied students and those from low social class 61.7%[45] In the study undertaken among patients with gastritis the rate of infection was determined as 81%, 52.2% and 67.2 % using serum (IgG) anti-*H. Pylori* antibodies, culture on Columbia agar and rapid urease test respectively. [46]

In Lebanon the rate of *H.pylori* seropositivity was observed as 36.8% among asymptomatic Lebanese children aged 10-17 years ,however reached up to 52% in asymptomatic adult Lebanese[47,48].

In Palestine, a study from Gaza Strip, where a prevalence of infection with *H.pylori* was noted in 48.3% of asymptomatic general population and a similar rate of infection 49.7% was found among Arab children aged 3-5 years in Israel[49,50].

H. pylori in River Nile Region:

This region consists of Sudan and Egypt as they are resting on the Nile River.

In Egypt H.pylori a prevalence of 91.7% was reported among asymptomatic general population. Likewise in apparently healthy school children the overall prevalence of H. pylori infection was accounted for 72.4 %. On the other hand a study conducted among dyspeptic patients showed the prevalence of H.pylori as 82.9 % [51,52,53].

In Sudan there are little informations regarding the prevalence of H.pylori. An earlier report using rapid urease test and culture to diagnose H. pylori infection showed a prevalence of 80% in patients with gastritis and 56% in patients with duodenal ulcer.[54]

In another study, the overall prevalence of H. pylori was detected to be 21.1% and 63.3% using IgM and IgG respectively among patients with dyspeptic symptoms.[55] recently. We have also found an overall prevalence of 65.8% in symptomatic Sudanese subjects in eastern Sudan. [56]

***H. pylori* in North African (Maghreb) Region:**

The Arabian North African countries include Libya, Tunisia, Algeria, Morocco, and Mauritania, (Mauretania). The prevalence of H.pylori among different populations at Maghreb countries is variable. In a study conducted among asymptomatic general population, the prevalence of *H.pylori* in Libyan children aged 1-9 years was found to be 50%, however, the prevalence rose to 84% in those aged 10–19years and reaching up to 94% among adults>70years.In another study *Bakka et all* has reported 82%prevalence of H.pylori infection in patients with dyspeptic symptoms.[57,58]

In Tunisia, sero- prevalence of *H.pylori* was reported as 64 % among healthy blood donors and has reached up to 99.3% in symptomatic patients [59]. In another two different studies

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conducted among healthy Tunisian children, *H.pylori* seropositivity was detected in 30.4% and 51.4 respectively [60, 61].

In Morocco, a study was carried out among 429 of dyspeptic patients, showed the prevalence of H.pylori infection in75.5% [62].

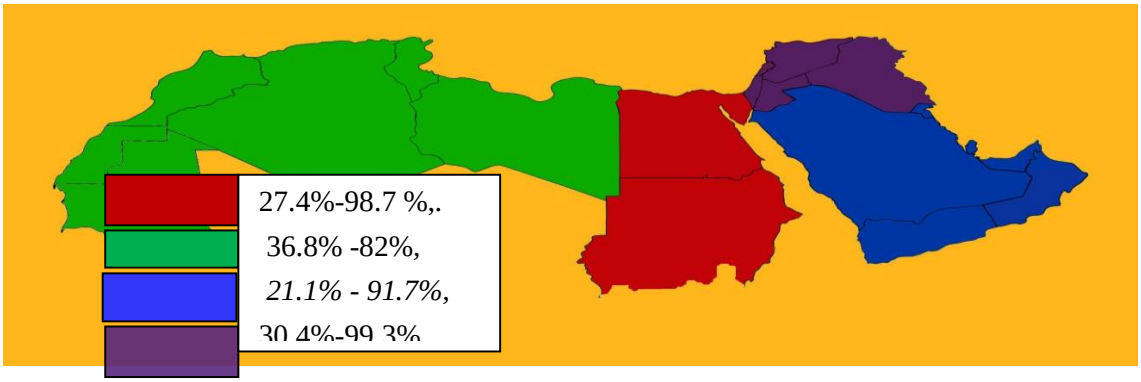
In Morocco the prevalence rate of 69% was also identified from laboratory records at the Pasteur Institute, Morocco from 1998 to 2007 among 755 patients with dyspepsia.[63]

In Algeria, among Algerian children, the prevalence of *H.pylori* infection was found to be 43%, which rose to 92% among those who aged 40-49years [64]

In Mauritania, the seroprevalence of *H.pylori* was 76.4% among asymptomatic Mauritanian population [65].

Discussion:

Arab World constitutes the major division of the Mediterranean basin up to the Atlantic cost in the west and Indian Ocean in the south east and ranging from rich oil producing countries to poor countries. The African region consists of the whole North African countries which are composed of approximately 23% of Africa, and the Asian region that composes around 10% of Asia. There are different standards of living, levels of developments and priorities. Heath systems are variable among these countries; some of them succeeded in implementing sufficient guidelines for infection control, however, many others are still lagging behind and failed to adjust such recommendations. Many studies have shown that the prevalence of *H.pylori* infection in these countries was high and almost similar to each other. Since *H.pylori* are a leading cause of Gastric cancer and mucosa associated tissue lymphoma (MALTOMA) in human being, understanding the prevalence of *H.pylori* would be of great interest particularly in developing countries where, the incidence of gastric carcinoma is frightening[66]. Based on the aforementioned reports, it seems that the prevalence of H. pylori range was (27.4%-98.7 %,), (36.8% -82 %,), (21.1% - 91.7%) and (30.4%-99.3%). (In the Peninsula, Sham, River Nile and Maghreb regions respectively (Figure 1).



Abbreviations: (RUT) Rapid urease test, PCR (polymerase chain reaction)

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This clearly shows that the overall prevalence rate of *H. pylori* infection was high and comparable between these regions, and was also consistent with studies conducted in other countries like, (Iran 85%), (Turkey 81%.) and (Pakistan 69.3%) [67] .This review showed high rates of *H. pylori* infection among the countries studied which is in agreement with other reports and may be attributed to lack of inadequate sanitation, overcrowdings as well as bad hygienic practice Also this review revealed that the frequency of *H.pylori* infection increases with advancing age which is consistent with other studies worldwide [68].

In this study, we reviewed the *H. pylori* infection among symptomatic and asymptomatic population of the Arab world, where the prevalence of *H.pylori* was found to be higher among symptomatic patients than healthy individuals. Similarly Zagari *et al* in Italy have found the prevalence of *H.pylori* among patients with Peptic ulcer disease as high as 93.4%[69]. Two other studies conducted in Nigeria, showed prevalence rates as high as 64% and 94.5% respectively[70,71]. In Ethiopia the prevalence was reported as 72.2% among patients with dyspeptic symptoms [72]. By contrast studies obtained from Bangladesh and Turkey showed a high prevalence of infection among asymptomatic people (90% and 70%) respectively [72, 73]. Although the prevalence of *H.pylori* infection is slightly lower in studies conducted in Sham region, this may be attributed to lack of published of reported data in a country like Syria, where a civil war represents a major reason or barrier . The present review also demonstrated asignificant variation in the prevalence of *H.pylori* infection from one country to another in the same region, which may be explained by using different testing techniques for the diagnosis of *H. pylori* infection.

Limitations:

The main limitation of this narrative review was the unavailability of data regarding the prevalence of H. *pylori* ,this might be attributed either to people displacement due to civil war as in the case of Syrian population, or may be due to lack of researches on *H.pylori*.

Furthermore, heterogeneity was noted among studies included in this review as these reports differs in many ways, including diagnostic tests, sample sizes and socio-demographic characteristics of studied population. All these might lead to discrepancy in the results of these studies.

Conclusions:

The prevalence of *H.pylori* infection in the Arab world is alarming and needs urgent consideration. The prevalence of *H.pylori* infection in the majority of the above mentioned studies appears to be higher in symptomatic patients as compared to asymptomatic individuals. Furthermore, the patients with evidence of dyspeptic symptoms are more likely to be *H.pylori* positive than those without. Also this study revealed that the prevalence of infection increased with advanced age.This inclusive review also demonstrated that many other countries have no published information regarding the prevalence of *H. pylori* infection, therefore many efforts should be directed towards the identification, treatment and prevention of this pathogen.

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