

## ***Helicobacter pylori*: The Middle East Scenario**

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A review of *Helicobacter pylori* in the Middle East is presented. Prevalence studies have been performed in asymptomatic population groups from Algeria, Israel, Saudi Arabia and Turkey. These showed that the prevalence of *H. pylori* is similar to that of the developing countries of the world with a high level of infection in childhood (40 to 70 percent), which increases with age to 85 to 90 percent. Israel, however, has a low prevalence in children (10 percent), but there is a rapid rise in the second decade of life to 39 percent, reaching 79 percent in those over 60 years old. The prevalence rates were higher in those living in communal settlements (72 percent) than in urban dwellers (65 percent). The infection rates were higher in persons of Mediterranean and Asian origin (89 percent) compared to those of Western European/North American origin (57 percent). The prevalence rate of *H. pylori* infection in patients undergoing endoscopy for upper gastrointestinal symptoms has now been reported from many Middle Eastern countries, including Egypt, Iran, Israel, Oman, Saudi Arabia, the United Arab Emirates and Yemen. These studies showed that patients with gastritis and peptic ulcer disease had similar rates of infection as reported from Europe, United States and Africa (71 to 92 percent). However, patients with non-ulcer dyspepsia had higher rates of infection (61 to 89 percent). The *H. pylori* scenario from the prevalence rates, treatment protocols and responses to treatment does not differ very much from other developing areas of the world.

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### **INTRODUCTION**

The prevalence of *Helicobacter pylori* infection as shown by large epidemiological prospective studies in an asymptomatic population [1-10] and its prevalence in various upper gastrointestinal conditions [11-15] has been reported in numerous countries throughout the world, including those in the Middle East.

Countries in the world may be divided naturally into two groups—the industrialized developed countries at a high socio-economic level, and those developing countries whose populations live in poor socio-economic conditions. In a similar fashion, the prevalence of *H. pylori* in different countries can generally be divided into two groups [16]. The first consists of countries whose population has a high prevalence of infection in children, persisting into adult life and old age, while in the second group, the prevalence in childhood is low, but rises with age.

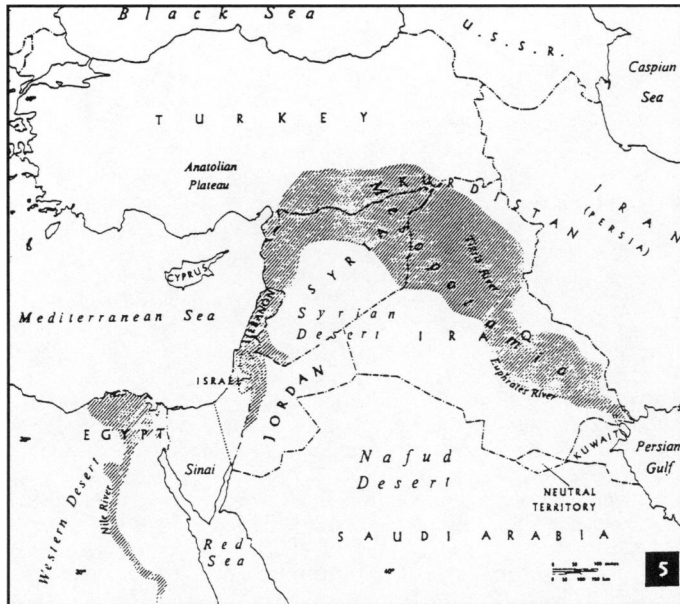
Where do the countries of the Middle East fit into this spectrum?

### ***H. PYLORI* IN THE MIDDLE EAST**

The Middle East is a region which is difficult to define precisely. For the purposes of this study, it includes the countries of the ancient fertile crescent (Figure 1), the Arabian peninsula and the North African countries bordering the southern shores of the Mediterranean Sea.

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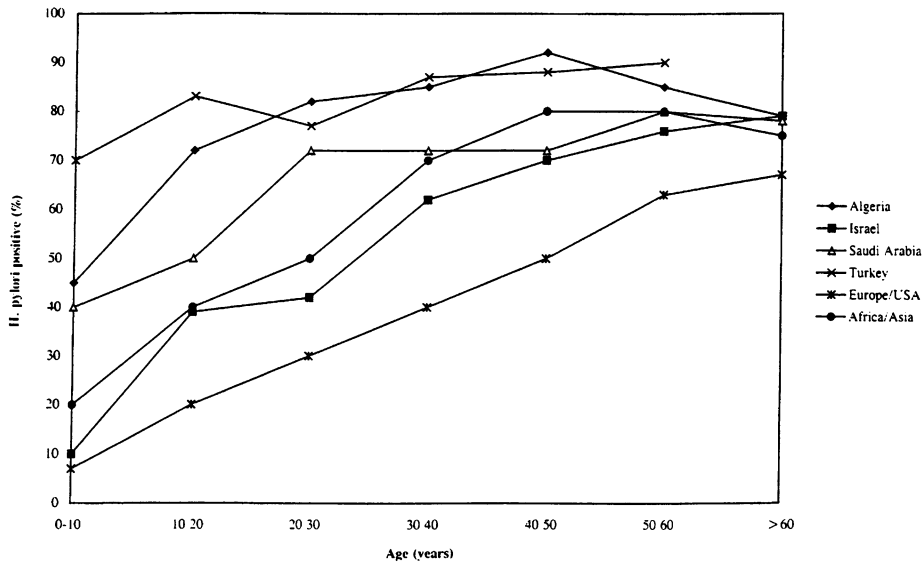
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**Figure 1.** *H. pylori* in the Middle East.

Prevalence studies based on asymptomatic randomized studies have been reported in four countries of the Middle East [17-20]. Two studies have been reported from Israel [17, 18]. In 1993, a study in 311 asymptomatic individuals from urban Jerusalem was reported. An enzyme immunoassay was used to determine the presence of anti-*H. pylori* Ig in individuals aged between 20 to 70 years undergoing periodic health examinations and randomly selected for each decade of age. A sero-prevalence of 65 percent in the overall population was found; it increased with age from 43 percent in those aged between 20 to 30 years to more than 80 percent in those aged 60 years and older. *H. pylori* infection was not associated with gender, marital status or with the country of origin.

In a second study from Israel [18], reported in 1995, 377 asymptomatic randomly chosen members from a number of rural communal settlements (kibbutzim) with an age range from six to 90 were tested using an ELISA technique. *H. pylori* infection was present in 72 percent of this population. There was an increase among age groups from 10 percent in those aged 0 to 10; to 39 percent in the teenagers; 60 percent in people in their 30s; 70 percent in the 40 to 60 age group and 85 percent in the over 60-year-olds. There was no significant difference between males and females or number of years of living on the kibbutz. A significant association was found between *H. pylori* infection and country of origin. The highest prevalence was in people of Mediterranean and Asian origin, 89 percent, and those of East European origin, 80 percent. People born in Israel had a 66 percent prevalence of infection, and those of North and West European origin had the lowest prevalence of 57 percent. This association between *H. pylori* infection and country of origin remained true even after adjusting for age. The relatively high prevalence rate in the kibbutz population might be explained by the communal lifestyle, reminiscent of a very large family.



**Figure 2.** *H. pylori* prevalence.

In Figure 2 and Table 1, the prevalence of *H. pylori* infection in the four Middle Eastern countries in which studies have been reported—Algeria, Israel, Saudi Arabia and Turkey—is shown and compared with a number of epidemiological studies from Europe and the USA, which for the purposes of this paper have been combined, as have some studies from Sub-Saharan Africa and Asia. The two Israeli studies have been combined in this graph.

In 1990, a study from Saudi Arabia using an ELISA IgG antibodies in 577 persons, ranging from five to 90 years old, randomly selected from a primary health care facility, showed a rapid rise in the prevalence of *H. pylori* infection from 40 percent in those aged five to 10 years to over 70 percent in those aged 20 years and 80 percent in those over 50 years.

In 1989, in a seroepidemiology study in four countries, Megraud and Belgouri [1] examined 277 sera from Algerian blood donors and children attending a primary care clinic. Children in the first decade of life had a 45 percent prevalence of infection. This rose

**Table 1.** Epidemiological studies: *H. pylori* prevalence.

Country	Percent <i>H. pylori</i> positive according to age						
	0-10	10-20	20-30	30-40	40-50	50-60	>60
Algeria	45	72	82	85	92	85	79
Israel	10	39	42	62	70	76	79
Saudi Arabia	40	50	72	72	72	80	78
Turkey	70	83	77	87	88	90	—
Europe/USA	7	20	30	40	50	63	67
Africa/Asia	20	40	50	70	80	80	75

**Table 2. *H. pylori* prevalence in various gastrointestinal conditions.**

Country	Number	Gastritis	PU	NUD	Total
Israel	192	78	86	61	77
Jordan	182	71	84	64	68
UAE*	437	87	95	78	90
Saudi Arabia	201	76	89	89	73
Oman	111	—	92	—	—
Iran	953	—	—	—	86
Egypt	140	93	91	78	—
Yemen	100	—	—	—	92
Turkey	71	90	90	75	91
Europe	—	77	89	64	60
USA	—	86	90	54	68
Africa	—	87	89	75	85

\*United Arab Emirates

steadily during adult life to reach 92 percent in the fifth decade of life and dropped slightly to 85 percent in those over 65 years old.

In a Turkish study [20] of 538 subjects serologically tested, a prevalence of 81 percent for all age groups was reported. A tremendously high prevalence of 70 percent was shown in children up to the age of 10, 83 percent in the 10 to 20 age range, rising to 90 percent in those over 50.

Numerous investigators have studied the prevalence of *H. pylori* infection in patients with peptic ulcer disease, gastritis and duodenitis and non-ulcer dyspepsia [12, 13, 21]. In Table 2, the results of such studies in nine Middle Eastern countries are shown [22-26].

No significant difference in the prevalence of *H. pylori* infection is to be seen in the figures for gastritis and for peptic ulcer disease in Israel, Jordan [22], the United Arab Emirates [25], Saudi Arabia [25], Egypt and Turkey, as compared to the figures quoted in numerous studies from Europe, the U.S. or Sub-Saharan Africa [22].

However, as might be expected, the prevalence of *H. pylori* infection in patients with non-ulcer dyspepsia is higher than that for Europe and the U.S. [21] reflecting the higher prevalence in most countries of the Middle East.

In a study from Israel, the relevance of CagA positive *H. pylori* infection on the clinical course of gastroduodenal pathology was reported [27]. This showed that 24 percent of 104 consecutive *H. pylori* infected children tested by an immunoblot technique were positive for IgG anti-CagA antibodies. This group of CagA positive patients had a higher prevalence of duodenal ulcers (38 percent vs. seven percent) and more active chronic gastritis (82 percent vs. 32 percent).

In another study from Israel, Moshkowitz and his colleagues [28], studying the seasonal variations of duodenal ulcer disease and its complications, which have been repeatedly demonstrated, concluded that the frequency of *H. pylori* infection in dyspeptic patients in Israel is significantly increased in the winter months and decreases in the summer, which is identical to the seasonal variation found in duodenal ulcer disease. The method they used, which may be questionable, was to compare the monthly variations of the number of <sup>14</sup>C urea breath tests performed in dyspeptic patients referred for investigation, with that of an unrelated <sup>14</sup>C-cholyl-glycine breath test. No seasonal variation was to be found in the latter, but a significant decrease in the percentage of patients with *H. pylori* infection was found in the summer compared to the winter months.

The same group [29] have also reported on a therapeutic study of omeprazole, clarithromycin and tinidazole in *H. pylori* infection. They showed that this one-week, low-dose triple therapy was highly effective as an initial therapy in eradicating *H. pylori* infection in 95.7 percent of cases, as assessed by a  $^{14}\text{C}$ -urea breath test, four weeks after treatment. However, in patients who had previously failed to eradicate *H. pylori* with a bismuth, amoxycillin, metronidazole triple therapy regimen, there was only a 54 percent eradication rate. This, they do not believe, was due to nitromidazole resistance as 93 percent of *H. pylori* isolates were sensitive in an *in vitro* study. The exact reason for this discrepancy in eradication results in the two groups thus remains unclear. In a study from Turkey, Ozden et al. [30] concluded that the recurrence rate of *H. pylori* infection during the first year after eradication was higher (33.3 percent) in populations infected at an early age.

## DISCUSSION

Although the data presented on the prevalence of *H. pylori* in the Middle East are not completely satisfactory, it does suggest again the critical role of socio-economic development in determining *H. pylori* prevalence, particularly in childhood. In general, the prevalence in the Middle East seems to place this region in the group with a high level of *H. pylori* infection persisting and slowly increasing with age.

Israel would seem to be an exception with a low prevalence rate in childhood, but with a rapid rise in the second to fourth decade of life, placing it between the developed and developing countries. This may be explained by the fact that Israel is a country with a high rate of immigration, and, as shown in one study (18), a significant association was found between the prevalence of *H. pylori* and the country of origin, the rate being highest in those of Mediterranean and Asian origin (89 percent) as compared to those of North American/Western European origin (57 percent).

The higher prevalence rate in the kibbutz population as opposed to the urban population in Israel might be explained by the communal lifestyle of people living in close proximity, and perhaps infecting one another.

The finding of a significantly increased *H. pylori* infection rate in the winter months in Israel, as compared to the summer months, may be explained by the increased crowding indoors in the rainy cold winter, providing an increased opportunity for disease transmission.

The prevalence of *H. pylori* infection in gastroduodenal pathologies in the Middle East is as can be expected, similar to those of other countries of the world, again conforming to the close association of these conditions with *H. pylori* infection. Bacterial eradication rates are also probably of a similar rate to other countries, but rates of recurrence may be higher.

The *Helicobacter pylori* scenario in the Middle East, the cradle of Western civilization, does not differ very much from other developing areas of the world. As this area develops and the socio-economic situation improves or deteriorates because of uncontrolled population growth, it will be of interest to see its effect on the prevalence of *H. pylori* infection and the incidence of upper gastrointestinal pathologies in this area.

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