

## PREVALENCE OF *HELICOBACTER PYLORI* IN OBESE PATIENT

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**Abstract:** Background: *Helicobacter pylori* is a widely recognized pathogen that exhibits a high prevalence among the global population. The infection caused by *H. pylori* poses significant health risks due to its association with various gastrointestinal disorders, including gastric ulcers, duodenal ulcers, chronic gastritis, and gastric carcinoma. The regulation of gastric hormones, such as ghrelin and leptin, plays a crucial role in energy homeostasis. Ghrelin, secreted by P/D1 cells in the stomach during periods of hunger, stimulates appetite and promotes food consumption. Conversely, leptin, released by P cells in the stomach and adipocytes after food intake, reduces appetite and fosters a sense of fullness. Individuals infected with *H. pylori* tend to have lower plasma levels of both ghrelin and leptin compared to those who are not infected. Consequently, the reduced serum leptin levels can delay the sensation of satiety during meals, leading to increased energy intake and a potential development of obesity. Aim: Our study has been proposed and structured to achieve the below objectives: Prevalence of *H. pylori* associated with overweight. Presence or absence of some clinical signs among patient. Prevalence of infection among age group. Methods: Blood seem were collected from 30 person during the period from February to April 2023 and both gender were participate in this study with age ranging from 20-50 years old. Blood tests were used to measure the antibodies against *H. pylori*. The sample were collected and small amount of it applied in to well In the test line area, anti-human IgG is rendered immobile. Following its addition to the device's specimen well, the specimen reacts with the test's *H. pylori* antigen-coated particles. This mixture interacts with the immobilized anti-human IgG and migrates chromatographically over the course of the test. A colored line will show up in the test line region, signifying a positive result, if the samples contain *H. pylori* antibodies. A colored line indicating a negative result won't show up in this area if the specimen is devoid of *H. pylori* antibodies. To act as a methodical. Result: Our study shows that Middle age group were the highest percentage among other age group (35 %). In another hand the overweight patient suffering from *H. pylori* infection constitutes about 36.7 %.

**Keywords:** *Helicobacter Pylori*, Obese Patient, Infection.

### INTRODUCTION

*Helicobacter pylori* is a widely recognized pathogen that exhibits a high prevalence among the global population. Infection with *H. pylori* poses potential health risks due to its association with various gastrointestinal disorders, including gastric & duodenal ulcers, chronic gastritis, and gastric carcinoma. Consequently, clinical guidelines

advocate for antibiotic therapy to eliminate this pathogen, which typically results in the desired therapeutic outcomes (Ji, J., & Yang, 2020). Obesity, on the other hand, represents a significant public health issue, with approximately two billion adults classified as overweight and 609 million as obese, accounting for nearly 39% of the adult

population worldwide. The prevalence of obesity has risen markedly from 1975 to 2016 (Chooi *et al.*, 2019). Key contributors to this increase include excessive caloric consumption, reduced physical activity, and a predominantly industrialized lifestyle (Damcott & Shuldiner, 2003).

An elevated Body Mass Index (BMI) is a critical risk factor for numerous health conditions, such as diabetes, cardiovascular diseases, musculoskeletal disorders, and various cancers, including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon cancer (Kyrou *et al.*, 2018), as well as childhood asthma (Abreo *et al.*, 2018). Overall, obesity significantly contributes to morbidity and healthcare costs (Hruby & Hu, 2015).

Additionally, it is linked to diabetes mellitus and hypertension (Chu *et al.*, 2010). Recent studies have proposed a possible connection between *Helicobacter pylori* and overweight;

however, the findings have been inconsistent, leaving the relationship ambiguous (Kamareheri & Mohammadi, 2022). The link between *H. pylori* infection and overweight remains a subject of debate. An ecological study indicated an inverse relationship between the prevalence of *H. pylori* and the rates of overweight and obesity in developed nations (Lender *et al.*, 2014). Conversely, the eradication of *H. pylori* has been associated with notable weight gain

### Prevalence of *H. Pylori* Infection in Middle-East Countries

*Pylori* infection in Middle East region are reported to be high and warrant attention (Khedmat *et al.*, 2013). Epidemiological data from some of these countries shows the incidence of *H. pylori* infection in children to be 40-70 %, which increase with age 85-90 %. The following figure (1) shows the prevalence of *H.pylori* infection in various Middle East countries (Khedmat *et al.*, 2013, Hussein, 2010).

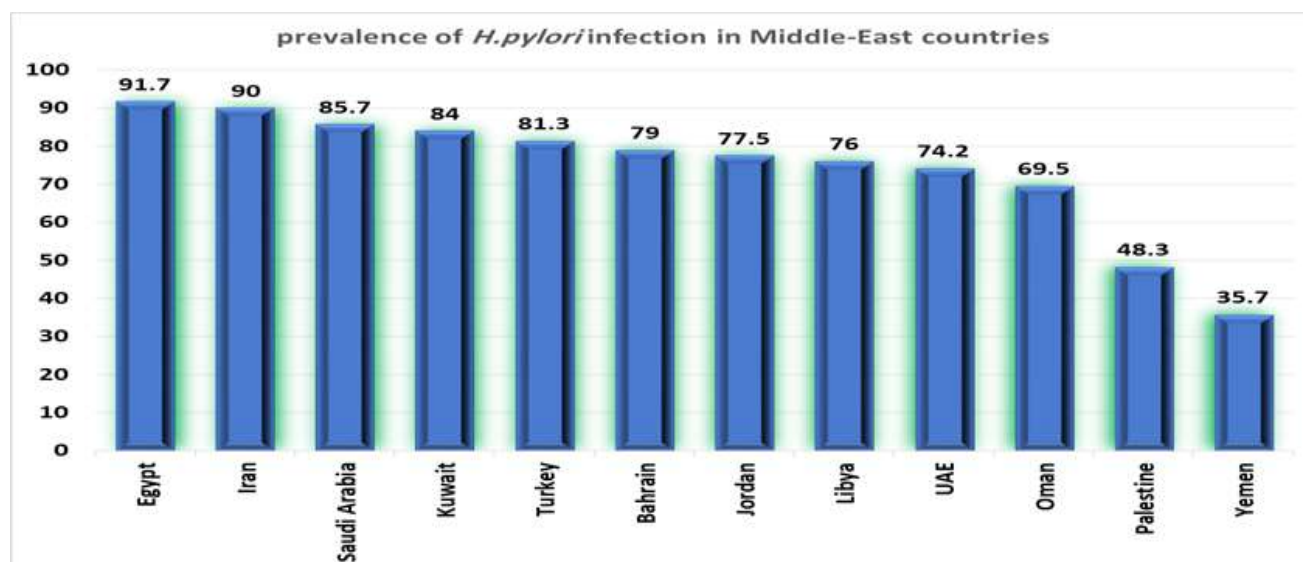


Figure 1: Shows the prevalence of *H.pylori* in Middle East countries

Approximately eighty five percent of individuals infected with *H. pylori* remain asymptomatic or experience mild gastritis, there exists a 15 % risk of developing peptic ulcer disease (PUD) over the course of a persistence infection, with about one percent potentially progressing to gastric cancer. *Helicobacter pylori* have ability to trigger both the innate and adaptive immune responses of the host, which may lead to many conditions such as atrophic gastritis, dysplasia, metaplasia, and ultimately gastric cancer. Most updated research indicates that eradicating *H. pylori* in individuals with

absence symptoms of all ages can significantly limiting the incidence of gastric cancer. The pathogenicity of *H. pylori* is influenced by various virulence factors and genes, including the cytotoxin-associated gene A protein (CagA), vacuolating cytotoxin protein (VacA), duodenal ulcer promoting gene (DupA), and urease, all of which play crucial roles in damaging host tissues and contributing to gastrointestinal diseases (Qureshi *et al.*, 2019). Moreover, *H. pylori* urease and its byproducts can directly harm host tissues. Ammonium ions may compromise the integrity of the connections

between gastric epithelial cells, while carbon dioxide enhances the bacteria's resistance to damage from nitric oxide metabolites and peroxynitrite generated by phagocytic cells (Debowski *et al.*, 2017). Urease also promotes inflammation and angiogenesis in vivo, independent of its catalytic function, and directly stimulates human neutrophils to generate reactive oxygen species, further contributing to host injury (Souza *et al.*, 2019).

### Gastric Cancer Due to *H. Pylori*

The association of *H. pylori* infection with benign and malignant diseases of the gastrointestinal tract is well-recognized. In fact, *H. pylori* has been deemed as the strongest risk factor for gastric cancer. In the Middle Eastern countries, gastric adenocarcinoma occurring as a consequence of chronic *H. pylori* infection, is a significant cause disability adjusted life-years, and imposes a high health-care burden. In an Iranian study<sup>o</sup>, 89.2 % of adults with gastric cancer aged 40 years or above had evidence of *H. pylori*.

Similarly, the microbiological/serological tests in 79 % and 71.6 % patients with gastric carcinoma in Jordan and Saudi Arabia, respectively were positive for the organism. "Libyan studies" have further suggested, *pylori* infection to be the most probable causal factor of gastric cancer, particularly in the Eastern territory. In patients with histologically proven gastric adenocarcinoma and malignant lymphoma, residing in Eastern Libya, the total frequency of *H. pylori* infection was 63.2 % (Khedmat *et al.*, 2013).

### Obesity Relation with *H. Pylori*

Obesity is characterized by an excessive accumulation of fat that can negatively affect health. According to estimates from the World Health Organization, more than 600 million individuals worldwide were classified as obese in 2014. The global prevalence of obesity more than doubled from 1980 to 2014.

There is a notable association between obesity and infectious diseases, with certain infections potentially leading to increased fat accumulation. Notable examples include human adenovirus 36, H1N1/influenza virus, HIV, and *Helicobacter pylori* (Dhurandhar *et al.*, 2015). Research indicates a higher

prevalence of *H. pylori* among the general population, and additional studies have found elevated *H. pylori* rates in obese individuals (Carabotti *et al.*, 2014). A systematic review conducted by Dhurandhar *et al.* (2015) revealed that weight gain or increased biomarkers related to weight gain often followed the eradication of *H. pylori*, with many cross-sectional studies indicating a higher prevalence of *H. pylori* infection in obese individuals or those with metabolic dysfunction linked to the infection. 3. Materials and methods

### Patients

The sample were collected from patients with different age group in Al-musayab Technical institute and al Mahawil hospital (Babil governarate).

### Sample

Blood seem were collected from 30 person during the period from February to April 2024 and both gender were participate in this study with age ranging from 20-50 years old as shown in Table 1 (Philip *et al.*, 2009).

### Detection of *H. Pylori*

Blood tests were used to measure the antibodies of *H pylori*. Antibodies are proteins made by the body's immune system when it detects harmful substances such as bacteria. The samples were collected and small amount of it applied in to well The test line area of the test has anti-human IgG immobilized. After the sample is placed in the wells of the kit, it reacts with the particles coated with *H. pylori* antigens in the test.

This mixture migrates chromatographically along the length of the test and interacts with the immobilized anti-human IgG. If the sample contains *H. pylori* antibodies, a colored line will appear in the test line area, indicating a positive result. If the sample does not contain *H. pylori* antibodies, no colored line will appear in this area, indicating a negative result.

### Detection of Body Fat Percentage

Body mass index (BMI) is determined by measuring weight (mass) and height. Weight is divided by height squared and is expressed in units of kg/m<sup>2</sup>, which is derived from mass in kilograms (kg) and height in metres (m).

## RESULT AND DISCUSSION

- The highest percentage of those infected was Young Adult, because they are the most mobile group and love to eat street food and fast food contaminated with bacteria.
- The second highest percentage of infected people were middle-aged people, because their health begins to decline and they are vulnerable to infection with bacteria.
- The lowest percentage was for older people because their percentage in the population is small in Iraq and the Middle East and they receive special health care.

**Table 1: Distribution of patients with H. Pylori Based on gender and weight**

Age	Gender		No. of male and female	%
	Male	Female		
Young (13-29)	5	5	10	33.3 %
Middle age (30-59)	11	5	16	53.3 %
Old adult (60-90)	2	2	13	43.4 %
Total No.	18	12	30	100%
Total percentage	60%	40%	100%	

The above Table 1 shows that the highest percentage of *H. pylori* infection were present in middle age group (53.3%), then old adult age group (43.4), followed by young patient (33.3). This result was agree with (Namyalo et al., 2021) which found that the total prevalence obtained from the study was

about forty percent which is less than seventy percent foreseeable in countries of African, The high percentage of *H. pylori* infection in middle age group may be due to eating too much fast food, as well as having unhealthy meals in restaurants or other places.

**Table 2: Distribution of H. pylori infection according to BMI percentage**

S.No.	Type of BMI	Percentage %
1.	Normal	16.7
2.	Over weight	36.7
3.	Obese class 1	33.3
4.	Obese class 2	3.3
5.	Healthy weight	6.7
6.	Under weight	3.3

The result in above table shows that the main patients in our study were overweight (36.7 %), followed by obese class I (33.3 %). Our result was agree with (Kamarehei & Mohammadi, 2022) The prevalence of *H. pylori* infection in obese adults is 57.2 %, while the prevalence of *H. pylori* infection in non-obese adults is 27 %. Weight gain relation with *H. pylori* infection may be caused by gastrointestinal hormones (ghrelin and leptin), which are involved in metabolic control and energy balance in the stomach and can stimulate food absorption. Although epidemiological studies (Siddiqui et al., 2018) have demonstrated an linked between *H. pylori* infection & obesity, the mechanism of *Helicobacter* infection and obesity has not been clearly defined. *H. pylori* infection affects the parietal cell responsible for gastric acid production. *pylori* infection triggers an

inflammatory process in multiple gastric cell types, especially cells responsible for the production of (Leptin & Ghrelin) and may contributed to leptin and ghrelin production. Leptin reduces intake of food and appetite, in other means, it is a hormone that responsible for energy regulation by reduce hunger feeling. Obese patients have reduced leptin sensitivity (as in diabetic patient type 2 with insulin resistance), which causes them to feel less full despite high energy reserves and elevated level of leptin. Therefore, these type of infection may cause obesity by reducing leptin sensitivity (Blaser & Atherton, 2004). Also, *H. pylori* eradication increases the gastric secretion of ghrelin, which leads to appetite, weight increase, so gerlin promote appetite stimulant lead to weight gain and obesity.

As a conclusion the infected patient suffering from disturbance in these two hormone leading to overweigh, this result was agree with (Pan *et al.*, 2014). Also, our study proposed that H. pylori infection may influenced eradication, obesity control as well as strategy of lifestyle. Due to the dietary habits importance, mostly in development country.

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