

Link of Helicobacter Pylori (H. pylori) to Overweight Patients and Patients with Obesity in two Obesity Centers-Sulaimani Governorate-Kurdistan-Iraq, Prospective Case Study Series

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Abstract:

Background: The prevalence of overweight and obesity worldwide was estimated, claiming that one-third of adult individuals suffering from overweight or obesity; and in some regions, the prevalence of adults' obesity exceeded 50%

Objectives: To find the incidence of Helicobacter pylori infection in overweight patients and patients with obesity, visiting two bariatric centers in Sulaimani governorate.

Patients and methods: A prospective case series study including 60 patients with overweight or obesity was conducted in Sulaimani Teaching Hospital for seven months from October 1st, 2020, to April 30th, 2021.

Results: From a total of (60) patients (6) males, (6) females were overweight, while (18) males, (30) females were obese. Serology for H. pylori done for all the patients was positive in (41/60=68%), while stool was positive just in (22/59=37%).

Conclusion: Seroprevalence of anti-H. Pylori in the patients showed a possible relationship between infection with H. pylori and gaining weight. However, serology tests may be undependable, and gastric mucosal biopsy may be more accurate in testing for H. pylori, especially in bariatric patients before and after the operations.

Key words: BMI, Eradication, H. Pylori, Overweight, Obesity.

Introduction:

The prevalence of overweight and obesity in Sulaimani governorate-Iraqi Kurdistan is high (20.6% and 11.3% respectively), ⁽¹⁾ in comparison to Erbil governorate-Iraqi Kurdistan, the overall prevalence of overweight and obesity was 74.3% (33.4% overweight and 40.9% obese), ^(2, 3) while worldwide, it was estimated that one-third of adult individuals suffering from overweight or obesity; and in some regions, the prevalence of adults' obesity exceeded 50%. ⁽⁴⁾

Obesity is associated with infectious diseases, such that certain infections may trigger an increase in adiposities, such as human adenovirus 36, H1N1/influenza virus, human immunodeficiency virus, and *Helicobacter pylori* (*Helicobacter pylori*). ⁽⁵⁾

Helicobacter pylori are Gram-negative bacteria that colonize gastric mucosal epithelium of humans and some primates; not only leads to various gastro-duodenal diseases such as chronic gastritis, peptic ulcer, mucosa-associated lymphoid tissue lymphoma (MALT), and gastric cancer but also plays a role in cardiometabolic disorders. While conclusive evidence for a causative role of *Helicobacter pylori* infection in human obesity is lacking, the relationship between *Helicobacter pylori* and obesity is still controversial. Reports from different areas and countries were not consistent with each other. ⁽⁶⁾

Near half of the world, population are infected with *Helicobacter pylori* ⁽²⁾, in Sulaimani governorate, serum anti-H. *pylori* antibodies were positive in (62%), H. *pylori* stool antigen (26%), urea breath test (8%) ⁽⁷⁾, while in a study from Erbil governorate states that the prevalence is (55.8%), which is lower than in neighboring countries e.g., Kuwait (81%), Jordan (82%) and Turkey (63%). ⁽⁸⁾

Several epidemiological studies have focused on the correlation between *Helicobacter pylori* colonization and BMI and obesity; some studies have observed weight gain following successful *Helicobacter pylori* eradication although it does not imply that there is an absolute difference in BMI between *Helicobacter pylori*-negative and positive subjects. ⁽⁸⁾ Indeed, several studies did not find any influence of bacterial eradication on body weight. Furthermore, epidemiological studies have failed to show any association between *Helicobacter pylori* infection and BMI; with a meta-analysis of (18) observational studies, available data on *Helicobacter pylori* infection and obesity are still controversial, the need for *Helicobacter pylori* screening and eradication before surgery is still debated. ^(9, 10, 11)

Current work aims to find the incidence of *Helicobacter pylori* infection in overweight patients and obese, visiting two bariatric centers in Sulaimani Governorate.

Patients, materials, and methods:

The work has been reported in line with the STROCSS criteria. ⁽¹²⁾ A prospective case series study including (60) patients with overweight or obesity was conducted in

Sulaimani Teaching Hospital for seven months from October 1st, 2020, to April 30th, 2021.

Each patient was evaluated clinically with weight, height, and BMI, measured before and on each visit after the operation with a digital weight scale. All patients underwent complete clinical evaluation (including serology for H. pylori, mostly stool for H. pylori, and some for a urea breath test or gastric mucosal biopsy). These investigations were done free of charge at the expense of Sulaimani Teaching Hospital.

For the collection of the required information, each patient was interviewed face-to-face by a trainee (from Kurdistan Board for Medical Specialties/Surgery)

An originally designed questionnaire was filled in the English language, translated to the Kurdish language by the interviewer, which was reviewed and accepted by four professors in surgery. The questionnaire was composed of demographic, medical, and biological data. Informed consent was obtained, and each patient signed a consent form. The research was confirmed by the Ethics Committee of the Kurdistan Board for Medical Specialties

All data were collected, organized, and analyzed by Statistical Package for the Social Sciences (SPSS); version 21. *P* = 0.05 was considered statistically significant.

Results:

The male to female ratio was 2/3 (Table 1); the most expected age group for obesity was (40-49) years in males and (30-49) years in females (Table 2).

Table I: Shows gender differences in seeking advice and treatment.

Male	Female
24 (40%)	36 (60%)

The male to female ratio was (2/3)

Table II: Shows age groups in both genders in overweight patients and patients with obesity.

Age	female	male	Total
10-19	2	0	2
20-29	6	2	8
30-39	11	8	19
40-49	11	13	24
50-59	4	0	4
60-69	2	1	3

The most common age group in males were (40-49) years, while in females were (30-49) years.

Table III: Stool test for H. Pylori in both overweight and patient with obesity.

Variables	Total	Positive stool for H. pylori test	Negative stool for H. pylori test	Stool for H. Pylori test not done
Overweight	12	2	10	0
Patients with obesity	48	20	27	1

Stool for H. pylori was positive (2/12=16.66%) in overweight and was positive (20/48=41.66%) in the patients with obesity.

Table IV: Correlation of H. Pylori positive with the source of water supply.

H. pylori tests	Tap water	Well water	Mixed
Serology test positive	22	10	9
Stool test positive	11	4	7
Urea breath test positive	4	1	2
Mucosal biopsy positive	2	0	1

Stool for H. pylori was positive in (11) patients using tap water and in (4) patients using well water.

Table V: Degree of BMI in the patients.

BMI	Number	female	Male
25-29.9	12	6	6
30-34.9	25	13	12
35-39.9	17	12	5
40 >_	6	5	1

From the total of (60) patients, (6) male and (6) female were overweight, while (18) male and (30) female was obese, and the obesity was most common in the first degree (30-

34.9), was (12) male, (13) female, total (25 from 60) was (41.66%), of the total of a minority were within morbid obesity (6/60=10%).

Table VI: Showing Frequency and percentage of different water sources of water in the patients.

Source of drinking water	Number of patients	Positive H. pylori at least by one test	Negative H. pylori by all tests
Tap Water	33(55%)	26	7
Well Water	12(20%)	12	
Both	14(23.33%)	11	3
Other	1(1.66%)	1	

More than half of the patients (33/60=55%) were using and drink tap water, and a quarter of them was using well water (12/60=20%); H. pylori was positive in the group of tap water, well water (26/33= 78%), (12/12=100%) respectively, 14 patients (23%) were using both tap and well water and (11/14=78%) of them have positive H. pylori test.

Table VII. This table show prevalence of family history of obesity and H. pylori

Family History	Father	Mother	Sister	Brother	Negative family history	Positive family history	P value
Obesity	17	25	18	22	9	51	0.013
H.pylori	0	5	9	2	44	16	0.013

Positive family history of overweight and obesity was (51) patients (85%), mostly mother (25/51 = 49.01), and then brother (22/51=43.13%), H. Pylori was positive in (5) mothers (31.25%), and 2 brothers (12.5%), meanwhile H. pylori was negative in (44) patients (73.33%).

Table VIII: This table shows the prevalence of H. pylori infection in overweight patients and patients with obesity according to four different types of tests.

H. Pylori Tests	Positive	Negative	Not Done	P value
Serology	41(68%)	19	0	0.001
Stool	22(37%)	37	1	0.001
Urea Breath Test	7(29%)	17	36	0.001
Mucosal Biopsy	3(30%)	7	50	0.001

Serology for H. pylori done for all the patients was positive in (41/60=68%), while stool was positive just in (22/59=37%), urea breath was done for some of them was positive (7/24= 29%), and biopsy for minority was positive (3/10=30%).

Discussion:

Relation of H. pylori infection and weight changes is over changing, not settled, and controversy is continuous.

The male to female ratio was 2/3 (Table 1). The commonest age group for obesity was (40-49) years in males and (30-49) years in females (Table 2). In a study by Hadi, et al. males were more in number having positive H. pylori results, and the main age group was (29-32) years of age ⁽¹³⁾ while in line with another study from Erbil-Iraqi Kurdistan by Pshtewan, et al., stating that it was more common in females, and in age group (20-31) years. ^(14, 15, 16)

As we had seen in table 3, just (2) patients from (12) overweight patients have positive (16.66%) H. pylori results, while (20) patients from a total of (48) patients with obesity were positive (41.66%) for H. pylori, this is going with the results of Wu M, et al. ⁽¹⁷⁾, and Xu X, et al., ⁽¹⁸⁾ but contradict what Chen, et al. had found. ⁽¹⁹⁾

The possible source of H. pylori infection, speculated to be any ingested material, especially water in the current work, four patients using well water and eleven patients using tap water had positive stool test for H. pylori, (Table 4).

These findings may not reflect the actual gender ratio in overweight and obesity in our locality, but presents the motive for management of the weight problem.

The result indicates that more females are seeking advice and trying to manage their problems and in younger age (30-49) years.

In comparison to male (40-49) years, females (5 patients) continue to ask for management even if they are (50-69) years versus males (one patient) who inquires for management in this age group.

In other words, females seek remedies at an earlier age, in more significant numbers and continue to care about their health and body image up to age of (69) years or more (Table 3), although the (BMI) of the females revealed, number of them were morbid obese (5 female versus one male), (Table 4).

In the eastern pattern of life, human being lives with their parents and siblings, even after 18 years of age, it is infrequent to live alone, but with their families who may be the main reservoir of *H. pylori*.⁽²⁰⁾

Even those married contact their parental family frequently regularly, many times a week, sharing drinks and foods⁽²¹⁾ which forced the authors to search for the frequency of obesity and *H. pylori*-positive tests in all the parents and siblings see (Table 6).

Fifty-one patients of the total (60) patients have a positive family history of a weight problem, only nine patients (15%) have parents and siblings with average age, while the rest of the (51) patients (85%) have a family history of overweight and obesity, obese mothers are (25= 49.01%) and brothers (22=43.13%).

While *H. pylori* tests were negative in 44 patients (73.33%), it was positive in 5 mothers and two brothers who were suffering from weight excess (Table 7).

Infection of *H. pylori* can be diagnosed by invasive procedures such as culture, histology, and rapid urease test and by noninvasive tests include urea breath test, serology, urinary antibody test, and stool antigen test. The detection of serum anti-*H. Pylori* antibodies serology is the main diagnostic technique used in Sulaimani hospitals⁽¹⁷⁾ which is undependable, and the presence of asymptomatic *h pylori*, in overweight and obesity may cause cancer^(22, 23, 24, 25) which may be misinterpreted as a result of diet or drugs, intragastric balloon in overweight and bariatric operations in patients with obesity. In order to decrease bias in the etiology of gastric cancer in those patients, it is advisable to depend on gastric biopsy either by endoscopy before surgery or asking for *H. pylori* examination with the sample of sleeved stomach postoperatively when sending for histopathological examination.⁽¹⁸⁾

In the current work, *H. pylori* test in the total (60) patients who were included, about two-thirds had positive (41=68%) serology for *H. pylori*. Nevertheless, only (22) patients (37%) were positive for stool detection of *H. pylori*, and only seven patients were positive in the urea splitting test. The results may mean Serology for the detection of *H. pylori* is inaccurate and has given false-positive results. When compared to stool and urea splitting Test (Table 8), and shown significant (P-value)

This difference in the results indicates that serology maybe not accurate & dependable for the diagnosis of *H. pylori* infection. At the same time, if it is possible gastric mucosa biopsy is the best available stable base for examination of *H. pylori* before and after

bariatric surgeries, as over 80% of the cases are asymptomatic, and it may play an essential role in the natural stomach ecology. ^(19, 20)

The most outstanding limitation of the present study was the small size of its sample chosen from only two centers, limiting the generalizability of the findings. In this regard, future studies are recommended to study larger samples.

Conclusion:

According to seroprevalence of anti-*H. pylori* antibodies, there is a possible relation between infection with *H. pylori* and gaining weight. However, serology tests may be undependable; gastric mucosal biopsy may be more accurate in testing for *H. pylori*, especially in bariatric patients before and after the operations.

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