Association of *Helicobacter Pylori* and Irritable Bowel Syndrome

by

Ghufran Abdulelah Al-Talakani

M.B.Ch.B.

Academic supervisor

Professor

Dr. Ali Talib Al-Damarchi

Department of Internal Medicine

College of Medicine/ University of Al-Qadisiyah

A case-control study conducted from the 1st of January to 30th of June, 2018, in Al-Diwaniya city, Iraq.

Correspondence should be addressed to

ghufranabdulelah@gmail.com

Abstract

Background

IBS is one of the most common health issues experienced in family practices, with a prevalence varying from (1% to 20%) globally. Different estimates allocate the yearly financial value of IBS in physician visits, medications in USA at 20 billion dollars. Innovative therapies in IBS are urgently required. The aims of treatment are to relieve symptom and improve quality of life. Treating IBS can be predominantly difficult because symptoms frequently are recurring and resistant to treatment. A positive patient-physician communication is linked with less return visits for IBS and is a key factor in the management of these patients

As there is a scarcity of valuable treatments for IBS, the disease has a significant impact on patients' quality of life and socioeconomic status.

As a bacteria specialized in inhabiting the gastric mucosa, *H. pylori* is notorious as the chief cause of variable intestinal and extra-intestinal conditions. Yet, the link between *H. pylori* infection with IBS is still debatable. This has provoked us to execute a case-control study searching into the association between *H. pylori* status and IBS.

Objective

This study is designed to explore the association of H. pylori and the development of IBS, along with revealing if there is any association between this infection and the development IBS.

Methods

A descriptive case-control study of 135 individuals was conducted. We select (60) patients from inpatient and outpatient clinic (38 females, 22 males) and were diagnosed as IBS with respect to Rome 4 criteria.

Another 75 (42 males, 33 females) seem to be healthy individuals without significant past medical history were assigned as control group.

The two groups were subjected to stool antigen for H. pylori and the results were compared between the two clusters.

Results

There was no statistically significant association between HP infection and IBS (p= 0.7). The analysis explored higher prevalence of IBS in younger age group (p= 0.6) with overall female preponderance (p=0.02) and more common in married than single patients (p=0.4, p=0.8; respectively). The most common presentation was diarrhea predominance subtype (p= 0.56).

Conclusion

There is no significant association between H. pylori infection and occurrence of IBS in the general population.

1. Introduction

IBS is considered to be the most dominant health issues experienced in the family practice, with a global prevalence of (1% - 20%). IBS is identified by abdominal campy pain, retching, bloating, and uneasy evacuation of the bowel without a recognized physical or organic defect. It classically emerges in early adulthood, even though it could develop in adolescents and in individuals around the age of 45 years; those older than 50 years with symptoms of IBS must have a complete assessment regarding any underlying conditions[1]. Young females are 2–3 times more prone to IBS than males.

As there is a scarcity of valuable treatments for IBS, the disease has significant impact on patients' quality of life[2,3] and socioeconomic status[4].

The pursuit for better care for IBS patients is hindered by a shortage of insight into the fundamental pathogenic mechanisms. Prior studies proposed that abnormal brain-gut interactions, change of intestinal flora, chronic mucosal inflammation, and psychological disorders can be implicated in the pathophysiology of IBS. These processes incite altered bowel motility and rise mucosal permeability and visceral hypersensitivity, which then precipitate the clinical features on IBS[5-8].

As a bacteria specialized colonizing on the gastric mucosa, *H. pylori* is well-known as the chief cause of chronic gastritis, peptic ulceration, gastric carcinoma, and gastric MALT lymphoma[9-11]. Moreover, *H. pylori* may have a part in extra-gastric syndromes, perhaps by prompting systemic inflammatory responses [12,13]. However, the link between *H. pylori* infection with lower GI disorders chiefly IBS remains unsettled[14-16].

2. Subjects and Methods:

1) Study design and setting

A descriptive case-control study was carried out in Al-Diwaniya Teaching Hospital and outpatient clinic in Al-Diwaniya city from January to June 2018.

2) Patients and sample size

We select (60) patients from inpatient and outpatient clinic (38 females, 22 males) and were diagnosed as IBS with respect to Rome 4 criteria and by complete history and physical examination and investigated with various set of tests. Another 75 (42 males, 33 females) seem to be healthy individuals without significant past medical history were assigned as control group.

3) Inclusion Criteria

All patients were selected according to Rome 4 criteria (published in 2016) which are the latest criteria for the diagnosis of IBS. These include: Recurring abdominal pain at least 1 day/week in the last 3 months, accompanied by two or more of the following criteria:

- Related to defecation
- Associated with a change in frequency of stool
- Associated with a change in form of stool.

Criteria achieved for the last 3 months with symptom onset at least 6 months before diagnosis[17].

4) Exclusion criteria

These involve any alarming symptoms, which make the diagnosis of IBS unlikely:

- Rectal bleeding
- Anemia
- Nocturnal symptoms

- Weight loss
- Recent antibiotic use
- Onset after 50 years of age
- Abnormal abdominal examination (organomegally, lump)
- Family history of colorectal cancer or ovarian cancer.
- Family history of inflammatory bowel disease, or celiac disease.

5) Methodology

For the purpose of the study, initially we select (67) individuals from inpatient and outpatient clinic who had suggestive symptoms. Both groups underwent full history and physical examination and were investigated regarding the risk of organic diseases in form of complete blood count, ESR, blood glucose level, liver function test, general stool examination, celiac serology, thyroid function test, abdominal ultrasonography. Two patients turned to have another organic illness, namely infectious diarrhea and the other diagnosed with thyroid disease. Therefore were excluded from the study. Additional 3 patients were also omitted as they appeared to have some red flag symptoms like rectal bleeding, antibiotic related diarrhea, and abdominal mass by abdominal ultrasonography. Further 2 patients who had Typical Rome 4 criteria refuse to participate in the study. Consequently we assemble 60 patients with characteristic Rome 4 criteria for IBS and willing to continue in the study, 38 were females and 22 were males.

In the light of the purpose of our study, both groups were investigated with H. pylori stool antigen test.

6) Statistical analysis

Information was collected and included in a data-based system and analyzed by statistical package of social sciences (SPSS, Inc., Chicago, IL, USA) version 20. Parametric data were expressed as mean ± standard deviation (SD) such as age. It was evaluated statistically by means of student t-test while non-parametric data were expressed as proportions like male and female were analyzed using chi square. Significance was set at the $P \leq 0.05$ levels in all analyses.

3. Results

A case-control study enrolled 135 person; 60 patients with IBS as a case group and 75 healthy individuals as a control group (Figure 1). The mean age of cases is 33.5±2.5 and the mean age of control group is 34.8±3.1, sixty five percent of patients in age group of 20-39 years and sixty percent of control is in same age group, while age group 40-59 is 26% in case group and 28% in control as in shown (Table 1):

Figure 1: Case–control distribution.

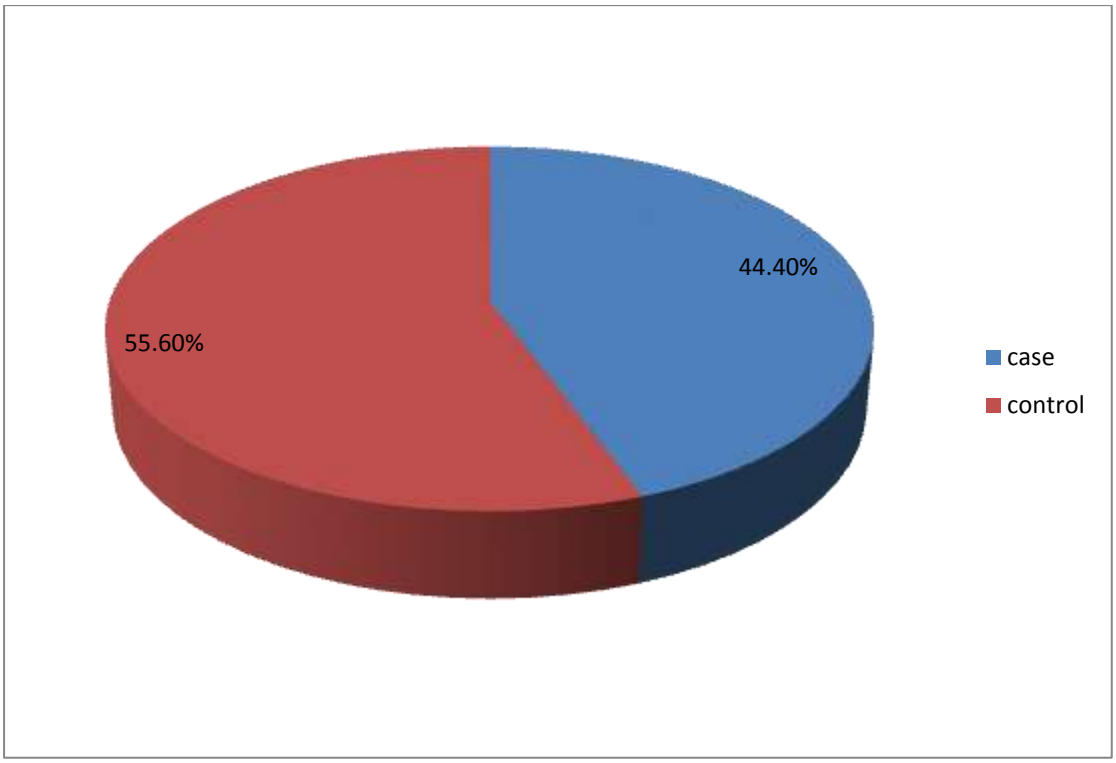

Table 1: Age distribution in both groups.

Age group	case	Control	p-value
< 20 year	4(6.6%)	6(8%)	**0.91**
20-39 year	39(65%)	45(60%)	**0.6**
40-59 year	16(26%)	21(28%)	**0.3**
≥ 60year	1(1.4%)	3(4%)	**0.5**
Total	60	75	

Table 2 shows gender distribution, 63% of cases were female and 37% male, while in control 44% were female and 56% were male with odd ratio equal to 0.4 and 95% confidence interval (CI) 0.2-0.91.

Table 2: Gender distribution in both groups.

Gender	case	Control	p-value
female	38(63%)	33(44%)	**0.02**
Male	22(37%)	42(56%)	
Total	60	75	

Out 60 cases, there were 35% positive H pylori and 65% negative, and in control there were 30.6% positive H. pylori, and 69.3% were negative for H. pylori, , with odd ratio 0.7 and 95% and confidence interval 0.3-1.5 as in (Table 3).

Table 3: The prevalence of H. pylori in case group and control group.

H pylori	case	Control	p-value
Positive	21 (35%) Female(15)	23 (30.6%) Female (11)	**0.7**
Negative	39 (65%) Female (23)	52 (69.3%) Female (22)	
Total	**60** Female (38)	**75** Female (33)	

In case group, there were 36.65% had IBS-D, 25% had IBS-C, 21.6% had IBS-A, 16.8% had IBS-U. Regarding H. pylori positive patients, there were 38% of them had IBS-D, 23.8% had IBS-C, 19.1% were positive for both IBS-A and IBS-U as (Table 4) shows.

Table 4: show predominant symptoms in cases.

Type of IBS	H.pylori positive	H.pylori negative	Total	p-value
Diarrhea predominant	8 (38%)	14(35.8%)	22(36.6%)	**0.56**
Constipation predominant	5 (23.8%)	10(25.6%)	15(25%)	**0.4**
Alternating predominant	4 (19.1%)	9(23%)	13(21.6%)	**0.1**
Unclassified predominant	4 (19.1%)	6(15.6%)	10(16.8%)	**0.21**
Total	21	39	60	

With reference to prevalence gender, age, and residency in IBS patients, as (Table 5) shows, there were 39.5% of female had IBS-D, 29% had IBS-C, 18.5% had IBS-A, and 13% had IBS-U. As for age-group of 20-39 years, there were 33.3% had IBS-D, 30.7% had IBS-C, 20.5% had IBS-A, and 15.5% had IBS-U. Whereas the residency, there were 34% of urban had IBS-D and 31.7% of them had IBS-C, 19.5% had IBS-A, and 14.8% had IBS-U.

Table 5: Predominant clinical varieties of IBS for female gender, age-group and urban residency.

Type of IBS	Gender (female)	Age (20-39)	Residency (urban)
IBS-D	(39.5%) 15	13(33.3%)	14(34%)
IBS-C	11 (29%)	12(30.7%)	13(31.7%)
IBS-A	7 (18.5%)	8(20.5%)	8(19.5%)
IBS-U	5 (13%)	6(15.5%)	6(14.8%)
Total	38	39	41
p-value	**0.9**	**0.8**	**0.3**

3. Discussion

IBS is a significant health challenge to society, and the creation of a innovative treatment for this syndrome is unfulfilled by the lack of understanding of its etiology and pathogenesis. In the existing study we attempted to discover the probable link between H. pylori and IBS[18].

In reference to (Table 1) that exhibits 135 individuals divided in 4 age groups comprising of (60 patients with IBS, with median age of 33.5 +/- 2.5) demonstrates that IBS is more prevalent in age group of 20-39 (with a percentage of 65%) than other age groups in the case cluster. This result corresponds to a study in Lebanon 2017 which described 67% of cases of the same age group[19]. Other study labeled 40% in same age group in China[20].

These studies can be explained along with what our results have shown that the reasonably high occurrence of IBS in young people may be owing to psychological and emotional influences, such as stress related to studies and exams, finding jobs, monetary status, or marriage.

Our result reveal IBS more occurred in female patients 63% than males 37% as in (Table 2), these numbers are comparable to those of a study by ford[21] in USA which stated that 62% were female and 38% were male of study sample ,also correspond to other studies worldwide [22,23]. An alternative research by Farzaneh 2013[23] of the IBS patients, 62.1% were females, 37.9% were males.

On the contrary, various studies accomplished in Asia did not expose gender variance prevalence, other resources has identified a predominance of females [24,25].

The basis for this debatable gender dissimilarity is indefinite. Pan et al [26] ascribed this gender variance to female hormones on account of the falling occurrence of IBS in women post-menopause. Chang & Heitkemper[27] designated that gender-related differences in GIT transit time, visceral hyper-excitability, neurological pain processing, neuro-endocrine, autonomic nervous system, and anxiety responses can clarify the majority of IBS in women.

As by (Table 3), our result demonstrated 35% of cases were positive H. pylori and in control group there were 30.6% had positive H. pylori, these finding are not statistically significant (p value 0.7). a study by

Antonio Barrios showed that among 38 patients enrolled, 50% were *H. pylori*-positive and 50% were negative[28] and detected that the total infection rate of *H. pylori* in IBS sufferers in the study has no significant association from that of the of control.

In relation to type of IBS, as per (Table 4) it has revealed 36.6% (IBS-D), 25% (IBS-C), 21.6% IBS-A, 16.8 (IBS-U).

In positive H pylori cases, there were 38% (IBS-D), 23.8% (IBS-C), and IBS-A and IBS-U is 19.1% for each subdivision. These result consistent with result by Dorn SD[29] which reported 30% (IBS-D), 25% (IBS-C), 14.3% alternating from positive H pylori cases.

When debate with further studies we established that in study by Farzaneh[23], IBS-C around 52% with interchanging symptoms of mixed subtype (IBS-M) and diarrhea (IBS-D) was the maximum prevalent type of IBS. Of all IBS cases which had a referral to gastroenterology clinic in Iran, Roshandel, *et al*, stated that IBS-A is the utmost prevalent (60%) and IBS-C and IBS-D to be 29.1% and 10.9%, respectively[30].

The higher prevalence of IBS-D in our research may be clarified by the fact that the majority of patients were referred from primary health centers to our gastrointestinal outpatient clinic. General practitioner may be more assured in managing of IBS-C, since IBS-D may request more complex investigation and procedures. Lin et al[31] established an alternate diagnosis for 21% of patients referred from primary health care as IBS-D, whereas no different diagnosis was made for IBS-C [32].

As a final point, in our result we can realize that (IBS-D) with regards to female gender comprises of 39.5% cases, 33.3% of age-group 20-39 years, and 34% of urban residency (Table 5). These statistics parallel to outcome by ford 2014, which labeled those with IBS-D, were younger, more probable to be female [21,33]. On the other hand, a study by Feng Xiong[43] 2016, established that patients between 41-50 years of age had the maximum occurrence of IBS-D with female predominance.

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