

Helicobacter Pylori Infection as Coincidence in Gallbladder Disease: Is It Worth for Routine Testing

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To cite this article:

Fatima Al Harmoodi, Meera Al Matrooshi, Mohammed Al Suwaidi, Katharina Kessler. Helicobacter Pylori Infection as Coincidence in Gallbladder Disease: Is It Worth for Routine Testing. *International Journal of Gastroenterology*. Vol. 4, No. 2, 2020, pp. 50-53.

doi: 10.11648/j.ijg.20200402.15

Received: June 24, 2020; Accepted: July 25, 2020; Published: August 10, 2020

Abstract: Background: Abdominal pain is one of the most common presented symptoms to the medical services, and some of them are assumed to be due to cholecystolithiasis. Helicobacter Pylori (*H. pylori*) gastritis can cause equal symptoms as cholecystolithiasis. A lot of researches in the field are trying to clarify the misdirection, as this will change the management for cholecystolithiasis patients. Methods: In this retrospective study from October 2018 till July 2019 at Al Ain Hospital, United Arab Emirates, a coincidence of having *H. pylori* infection in the presence of gallstones was investigated, and if a routine testing for *H. pylori* was done. Results: Total number of 159 cases from different nationalities, majority were United Arab Emirates locals were assembled and investigated. Although the majority of the studied group were not investigated for *H. pylori*, and around 30 patients were investigated, Results showed a 36% rate of positivity of *H. pylori* among the investigated people, which is similar to the other researches in this field. Majority of the *H. pylori* testing were done via antigen stool test analysis, as its inexpensive method, reliable and appropriate. Conclusion: Data showed that still Helicobacter testing is not routinely done, however a high infection rate similar like other studies detected. More awareness and further studies recommended.

Keywords: Helicobacter Pylori, Gallbladder Disease, Cholecystolithiasis, Gallstone, Al Ain Hospital

1. Introduction

Gallbladder disease is one of the most common diagnosis, faced in surgical field, with the main symptom being developing upper abdominal pain. Helicobacter Pylori (*H. pylori*) infection, which is due to a gram negative bacteria, shows similar clinical features as symptomatic cholecystolithiasis, and in some cases might be misdiagnosed to be symptomatic cholecystolithiasis or the opposite. In the Middle East, Helicobacter pylori infection among the population, regardless of the nationality, is high. However patients are not routinely tested for *H. pylori*. Studies investigating the presence of *H. pylori* in the bile or the tissue of the gallbladder postoperatively are showing evidence of the bacteria. Other studies have checked culture sensitivity from the bile collected, but there was no evidence of growth. Some studies have investigated the presence of the *H. pylori* antibodies in the bile [1]. Due to the burden of this disease, more studies were done to investigate the nature of the effect

of this bacteria on the gallbladder mucosa, some even are studying the possibility of *H. pylori* in causing gallbladder cancers from repetitive cholecystitis, causing dysplasia, metaplasia and carcinoma [2]. Hence, more studies should be done to determine more relation of *H. pylori* infection in the biliary system. This retrospective study from a Level 2 hospital from United Arab Emirates was conducted to evaluate the coincidence of *H. pylori* disease in patients whom considered as symptomatic cholecystolithiasis.

2. Method

A retrospective study was conducted from October 2018 till July 2019 in Al Ain Hospital in United Arab Emirates. Patients undergoing cholecystectomy and were older than 18 years old, were evaluated, if they got a routine testing for *H. pylori* preoperatively or not. Furthermore the persistence of abdominal pain post cholecystectomy was investigated. All data were collected from a computerized hospital system

record. Post-operative visits to the Emergency Department and the clinics were followed to determine the improvement of the symptoms.

3. Results

Total number of 159 cases were assembled between October 2018 and July 2019, all cases were investigated by the general surgery department in the clinic pre operatively. Average age of the group selected was 40.9 with average Body mean index (BMI) of 30.42 kg/m². A total of 105 females and 54 males were in the study (table 1). The study was conducted from different nationalities and ethnicities, with middle Eastern were the bulk in the study with around 94 cases and UAE nationals been the majority in number with around 63 patients with 44 of them were females (figure 1). 12 of the studied group had bariatric surgery before the cholecystectomy. All of the patients had a pre op workup with images and labs according to the national guidelines. All of the patients had Ultrasound (US) prior to surgery except 4, 1 of them no records of any US images was found, and 1 had a Computerized Tomography (CT) scan. 33 of these patients had cholecystitis, while the rest had cholecystolithiasis. Only 51 of the patients in the study had an abnormal liver function test before the surgery, and of them 41 patients had Magnetic resonance cholangiopancreatography (MRCP), and only 28 required endoscopic retrograde cholangiopancreatography (ERCP) before the surgery.

Among these patients 129 were not investigated for H. pylori as 27 of them were already on regular Proton Pump inhibitors (PPI). 30 patients were investigated in the preoperative workup. 11 had a positive H. pylori test and 19 had a negative H. pylori test. 15 Females had a negative test, while 6 females had a positive test. On the other hand, 5 males were positive for H. pylori and 4 had negative test. This shows around 81% rate of noncompliance for routine testing as shown in figure 2, and a rate of 36% positivity for H. pylori. 7 patients were tested with urea breath test, 2 of them had both urea breath test and stool test, 17 patients had stool test done for them and 5 patients had endoscopy and gastric biopsy testing for them, making the majority of patients had stool antigen detection test as the commonest method to detect H. pylori as shown in figure 3. Majority of the patient didn't attend for a medical care after the surgery, few of them had improved their symptoms of pain after the surgery and 19 of them still complaining of abdominal pain despite removing the gallbladder, with 3 of them who had initially a negative test for H. pylori, and 4 of them who had a positive test for H. pylori, which was mainly treated with quadruple therapy.

Table 1. Patient characteristics.

Parameter		%
Average age (in years)	40.9	
Gender		
Males	54	33.96%
Females	105	65.04%
Average BMI	30.4 kg/m ²	
Ethnicity		

Parameter		%
Middle Eastern	94	59.11%
Asian	37	23.27%
African	28	17.61%
Images		
US	154	96.8%
CT	1	0.62%
MRCP	41	25.7%
ERCP	28	17.6%

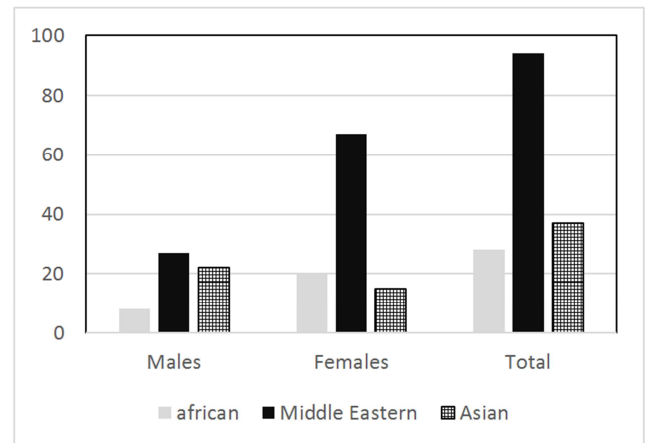


Figure 1. The different ethnicities and ratio between females and males in the studied group.

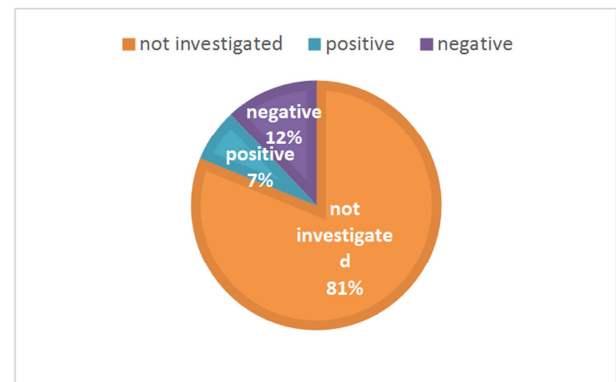


Figure 2. The percentage of preoperative H. pylori detection test.

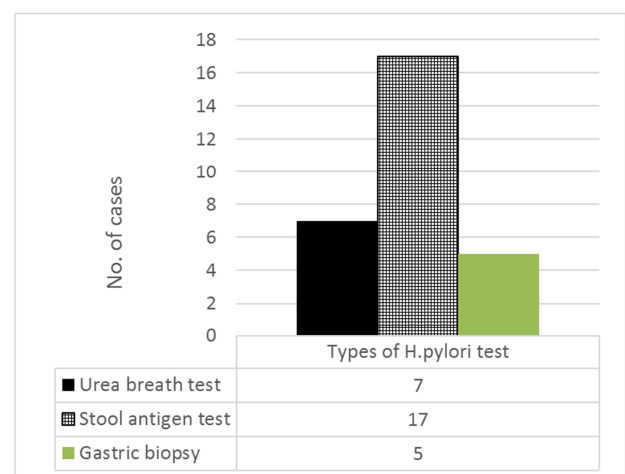


Figure 3. Method of H. pylori testing.

4. Discussion

Gallbladder disease is one of the most common problems in the surgical field with an estimate of 36% presence of cholecystolithiasis in present literature [3]. Females are more at risk to get gallbladder diseases than males. Other factors that can increase the chance of developing cholecystolithiasis, may include, but not limited, to obesity, older age, rapid weight reduction method and fertility. Some studies described the presence of *H. pylori* in the biliary system is also one the causes of developing gallstones and gallbladder polyps [4], while others showed no relation between the presence of *H. pylori* in the stomach or in the biliary system to cause any gallstone [5].

In this study, the number of the females that had gallstones were higher than the males, and the average BMI for the patients were obese.

Majority of cholecystolithiasis cases will be asymptomatic, in fact around 80% will not develop any complication of having cholecystolithiasis [6]. Abdominal pain is the most common presented symptoms of cholecystolithiasis, despite being vague and might not be related to a developing or present gallbladder stone.

Since the symptoms of cholecystolithiasis is mainly related to its complications of developing cholecystitis, pancreatitis or other problems, numerous researches were conducted to identify other causes for the abdominal pain rather than the possible asymptomatic cholecystolithiasis. Hence, many thought of *H. pylori* to be the most common cause of the abdominal pain since its prevalence in the population is very high and has equal symptoms.

In a recent study in the United Arab Emirates (UAE), it was found that around 41% of the studied group of 350 people with different ethnicity were positive for *H. pylori* [7]. In another recent analysis that was published last year, it was found that the prevalence of positivity of *H. pylori* among adults between the ages of 16-30 years was found to be higher [8]. Hence the conception of investigating the coincidence of developing gallstones is crucial to diagnose and treat the patients appropriately. In our study 6.9% of the total group were positive, still within the fact, that the vast majority of patients are not even tested.

Diagnosing patients with positive *H. pylori* test as a coincidental finding of gallstones might save the patient from undergoing an unnecessary surgery with its risk for complications.

H. pylori testing can be done with several methods including urea breath test, histology and culture from gastric biopsy and stool antigen testing [9]. As it's shown in our study, majority of the patients have been tested with stool antigen detection method, which is a noninvasive and reliable method, easy to perform and with low denial rates from insurance companies.

In one of the studies the researchers investigated the presence of *H. pylori* in the gallbladder mucosa and gastric mucosa after cholecystectomy for symptomatic cholecystolithiasis, and found a coincident of having 37% of

the cases with positive *H. pylori* [3]. Another study from Kingdom of Saudi Arabia, found that the presence of *H. pylori* in the bile might indicate a risk for formation of gallstone, a Polymerase Chain reaction (PCR) method was used to determine the presence of *H. pylori* DNA in the bile and was affective in about 34.7%. [10]

In our study we aimed on detecting *H. pylori* infection pre operatively with simple methods. Our result despite having a low group of people, who had routine preoperative testing, is showing comparable result to other studies, which is around 36% of overall infection rate.

By some means are we treating asymptomatic cholecystolithiasis as symptomatic in certain cases? Since the prevalence of *H. pylori* is high, and there is explained relation between it and cholecystolithiasis, more investigation should be done to detect *H. pylori* and eradicate it, and evaluate the patients for persisting symptoms. Medical treatment will be more effective and less cost than cholecystectomy for asymptomatic cholecystolithiasis. Additional studies promoted that eradicating *H. pylori* infection, might prevent gallstone formation, although this needs further investigation and work [11].

Eradicating *H. pylori* infection should be based on the population and resistance of the bacteria [12]. In a research that was done in UAE and published in the international journal of pharmacy in 2014, Triple therapy was used to treat different residence nationalities, and it was found that Sudanese residents are having higher failure rate to triple therapy, while Filipino residents are having almost 100% response for the triple therapy, indicating the importance of tailoring the management of *H. pylori* to every patient [13].

After completion of the eradication therapy, a reassessment of the patient is needed, and a repetition of the test after 4 weeks is required to determine the response to the treatment [14].

The limitation of the study included but not limited to the lack of *H. pylori* testing before booking for laparoscopic cholecystectomy and lack of follow up of the patients in the clinic.

Since the limited follow up of patient is familiar in the healthcare service and it's noticeable with its possible effect on the patients and their management, a lot of studies are presented to show the importance of regular follow up and the result of it on the patients' management. A review was conducted in a tertiary hospital in UAE for the *H. pylori* positive patients and their follow up rate for the first and second follow up in the clinic, concluded to have only 64% of the investigated patients to attend to the clinic for their first time follow up after diagnosis, which decreased to 29% for the second visit follow up after diagnosis, making around 10% of the studied individuals to complete all the follow up needed [15].

Due to the countries ambiance and healthcare organization preoperative other than mandatory testing and postoperative follow up, data is difficult to secure. More awareness to adjust routine measures needs to be introduced.

5. Conclusion

In summary, multiple studies showed more people with *Helicobacter Pylori* positive detection than known. Diagnosing them and treating them might help the society in many different ways. Most of the researches about the relation between gallbladder stones and *Helicobacter Pylori* are showing a coincidental findings. So treating the *H. pylori* infection first before making any conclusion, might improve the patient's symptoms with medical treatment rather than invasive surgery. Nevertheless, due to scarcity of routine *H. pylori* testing prior to the surgery, further awareness and formation of extended workup plans is needed, to make an appropriate conclusion and re investigation should be attempted after.

Acknowledgements

We express our deep gratitude to Al Ain Hospital for the support.

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