

## Medical Communication

# Is *Helicobacter pylori* Association Suspicious of Gastric Cancer? A Descriptive Retrospective Study

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## ABSTRACT

Stomach cancer is the second leading cause of cancer-related mortality worldwide. The present study aimed to answer whether *Helicobacter pylori* associated is suspicious of gastric cancer as a cause for gastric biopsy over-diagnosis. In this descriptive retrospective study, we retrieved data referring to gastric biopsies for one year back from the Department of Pathology at King Salman Hospital, Hai'l, Northern Saudi Arabia. The study included data referring to gastric biopsies patients diagnosed during the period from October 2019 to November 2020. The most identified histopathological finding was chronic inflammation 179/192(93.2%) included 84/88(95.5%) males and 95/104(91.3%) females. Acute inflammation was identified in 6/192(3%) patients, included 2/88(2.3%) males and 4/104(3.8%) females. Benign lesions were diagnosed in 3/192(1.6%) cases, 1/88(1.13%) male and 2/104(1.92%) females. Carcinoma of the stomach was diagnosed in 3/192(1.6%) patients, included 1/88(1.13%) male and 2/104(1.92%) females. There is an overuse of gastric endoscopic diagnosis. *H. pylori* infection is prevalent in Northern Saudi Arabia. It frequently makes confusion for gastric carcinoma. The incidence of gastric cancer and other benign stomach tumors is very low in Northern Saudi Arabia. Strict guidelines for gastric endoscopy is deemed necessary in Northern Saudi Arabia.

**KEY WORDS:** STOMACH CANCER, GASTRIC CANCER, H. PYLORI, SAUDI ARABIA, GASTRIC BIOPSY, ENDOSCOPY.

## INTRODUCTION

Gastric carcinoma is the second leading cause of cancer-related mortality worldwide. However, the epidemiology has been changed in the past few years due to increased awareness toward gastric cancer risk

factors (Sitarz et al., 2018). Notably, gastric cancer's geographical epidemiology had changed in recent years with progressive eradication of *Helicobacter pylori* (*H. pylori*) and improved hygiene (Fock, 2014; Marghalani et al., 2020). Many risk factors have been implicated in stomach cancer's etiology, such as *H. pylori*, tobacco smoking, alcohol consumption, obesity/overweight, and eating red meat, etc. (Poorolajal et al., 2020a; Poorolajal et al., 2020b). However, *H. pylori* infection

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represents the primary cause of gastric cancer (Holleczek et al., 2020), usually associated with chronic gastritis (Chen et al., 2020).

The available literature from Saudi Arabia reported an incidence of 2.7% of gastric cancer in 2013 (Abuderman, 2019); however, later report has shown that gastric cancer increased 3-fold (Althubiti and Nour Eldein, 2018). A study from Saudi Arabia has reported a prevalence of 58.1% for *H. pylori* infection, which is relatively higher than the global reports (Akeel et al., 2018). Several laboratory tests exist to diagnose *H. pylori* infection (Nakamura, 2001) other than the invasive endoscopic biopsy. However, overdiagnosis of gastric tumors may be encountered with *H. pylori* infection. Therefore, the present study aimed to answer whether *H. Pylori*-associated suspicious of gastric cancer a cause for gastric biopsy over-diagnosis.

### MATERIAL AND METHODS

In this descriptive retrospective study, we retrieved data referring to gastric biopsies for one year back from the Department of Pathology at King Salman Hospital, Hai', Northern Saudi Arabia. The study included data referring to gastric biopsies patients who were diagnosed during the period from October 2019 to November 2020. The diagnosis of gastric tissue biopsies was confirmed by conventional histopathology. The re-evaluation of the histopathological diagnosis of the tissue samples was completed to verify the prior diagnosis and categorize the lesion's classification into benign and malignant types or other varieties.

**Statistical analysis:** Data were analyzed using computer software; Statistical Package for Social Sciences (SPSS version 16; SPSS Inc, Chicago, IL). Chi square test was employed to statistical significance ( $P < 0.05$  was considered significant).

**Ethical consent:** The protocol of this study was established agreeing with the 2013 Declaration of Helsinki. Additionally, the study's protocol was approved by the ethics committee of the College of Medicine, University of Hail, Saudi Arabia. Ethical Committee approval number: EC00069.

### RESULTS AND DISCUSSION

This study investigated 192 patients denoted for gastric biopsy, 88(45.8%) were males, and 104(54.2%) were females. Their ages ranged between 14 to 84 years, with a mean age of 38 years. Most patients were aged < 25 years & 25-34 years, constituting 45/192(23.4%) each, followed by 35-44 years and 45-54 years representing 39/192(20.3%), and 32/192(17.7%), respectively. Most males were at age range < 25 years 21/88(23.9%); hence, most females were at the age group 25-34 years 25/104(24%), as indicated in Table 1, Fig 1.

The most identified histopathological finding was chronic inflammation 179/192(93.2%) included 84/88(95.5%)

males and 95/104(91.3%) females. Acute inflammation was identified in 6/192(3%) patients, included 2/88(2.3%) males and 4/104(3.8%) females. Benign lesions were diagnosed in 3/192(1.6%) cases, 1/88(1.13%) male and 2/104(1.92%) females. Carcinoma of the stomach was diagnosed in 3/192(1.6%) patients, included 1/88(1.13%) male and 2/104(1.92%). Females, as indicated in Table 2, Fig 2, as shown in Image 1.

Table 1. Distribution of the study subjects by sex and age

Age	Males	Females	Total
<25 years	21	24	45
25-34	20	25	45
35-44	20	19	39
45-54	11	21	32
55-64	11	12	23
65+	5	3	8
Total	88	104	192

Figure 1: Description of the study subjects by age and sex

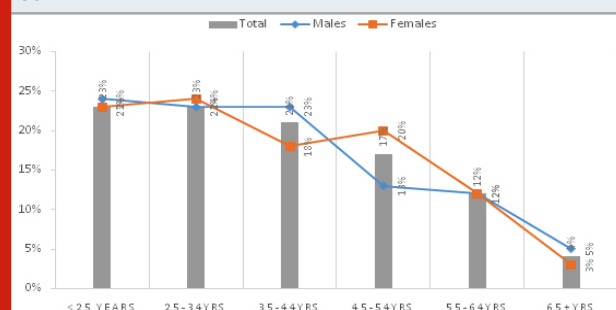


Table 2. Distribution of the study subjects by sex and histopathological diagnosis

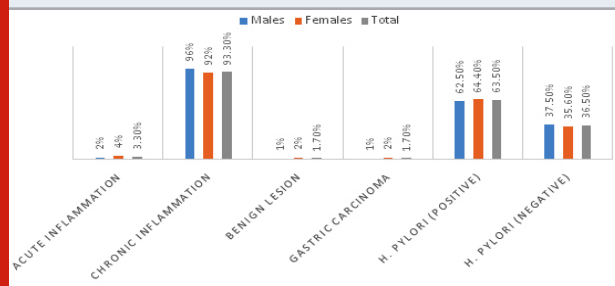
Diagnosis	Males	Females	Total
Histopathology			
Acute inflammation	2	4	6
Chronic inflammation	84	95	179
Benign lesion	1	2	3
Gastric Carcinoma	1	2	1
Total	88	104	192
<i>H. pylori</i>			
Positive	55	67	122
Negative	33	37	70
Total	88	104	192

*H. pylori* infection was diagnosed in 122/192(63.5%), included 55/88(62.5%) males and 67/104(64.4%) females. The relative risk (RR) of association between *H. pylori* infection and females sex, and the 95% confidence interval (95%CI); RR (9%CI) =1.0308 (0.8307 to 1.2791),  $P = 0.7832$ , z statistics = 0.275, shown in Table 2, Fig 2.

**Microphotographic 1. Gastric Carcinoma (H&E) x400**

Table 3, Fig 3, summarized the distribution of the study subjects by sex and histopathological diagnosis. Chronic inflammation was more frequent among the younger population <44 years. Acute inflammation was common between 35 to 54 years. Benign lesions were observed between 35 years and 64 years. Gastric carcinoma was distributed in younger age, middle age, and older age.

Figure 2: The study subjects by sex and histopathological diagnosis



Positive *H. pylori* were more frequent in the younger age ranges. However, when calculating the percentages within each age group, variable proportions can be observed, as shown in Fig 3 and Image2.

**Microphotographic 1. Gastric Carcinoma (H&E) x100**

Image 1

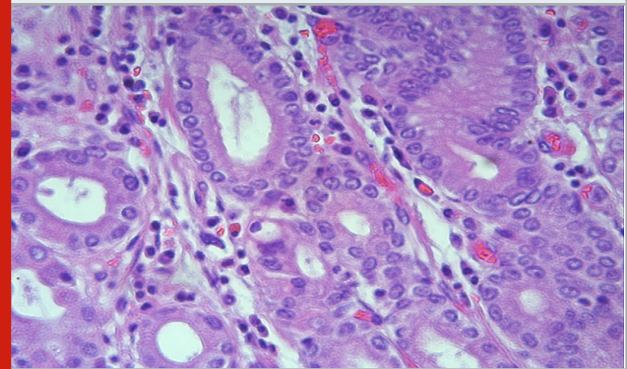


Table 3. Distribution of the study subjects by age and histopathological diagnosis

Diagnosis	<25years	25-34	35-44	45-54	55-64	65+	Total
<b>Histopathology</b>							
Acute inflammation	2	0	2	2	0	0	6
Chronic inflammation	43	44	36	28	21	7	181
Benign lesions	0	0	1	1	1	0	3
Gastric Carcinoma	0	1	0	1	0	1	2
<b>Total</b>	<b>45</b>	<b>45</b>	<b>39</b>	<b>32</b>	<b>23</b>	<b>8</b>	<b>192</b>
<b>H. Pylori</b>							
Positive	27	28	23	24	15	5	122
Negative	18	17	16	8	8	3	70
<b>Total</b>	<b>45</b>	<b>45</b>	<b>39</b>	<b>32</b>	<b>23</b>	<b>8</b>	<b>192</b>

As cancer is growing to be a concern for many people, and with a greasing level of awareness programs in addition to widespread of cancer early detection tests, the number of over-diagnosis is increasing with the application of invasive diagnostic methods. With the increased prevalence of *H. pylori* infection, several patients with the infection are subjected to gastric endoscopic biopsies. In the present study, the incidence of gastric cancer was 1.5%, and the incidence of benign conditions was 1.5%. The remaining 97% biopsies were performed for inflammatory diseases, some of which were associated with *H. pylori* infection. This incidence of gastric cancer was much lower than the previously reported incidence of 2.7% (Abuderman, 2019).

The incidence of *H. pylori* infection in the current study was 63.5%. This incidence may predict a high prevalence rate in the country. *H. pylori* infection is the primary cause of chronic active gastritis, peptic ulcer, and gastric cancer. *H. pylori* infect around 50% of the world population, making it the most widespread infection worldwide (Akeel et al., 2018). Studies from

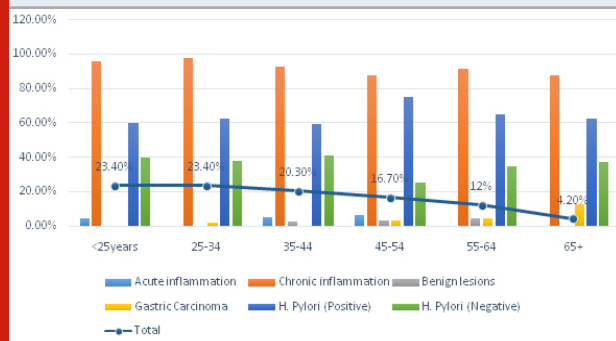
Saudi Arabia report high prevalence rates of *H. pylori* infection. A study from Saudi Arabia reported *H. pylori* infection 67-87% of the children diagnosed with peptic ulcer (El Mouzan and Abdullah, 2004).

Another study from Saudi Arabia investigated school children with chronic recurrent abdominal pain; 73% were detected as positive for *H. pylori* infection, including 62.9% and 82.1% positive infection in an intermediate and secondary school in that order (Telmesani, 2020). Another study from Saudi Arabia has found a relatively lower prevalence of *H. pylori* infection, 49.8% in the investigation included 303 children (Hasosah, 2019). In a random analysis of 3551 healthy children, seropositive for *H. pylori* infection was detected in 40% (Al-Hussaini et al., 2019).

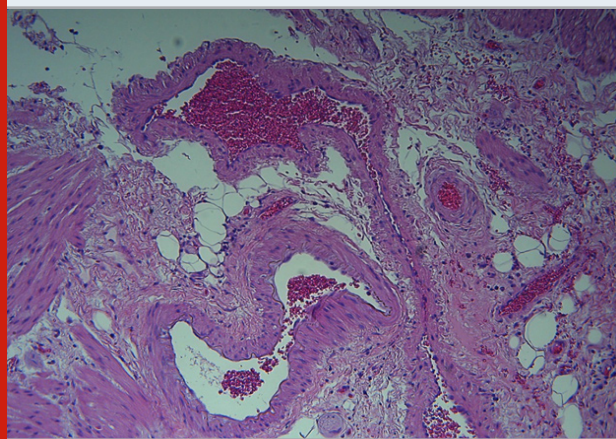
*pylori* infection and other gastric problems were more apparent among females. With the lack of evidence showing the close association between *H. pylori* infection and female gender, the relationship between female sex and increased risk of gastric cancer has been documented

(Choi and Kim, 2016). The association between gastric conditions mentioned in the current study did not show any significant indications, and similarly, the connection with *H. pylori* infection. Although the present study has some limitations, including its retrospective setting, it provides valuable guidance for physicians and health managers for suitable guidelines for more accurate management of patients selected for gastric endoscopy.

**Figure 3: The proportions of the study subjects by age and histopathological diagnosis within the entire age group**



**Image 2**



## CONCLUSION

There is an overuse of gastric endoscopic diagnosis. *H. pylori* infection is prevalent in Northern Saudi Arabia and frequently creates confusion for gastric carcinoma. The incidence of gastric cancer and other benign stomach tumors is very low in Northern Saudi Arabia. Implementing strict guidelines for gastric endoscopy is deemed necessary in Northern Saudi Arabia.

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