

Helicobacter Pylori and Sociodemographic Characteristics Distribution

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www.jrasb.com || Vol. 3 No. 1 (2024): February Issue

Received: 23-01-2024

Revised: 01-02-2024

Accepted: 13-02-2024

ABSTRACT

Introduction and Aim: *Helicobacter pylori* is a gram-negative bacterium that affects up to half of the world's population, particularly in poorer nations. It is the leading cause of chronic gastritis, ulcers, gastric lymphoma, and gastric cancer, with more frequent cases in children and adolescents. Transmission can occur through fecal-oral, gastro-oral, oral-oral, or sexual means. The infection is caused by *H. pylori*'s urease activity, invasion of host gastric epithelial cells, and adherence to host cell receptors. Early treatment can enhance gastric protection. **Materials and Methods:** Between November 2022 and July 2023, 103 samples were collected from patients at Mihrabani Surgical Hospital in Erbil City to identify *Helicobacter pylori* infection. Blood samples and stool samples were used to test for antibodies. **Results:** The study found a relatively equal gender representation in the patient and control groups, with 48.48% of men in the patient group and 48.64% in the control group. However, there are significant differences in age distribution, with G3 of age (<35) having the highest prevalence of *H.pylori* (48.48%). Additionally, 62.12% of patients are rural residents, while 97.29% of the control group are urban residents. Finally, 56.07% of patients are married, indicating a significant difference. **Conclusion:** The study found equal gender representation in patient and control groups but significant age differences, rural residency, and marital status, with G3 under 35 having the highest *H.pylori* prevalence.

Keywords- *Helicobacter pylori*, Gender, age, Residence, Marital Status.

I. INTRODUCTION

Helicobacter pylori (*H. pylori*) is a spiral-shaped gram-negative bacterium that infects up to half of the global population, with a higher prevalence in poorer countries (Graham et al., 2014). *H. pylori* is the primary cause of chronic or atrophic gastritis, gastric ulcer, gastric lymphoma, and stomach cancer (Iannone et al., 2018); nevertheless, these diseases are more common in children and adolescents than in adults. *H. pylori* infection typically originates in childhood and persists if left untreated (Jones et al., 2017). *H. pylori* can be transmitted fecal-oral, gastro-oral, oral-oral, or sexually (Zamani et al., 2017). Low socioeconomic status is a significant risk factor for higher infection rates (Elshair et al., 2022). The four fundamental aspects of *H. pylori* infection cause clinical problems such as gastritis and ulcers. To begin, *H. pylori*'s urease activity is critical for life in the stomach's acidic conditions. Second, *H. pylori* bacteria use flagella to infiltrate host gastric epithelial cells.

Successful colonisation and long-term infection occur when bacterial adherence binds to host cell receptors. Early treatment of *H. pylori* infection may improve GC protection since younger age at *H. pylori* eradication was significantly connected to a decreased risk of GC in patients with and without a familial history of GC (Jung et al., 2023).

II. MATERIALS AND METHODS

2.1 Patients

Between November 2022 and July 2023, 103 samples were collected from patients of both sexes and ages admitted to the gastrointestinal tract (GIT) department of the Mihrabani Surgical Hospital in Erbil City.

2.2 *Helicobacter pylori* sample collection

• Blood sample

103 blood samples were collected from patients with probable *Helicobacter pylori* infection. Shandong

Kanghua developed a quick test for recognizing *Helicobacter pylori* antibodies using immunochromatography.

• **Stool sample**

In order to determine the *Helicobacter pylori* antigen utilizing an immunochromatography (ICA) antigen screening test developed in China by Shandong Kanghua, 103 patients submitted stool samples.

III. RESULTS

The data presented in Table (1) indicates that the patient and control groups are gendered similarly, with 48.48% of the patients being men and 48.64% being women in the control group. The infection prevalence is higher among females (51.52%) than males (48.48%). Moreover, the p-value of 0.987268 indicates that the difference between the two categories is not statistically significant. Conversely, notable disparities can be observed in the age distribution of the patients as

compared to the control group. The patient cohort comprises 19.69% of the 15-24 age population, while the control cohort comprises 48.64% of the same age range. A p-value of 0.001247 signifies the presence of statistical significance. The age discrepancy underscores the importance of age as a plausible variable that could influence our results. The findings indicate that G3 individuals under 35 have the highest prevalence of *H.pylori* (48.48%). Furthermore, a significant discrepancy in place of habitation can be observed, with 62.12% of patients residing in rural areas, whereas a mere 2.70% of controls possess the same attribute. However, it is essential to highlight that 97.29 per cent of the control group consists of urban residents, which results in an exceptionally small p-value of less than 0.00001. Finally, a significant disparity in marital status exists between the group of patients and the group serving as the control. Most patients (56.07%) are married, while the control group (81.09%) is married. The statistical significance of this discrepancy is supported by a p-value of 0.010617.

Table 1: Sociodemographic distribution of characteristics among patients and control.

		Patients		Control		P value
		No.	%	No.	%	
Gender	Males	32	48.48%	18	48.64%	0.987268
	Females	34	51.52%	19	51.36%	
Age	15-24 (G1)	13	19.69%	18	48.64%	**0.001247
	25-34 (G2)	21	31.84%	13	35.13%	
	>35 (G3)	32	48.48%	6	16.23%	
Residence	Rural	41	62.12%	1	2.70%	< **0.00001
	Urban	25	37.88%	36	97.29%	
Marital Status	Single	29	43.93%	7	18.51%	**0.010617
	Married	37	56.07%	30	81.09%	

Several studies have reported inconsistent data regarding the prevalence of *Helicobacter pylori* infection in relation to gender-based disparities. In a study conducted by (Hong *et al.*, 2019) in China, it was observed that the prevalence of *H. pylori* infection was greater in females compared to males, and this difference was shown to be statistically significant (P-value of 0.002). These findings imply a potential relationship between gender and *H. pylori* infection. Also, another study conducted by (Almashhadany *et al.*, 2023) in Yemen revealed that the prevalence of *H. pylori* was comparatively lower among males in comparison to females. The observed regional disparities in the incidence of gender-based disparities may be attributed to changes in socioeconomic, nutritional, and cultural determinants. In contrast, (Monno *et al.*, 2019) found no statistically significant association between *H. pylori* infection and gender. Also, they reported that the high prevalence was in the age 31-50 (36.32%). However, no significance observed between prevalence and age. Also

(Breckan *et al.*, 2016) demonstrated that the increased prevalence with age, except for in the age group above 70 years and significant correlation between age and *H.pylori* prevalence exist. Another important factor influencing the prevalence of *Helicobacter pylori* infection is residency. Numerous research findings have continuously shown that rural areas have a higher incidence than urban ones. (Ito *et al.*, 2022) highlighted the impact of geographic settings on *H. pylori* prevalence by reporting a higher prevalence rate in rural areas.

The study by (Bálint *et al.*, 2019), showed a significant difference in *H. pylori* prevalence between rural and urban areas with a P-value of 0.0051 and the demonstrated the high prevalence in rural areas in comparison to the urban. In the context of marital status, In their study, (Wang *et al.*, 2019) observed a notable correlation between marital status and *H. pylori* infection. Specifically, they found that a majority of married persons exhibited a greater frequency of infection, with a rate of 86.3%. This correlation was determined to be statistically

significant, as indicated by a P-value of 0.0243. This discovery implies that the marital status of individuals could potentially influence the transmission or acquisition of *H. pylori*, potentially due to factors such as cohabitation or other social interactions. (Dobo, 2020) conducted a parallel study that reinforced the aforementioned link, demonstrating a statistically significant variation in the prevalence of *H. pylori* depending on one's marital status. The findings of the study indicate that married persons had a significantly higher occurrence of *H. pylori* infection in comparison to unmarried individuals, as evidenced by a P-value of 0.038.

IV. DISCUSSION

The study reveals that the patient and control groups are gendered similarly, with 48.48% of patients being male and 48.64% being female. However, the infection prevalence is higher among females (51.52%). Age distribution is also significant, with 19.69% of patients aged 15-24, while the control group is 48.64%. Place of habitation is also significant, with 62.12% of patients residing in rural areas, while 97.29% of the control group is urban. Marital status is also significant.

V. CONCLUSION

The study shows a gendered distribution of patients and control groups, with females having a higher infection prevalence (51.52%), while the control group is predominantly male and predominantly urban.

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