

ORIGINAL RESEARCH ARTICLE

HELICOBACTER PYLORI INFECTION AMONG DYSPEPTIC PATIENTS IN CHITWAN, NEPAL

Navin Kumar Chaudhary^{1,*}, Sukrat Paudel²

¹Department of Microbiology, Chitwan Medical College Teaching Hospital, Bharatpur, Nepal

²B.Sc MLT Student, Chitwan Medical College Teaching Hospital (CMC-TH), Bharatpur, Nepal

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***Correspondence to:** Navin Kumar Chaudhary,
Department of Microbiology, Chitwan Medical College
Teaching Hospital, Bharatpur, Nepal.
Email: drnavinkumarchaudhary@gmail.com

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ABSTRACT

Background: *Helicobacter pylori* are gram-negative bacillus that colonizes the gastrointestinal mucosa. Dyspepsia is a clinical syndrome including manifestations related to the upper gastrointestinal tract, which may include acute, chronic, or recurrent pain or discomfort. Understanding the prevalence and the factors associated with *H. pylori* seropositivity in dyspeptic persons can provide a guide for health policies. Aim of the research was to study the prevalence and factors associated with *H. pylori* infection among dyspeptic patients in Chitwan, Nepal.

Methods: A descriptive cross-sectional study was conducted in the Department of Microbiology at CMC-TH from July 2019 to June 2021. A non-probability consecutive sampling technique was employed to collect 510 Stool samples from the suspected patients for the detection of *H. pylori* stool antigen (HpSag) following the procedures recommended by the manufacturer. A standard questionnaire on the potential risk factors was also designated and completed. Chi-square test was used to study the association of *H. pylori* colonization with symptoms, life-style findings and socio-economic status. $p < 0.05$ were considered statistically significant.

Results: HpSag was detected in 20.0%. Prevalence was higher (25.0%) among males compared to females (15.56%). Prevalence was higher among middle-aged (21-60 years) people with smoking, alcohol, and tobacco consumption habits. Socioeconomic conditions and family size play an important role in the prevalence. Nausea, sour eructation, bloating, heartburn, and bleaching were the common symptoms among dyspeptic patients.

Conclusions: The burden of *H. pylori* infection in patients with dyspepsia was high. Factors associated with an elevated level of colonization by *H. pylori* leading to dyspepsia are low income, education up to the primary, habits like smoking, alcohol, and tobacco consumption.

INTRODUCTION

Helicobacter pylori are spiral; a flagellated gram-negative pathogen. It colonizes the luminal surface of the human gastric epithelium. It chronically infects more than 50% of the world's population; 80-90% of them are asymptomatic.¹ It is associated with several upper gastrointestinal conditions including chronic gastritis, peptic ulcer, duodenal ulcer, and gastric malignancy like gastric adenocarcinoma, and mucosal-associated lymphoid tissue lymphoma.²⁻⁴ Moreover, both gastric cancer and peptic ulcer cause more than a million deaths per year globally, thus making it an important health issue.⁵ Human infections occur by consumption of *H. pylori* contaminated foods.⁶ Fecal-oral and oral-oral are the predominant route of transmission among humans; thus making *H. pylori* infection contagious.⁷ *Helicobacter pylori* infection is most (>80%) prevalent in developing countries; the seroprevalence of *H. pylori* varies greatly among societies and geographical locations.⁸ The transmission of the infection is influenced by multiple factors like lack of safe drinking water and basic hygiene, poor sanitation, low socioeconomic status, poor diet, overcrowded living conditions, and living in developing countries.^{1,4,7} The

diagnostic tests used for *H. pylori* diagnosis are grouped as either invasive or non-invasive methods. Invasive methods comprise endoscopic evaluation, histology, the rapid urease test (RUT), and bacterial culture. Non-invasive tests include the *H. pylori* stool antigen (HpSag) test, urea breath test (UBT), serological test, and molecular diagnostic test.⁹ Aim of the investigation was to study the prevalence and factors associated with *H. pylori* infection among dyspeptic patients in Chitwan, Nepal.

METHODS

A descriptive cross-sectional study was conducted in the Department of Microbiology at Chitwan Medical College-Teaching Hospital from July 2019 to June 2021. Study Population was symptomatic cases of dyspepsia visiting department of Medicine, Gastroenterology unit of CMC-TH. A non-probability consecutive sampling technique was employed to collect 510 Stool samples from the suspected dyspepsia patients to detect *H. pylori* stool antigen (HpSag) by immuno-chromatographic techniques as recommended by the manufacturer. A standard questionnaire on the potential risk factors was designated and

completed. Inclusion criteria of patients in this study were patients of >10 years of age, both gender, and symptomatic cases of dyspepsia. Patients taking triple therapy for *H. pylori* eradication in past and also patients with age less than 10 years were excluded in this study. A Chi-square test was used to study the association of *H. pylori* colonization with symptoms, lifestyle findings, and socio-economic status. P <0.05 was considered statistically significant. Informed consent was taken from the patient before their inclusion in the research. Ethical approval was taken from Chitwan Medical College - Institutional Review Committee (CMC-IRC); ref: CMC-IRC/076/077-045.

RESULTS

A total of 510 stool samples were collected from the suspected case of dyspepsia; for detection of *H. pylori* stool antigen (HpSAG). Among that 102 (20%) were positive for HpSAG (Fig.1).

Prevalence of *H. pylori* stool antigen

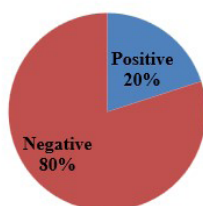


Figure 1: Prevalence of *H. pylori* stool antigen

Table 1: Distribution of *H. pylori* infection based on gender

Variables	<i>H. pylori</i>	
	Positive (%)	Negative (%)
Male (n=240)	60 (25)	180 (75)
Female (n=270)	42 (15.56)	228 (84.44)
Total (n=510)	102 (20)	408 (80)

The infection rate was higher among males (25%) compared to females (15.56%) (Table 1). In the present study population age groups of 41-60 were found to be affected more (23.40%) (Table 2).

Table 5: *H. pylori* infection and various symptoms presented by the dyspeptic patient

Variables	Options	<i>H. pylori</i> infection		Total	p-value
		Positive (%)	Negative (%)		
Nausea	Yes	45 (19.15)	190 (80.85)	235	0.0382
	No	57 (20.73)	218 (79.27)	275	
Vomiting	Yes	40 (33.33)	80 (66.67)	120	0.0004
	No	62 (15.90)	328 (84.10)	390	
Heartburn	Yes	60 (15.79)	320 (84.21)	380	0.0004
	No	42 (32.31)	88 (67.69)	130	
Sour eruption	Yes	65 (33.33)	130 (66.67)	195	0.0002
	No	37 (11.75)	278 (88.25)	315	
Bloating	Yes	55 (21.57)	200 (78.43)	255	0.0069
	No	47 (18.43)	208 (81.57)	255	
Bleaching	Yes	50 (21.28)	185 (78.72)	235	0.0171
	No	52 (18.91)	223 (81.09)	275	
Dyspepsia	Yes	35 (53.85)	30 (46.15)	65	0.0001
	No	67 (15.06)	378 (84.94)	445	
Weight loss	Yes	18 (33.96)	35 (66.04)	53	0.0009
	No	84 (18.38)	373 (81.62)	457	

Table 2: Distribution of *H. pylori* infection in the different age groups

Age group (years)	<i>H. pylori</i>	
	Positive No. (%)	Negative No. (%)
11-20	8 (16.00)	42 (84.00)
21-30	40 (19.05)	170 (80.95)
41-60	44 (23.40)	144 (76.60)
>60	10 (16.13)	52 (83.87)
Total	102 (20.00)	408 (80.00)

The infection rate was higher (22.47%) among families with a higher number of members (>5), compared to 17.28% among small families with members (≤ 5) (Table 3).

Table 3: Distribution of *H. pylori* infection based on the number of family numbers

No. of family members	<i>H. pylori</i> infection	
	Positive No. (%)	Negative No. (%)
≤ 5	42 (17.28)	201 (82.72)
> 5	60 (22.47)	207 (77.53)
Total	102 (20.00)	408 (80.00)

People with higher education are less likely (10.57%) to be affected by the infection when compared to uneducated or educated up to the primary level (40.63%) (Table 4).

Table 4: Education of people infected by *H. pylori*

Family education	<i>H. pylori</i> infection	
	Positive No. (%)	Negative No. (%)
Basic level	65 (40.63)	95 (59.37)
Secondary and above	37 (10.57)	313 (89.43)
Total	102 (20.00)	408 (80.00)

Among the variables in *H. pylori* infection and various clinical symptoms presented by dyspeptic patients, all the variables were statistically significant (Table 5).

Table 6: *H. pylori* infection and various lifestyles finding among patients

Variables	H. pylori infection			Total	p-value
	Options	Positive (%)	Negative (%)		
Smoking	Yes	62 (32.29)	130 (67.71)	192	0.0002
	No	40 (12.58)	278 (87.42)	318	
Alcohol	Yes	60 (30.30)	138 (69.70)	198	0.0003
	No	42 (13.46)	270 (86.54)	312	
Tobacco	Yes	40 (22.22)	140 (77.78)	180	0.0088
	No	62 (18.79)	268 (81.21)	330	
Diet	Vegetarian	35 (21.87)	125 (78.13)	160	0.0147
	Non-Vegetarian	67 (19.14)	283 (80.86)	350	
Socio-economic status	Poor	20 (33.33)	60 (66.67)	80	0.0018
	Average	60 (17.49)	283 (82.51)	343	
	Well-to-do	22 (25.29)	65 (74.71)	87	

People with a habit of smoking, alcohol, and tobacco consumption were more prone to infection. Non-vegetarians and vegetarians had an almost similar frequency of infection (Table 6).

DISCUSSION

The present study described the seroprevalence of *Helicobacter pylori* infection among dyspeptic patients attending CMC-TH and its association with different factors such as socio-demographic variables including age, sex, family size, and family education, their lifestyle, and also the association with clinical symptoms presented by dyspeptic patients.

In our study, HpSAg was detected among 20% of the study population. A similar finding (22.1%) was reported by Syam et al.¹⁰ Infection rate was higher among males (25%) compared to females (15.56%). Similar higher frequency (male 56.3% VS female 43.7%) was reported by Joshi et al., 2018¹¹ and (male 55% VS female 51.4%) by Omosor et al. 2017.¹² The reason may be due to more exposure of males to alcohol, smoking, tobacco, and unhealthy and untimely diets.

In our study population age groups of 41-60 were found to be affected more (23.40%). A similar finding (23.9% among 35-54 years) has been reported by Joshi et al.¹¹ In addition to this finding; Syam et al,¹⁰ also showed that the age group of 40-49 years was affected in higher frequency. Since our study showed the prevalence of *H. pylori* in middle age group patients, the reason could be possibly due to a busy work schedule along with inappropriate and untimely food habits. The infection rate was higher (22.47%) among families with a higher number of members (>5), compared to 17.28% among small families with members (≤ 5). This result was similar to the finding of Ansari et al.¹³

Our study showed that people with higher education are less likely (10.57%) to be affected by the infection when compared to uneducated or educated up to the primary level (40.63%). A similar higher frequency (75%) of infection among people with education below primary level has been reported by Ansari et al.¹³ This may be due to the maintenance of hygiene, cleanliness, and awareness regarding the infection among educated people.

Among the variables in *H. pylori* infection and various clinical symptoms presented by dyspeptic patients, including nausea, vomiting, heartburn, sour eructation, bloating, bleaching, dysphagia, and weight loss. All the variables were statistically significant. Mabkeu et al.¹⁴ also reported a higher frequency of symptoms like heartburn, burping, among persons with *H. pylori* infection. However, vomiting was not seen in infected people when compared to apparently healthy individuals. The presence of sour eructation in the *H. pylori* infection is possibly due to the increased acidic environment in the gastric region by the bacteria.

Under the association of *H. pylori* infection with the lifestyle of the patients, our study showed that people with a habit of smoking, alcohol, and tobacco consumption were more prone to the infection. Non-vegetarians and vegetarians had an almost similar frequency of infection. This is by the finding of Shrestha et al.¹⁵ Families with the low or average socio-economic condition were infected more than well-to-do families. Similar findings have been reported by Mabeku et al.¹⁴ It also states that poverty enhanced the level of transmission due to malnutrition, poor hygiene, and unaffordable health care.

The limitation of the study was that all the participants who participated were patients with some symptoms of dyspepsia who visited Gastroenterology OPD; a community-based study is required to reveal the exact scenario of *H. pylori* infection in Chitwan, Nepal.

CONCLUSION

The burden of *H. pylori* infection in patients with dyspepsia was high. Prevalence was higher among males compared to females. Factors associated with an elevated level of colonization by *H. pylori* leading to dyspepsia were low income, education up to the primary or illiterate, habits like smoking, alcohol, and tobacco consumption.

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CONFLICT OF INTEREST: None

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