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Prevalence of helicobacter pylori infection and hygiene practices among people with active gastritis

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Abstract

Background: Intestinal infections with *Helicobacter pylori* mainly occur during childhood. If contracted, these infections may cause chronic gastritis, frequently leading to peptic ulcer disease in later life. This study aims to detect the prevalence of *H. pylori* infections in patients with active gastritis.

Methods: The study included 150 participants who were consuming daily anti-gastritis drugs to reduce the gas and were considered active gastritis patients and were recruited from Pokhara metropolitan-30, from May 2018 to March 2019. They were screened for *H. pylori* antibodies for detection of infection by the immunochromatographic rapid detection kit, and the data were analyzed using SPSS 2016.

Results: Serum anti-*Helicobacter pylori* antibodies were used to detect the presence of *H. pylori* in these participants. Among the 150 participants, 54 were males (36%) and 96 were females (64%). The results showed that 47(31.3%) of the patients were positive for anti-*H. pylori* test. The age group 30 to 40 had the highest prevalence of 21(14.0%). Using public water as a source of drinking water showed the highest prevalence of *H. pylori* with a *P* value of 0.04.

Conclusion: There should be an additional aspect required for the diagnosis and treatment of gastritis, which is the healthcare providers' and patients' awareness of the cause and most efficient treatments for this medical condition. Using only anti-gastritis drugs is not sufficient; treatment against *H. pylori* requires the right pathway of treatment by the use of several antibiotics.

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Introduction

Helicobacter pylori (H. pylori) is a spiral-shaped microaerophilic gram-negative bacterium (1). It is helix-shaped, which is thought to have evolved to penetrate the mucous lining of the stomach (2). It leads to the development of chronic gastritis, gastric ulcers, duodenal ulcers, and mucosal atrophy. Additionally, *Helicobacter pylori* is recognized as a class I cancer-causing agent because long-lasting inflammation and atrophy can further lead to malignant transformation (3, 4). At least half the world's population is infected by this bacterium, making it the most widespread infection in the world, especially in the developing world, where rates are estimated to be around 80% (5).

H. pylori infection is an important global infection with a worldwide prevalence of about 50 % (6, 7). This infection is mostly acquired during childhood through the fecal-oral and oral-oral routes (8, 9). Early infection with this bacterium is usually silent, but symptoms and pathologic changes occur later in life. The clinical conditions and pathologic changes associated with *H. pylori* infection include gastritis, gastric and duodenal ulcers, gastric cancers, iron deficiency anemia, and idiopathic thrombocytopenic purpura (ITP) (10-13).

H. pylori infection shows a variety of geographic distribution on both local communities and large global scales. These variations are mostly due to socioeconomically driven factors such as sex, age, genetic tendency, ethnicity, level of education, and sanitation, which decide the rate and prevalence of this worldwide infection (14-16).

In developing countries, *H. pylori* is found to be the most common human infection globally. In developing countries, more than 80% of the population test positive for *H. pylori* (14,17,18).

The main objective of this study was to determine the *H. pylori* infection in the population of Lekhnath municipality of Kaski district to assess the risk factors for *H. pylori* by an extended anamnesis, involving data on sex, age, educational level, smoking, drinking, as well as dietary factors.

Methods

A community-based cross-sectional study was carried out from 2018/5/7 to 2019/03/01 at Pokhara 30, earlier known as Lekhnath. Samples were collected from Khudi, Dhungepatan, and the Powerhouse area of Pokhara-30. Only those with active gastritis who were on PPI (Protein Pump Inhibitor) as gas-reducing drugs were included in our study.

Participants were verbally informed about the study, and written consent was obtained from eligible patients. Then, the questions were asked as per our questionnaire format to obtain the data on age, sex, education, address, source of drinking water, and others. Blood samples were collected in plain tubes labeled with unique code numbers and centrifuged to get serum. The samples were processed at the Microbiology Laboratory of the School of Health and Allied Sciences, Pokhara University. The samples were processed for antibodies against H. pylori by a rapid diagnostic kit based on immunochromatographic methods, which were manufactured by CTK Diagnostics, China. Two to three drops of serum sample were placed in the sample wells by the dropper given in the kit, and the diluter was placed in D wells. The samples started to move, and the reading commenced within five minutes. If there was line formation in the test and control, it was regarded as positive; if there was a line formation in only the control line, the test was negative; if the line was formed at the test only, then the test was invalid.

Ethical permission was obtained from the Institutional Review Committee, Pokhara University, for ethical clearance (Ref no. 197/074/75). The permission was obtained from the Pokhara Metropolitan-30 ward office.

All of the data was analyzed using SPSS version 16.0. The frequency of incidence of different independent variables and dependent variables was calculated. Correlation between measured parameters was assessed using the analytical methods of Pearson's Chi-square test, and $p<0.05$ was considered statistically significant.

Results

The present study was conducted on 150 participants with active gastritis. Active gastritis was confined by those who were taking anti-gastritis drugs to reduce the gas formation on a daily basis in the Lekhnath community, now known as Pokhara-30. *H. Pylori* antibodies were used for *H. pylori* infection diagnosis for all participants, along with their history and socio-demographic information. All participants were provided with the reports, and positive cases were advised for follow-up. In this study, out of 150 participants, 3 (2.0%) were of age group <20 years, 17 (11.3%) were 20 to 30 years, 51(34.0%) were 30 to 40 years, and 79 (52.7%) were >40 years. Similarly, 96 (64%) females and 54 (36%) males were included in our study. This study included 142 (94.7%) married and 8 (5.3%) unmarried individuals, and other details are demonstrated in Table 1. Similarly, *H. pylori* antibody was detected to identify the status of infectious gastritis of participants during the study. In this regard, 103 (68.7%) were negative for *H. pylori*, and 47 (31.3%) were positive, which demonstrated the infection as the cause of gastritis.

Associations were seen in different variables, as given in the tables below. Out of 47 positive cases of H. pylori, in terms of age, the prevalence was highest in the 30 to 40-year-old age group (14.0%). The prevalence was higher in females with 32 (21.3%) than in males with 15 (10.0%). Similarly, the prevalence was highest in people living in Khudi (18.0%) among four test areas of Lekhnath-30. Participants who were married showed the highest prevalence of 44 (29.3%) compared to unmarried participants 3(2.0%). There was a significant relationship between *H. pylori* infection and occupation, with a P-value of 0.05, and the prevalence was highest among housewives. Similarly, the condition was more

prevalent among 15 individuals who had a middle school education (10.0%), as demonstrated in Table 1.

Table 1. The relationship between age and sex of the participants and *H. pylori*

Variables	Frequency (n)	Percentages (%)	*H. pylori*		Chi-square	P-value
			Negative	Positive		
Age categorization						
Younger than 20	3	2.0	3 (2%)	0 (.0%)	6.378	0.605
20 to 30	17	11.3	10 (6.7%)	7 (4.7%)		
30 to 40	51	34.0	30 (20.0%)	21 (14.0%)		
Older than 40	79	52.7	60 (40.0%)	19 (12.7%)		
Sex						
Female	96	64	64 (42.7%)	32 (21.3%)	8.378	0.405
Male	54	36	39 (26.0%)	15 (10.0%)		
Total	150	100	103 (68.7%)	47 (31.3%)		

H. pylori infection was strongly associated with the consumption of various qualities of water. Among 47 (31.3%) individuals with *H. pylori*, 22(14.7%) consumed bottled water, whereas 25(16.7%) used running water, which showed a strong association with P-value 0.04, as shown in Table 2. Anti-gas-reducing drugs showed a statistically significant association with *H. pylori*, as shown in Table 3.

Table 2. The association between *H. pylori*, smoking habits, and the source of drinking water

Variables	*H. pylori*		Chi-square	P-value
	Negative	Positive		
Smoking				
No	80 (53.3%)	42 (28.0%)	2.906	0.05
Yes	23 (15.3%)	5 (3.3%)		
Source of drinking water				
Bottled	62 (41.3%)	22 (14.7%)	2.347	0.04
Public Network	41 (27.3%)	25 (16.7%)		
Total	103 (68.7%)	47 (31.3%)		

Table 3. Association of *H pylori* with gas-reducing drugs

Variables	*H. pylori*		Chi-square	P-value
	Negative	Positive		
Drug history for reducing gas				
Aciloc	15 (10.0%)	4 (2.7%)	3.177	0.05
Ayurvedic for gastritis	13(8.7%)	4 (2.7)		
Unknown	46 (30.7%)	26 (17.3%)		
Omeprazole	5 (3.3%)	2 (1.3%)		
Pantoprazole	22 (14.7%)	11 (7.3%)		
Rabeprazole	2 (1.3%)	0 (0.0%)		
Total	103 (68.7%)	47 (31.3%)		

Discussion

This is a cross-sectional study on individuals with active gastritis. In our study, a total number of 150 samples was collected. Out of 150 samples, 47 (31.3%) were found to be positive and 103 (68.7%) negatives for *H. pylori*. The age group 30 to 40 years showed the highest prevalence of (14.0%) comparatively more than 40 years age group (12.7%) and 20-30 years age group (4.7%). The prevalence was higher in females, 32 individuals (21.3%), than in males, 15 participants (10.0%).

The prevalence of H. pylori among individuals with active gastritis was lower in our study (31.3%) than in the study by Agbor et al., which reported 43.4% (19). Moreover, H. pylori infections are comparatively more prevalent in studies conducted by Zhu et al. 63.41% (20), Mynepalli et al. 59.0% (21), and Adlekha et al. 59.4% (22). However, Awuku et al. (23) found a lower prevalence of 14.2% than our study. Similarly, a previous study by Hoang et al. in Vietnam reported a seroprevalence of 36.7% (24) and Correa et al. 36.4% (25), which are comparatively similar to our study. These differences in prevalence may be due to the improvement in the socioeconomic status and hygiene condition of the society over time.

In terms of age, the prevalence was higher in the age group 30 to 40 years (14.0%) than older than 40 years age group (12.7%) and the group between 20 and 30 (4.7%) and was lowest in the age group younger than 20 (0.0%). This may be due to the aging process, which is associated with a diminished epithelial cell turnover rate and reduced capacity to repair the gastric mucosa (26), which has been attributed to decreasing prostaglandin levels in the gastric mucosa, which makes age a major risk factor for H. pylori colonization (27). WHO has reported that the majority of infections occurred in young and middle age groups (25 to 50 years) more than in other age groups, and the factors that predispose the higher colonization rates included poor socioeconomic status and less education in addition to genetic factors. The prevalence was higher in females (68 %) than in males (32 %), which is similar to a study by Mynepalli et al. et al. 62.7% (21) and Agbor et al. 45.5 % (19). Participants who were married, 44 persons, showed a higher prevalence (29.3%) than the unmarried ones, who were 3 (2.0%).

Similarly, there was no association between alcohol consumption and H. pylori infection in our study. However, a study by Agbor et al. showed that H. pylori infection was higher among alcohol consumers (51.1%) than among those who had never drunk (40.3%) (19). Similarly, the infection rate was higher among smokers than non-smokers, which is similar to the study done by Hanafi MI et al. (28). This suggests that smoking may also be a risk factor for H. pylori infection. Higher prevalence was found among individuals who consumed public running water instead of pure bottled water.

Conclusion

Although the participants used gastric drugs, the prevalence of *H. pylori* in these individuals was higher. *H. pylori* was more prevalent among females than males and was more common in the age group 30 to 40 years. The result of our research highlights the importance of periodic screening and checkups in order to detect the infecting agent among active gastritis patients. Complete cure of infective gastritis requires anti-*H. pylori* drugs and gastritis drugs are insufficient on their own.

Public awareness and health education programs are necessary to heighten the awareness of people with gastritis and its consequences, including ulcers. Awareness-raising campaigns should be focused on sanitation and prevention control of *H. pylori* infection.

Limitation

Since this study was focused on a small population large scale population should be focused to carry the research. Other tests like molecular testing were not carried.

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Ethical statement

Ethical permission was obtained from the Pokhara University Research Centre (Ref no. 197/074/75) to undertake the study.

Conflicts of interest

The authors declare no conflict of interest.

Author contributions

Suresh Jaiswal and Bijay Subedi: Conceptualization, Methodology, Data Analysis, Writing, and Editing: Ashmita Sapkota, Pushpa Sharma, Manisha Timisina and Maheshwar Timilsina: Investigation, Data collection, Data analysis, and Writing (Original Draft). Bishnu raj Tiwari: Editing original draft.

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