

Original Research Article

TO STUDY THE PREVALENCE OF HELICOBACTER PYLORI INFECTION IN DYSPEPTIC PATIENT

Saksham¹, Subash Chandra Joshi², Vivekanand Satyawali³, Ravi Singh⁴, Arun Joshi⁵, Smarika Bhatt¹

¹Post Graduate, Department of General Medicine, GMC Haldwani, Uttarakhand, India

²Professor and Head, Department of General Medicine, GMC Haldwani, Uttarakhand, India

³Professor and Head, Department of General Medicine, GDMC Dehradun, Uttarakhand, India

⁴Assistant Professor, Department of General Medicine, GMC Haldwani, Uttarakhand, India

⁵Professor, Department of General Medicine, GMC Haldwani, Uttarakhand, India

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Corresponding Author:

Dr. Ravi Singh,
Assistant Professor, Department of
General Medicine, GMC Haldwani,
Uttarakhand, India.
Email:
ravisinghhdharamshaktu4u2@gmail.com

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ABSTRACT

Background: The aim of the present study was to assess the prevalence of helicobacter pylori infection in Dyspeptic patient.

Materials and Methods: The present study was hospital based Cross Sectional Study based on Primary data collected from the patients for the period of 18 months. The consent was taken from the patients before collecting the data. The study included a total of 300 patients presented at Department of General Medicine at Dr. Susheela Tiwari Memorial Govt. Hospital, GMC Haldwani, Nainital, Uttarakhand.

Results: Out of 300 patients, 215 (71.7%) tested positive for H. pylori infection. Males (54.3%) slightly outnumbered females (45.7%), and the majority of patients (45%) belonged to the 41–60 years age group. Most participants were from lower-middle socioeconomic backgrounds, and a significant proportion had low levels of formal education. Among presenting symptoms, postprandial fullness (79.0%), early satiety (67.7%), and epigastric burning (40.0%) were the most common and showed statistically significant associations with H. pylori positivity ($p < 0.05$). Endoscopic findings among H. pylori-positive patients revealed antral gastritis as the most common diagnosis (39.1%), followed by peptic ulcer disease (5.6%) and erosive pangastritis (4.2%).

Conclusion: This study confirms a high prevalence (71.7%) of Helicobacter pylori infection among dyspeptic patients in the Kumaon region of Uttarakhand. The infection is notably associated with postprandial fullness, early satiety, and epigastric burning. Antral gastritis emerged as the predominant endoscopic finding. The results highlight the need for early diagnostic screening and targeted intervention strategies, particularly among middle-aged adults from lower socioeconomic backgrounds.

Keywords: Prevalence, helicobacter pylori infection, Dyspeptic patient.

INTRODUCTION

Dyspepsia is a common clinical condition encountered in both primary care and hospital settings, broadly characterized by upper abdominal discomfort or pain, bloating, early satiety, postprandial fullness, and nausea. It is estimated to affect up to 20–40% of the general population worldwide, significantly impairing quality of life and leading to increased healthcare utilization.^[1] Among the many etiologies of dyspepsia, Helicobacter pylori (H. pylori) infection is recognized as a key contributing factor. The impact of dyspepsia on

health systems is considerable. Patients with chronic dyspepsia frequently undergo repeated diagnostic procedures, including upper gastrointestinal endoscopy, abdominal ultrasonography, and various laboratory investigations. Despite this, many do not receive a definitive diagnosis. Moreover, dyspeptic symptoms often overlap with other gastrointestinal conditions such as GERD, irritable bowel syndrome, and biliary disorders, making clinical differentiation challenging. This diagnostic uncertainty reinforces the need to understand the contribution of treatable factors such as H. pylori infection.

H. pylori is a spiral-shaped, micro aerophilic, gram-negative bacterium that colonizes the gastric mucosa. Since its discovery by Warren and Marshall in 1982, this organism has been extensively studied for its role in the pathogenesis of various gastroduodenal diseases.^[2] The bacterium is implicated in the development of chronic gastritis, peptic ulcer disease, mucosa-associated lymphoid tissue (MALT) lymphoma, and is classified as a Group I carcinogen for gastric adenocarcinoma by the World Health Organization.^[3]

H. pylori infection is typically acquired during childhood and persists throughout life unless treated. Transmission occurs mainly via the fecal-oral or oral-oral route. Environmental factors such as poor sanitation, crowded living conditions, and contaminated water are significant risk factors, particularly in low-income countries. Host genetic susceptibility and bacterial virulence factors such as cytotoxin-associated gene A (CagA) and vacuolating cytotoxin A (VacA) also influence the clinical outcomes. The global prevalence of *H. pylori* infection remains high, with considerable geographic variability. In developing countries, the prevalence exceeds 70% in some regions, while it is lower in developed nations, ranging from 30–50%.^[4] The variation is influenced by factors such as socioeconomic status, hygiene practices, overcrowding, and access to clean water. In India, studies have reported a prevalence ranging between 50% and 80%, depending on the population and diagnostic method used.^[5]

From a public health perspective, early detection and effective eradication of *H. pylori* in dyspeptic patients could potentially reduce the incidence of peptic ulcer disease and gastric cancer. This is especially relevant in countries like India, where the burden of gastric malignancy remains high, and early diagnosis is often delayed due to lack of awareness and limited access to healthcare facilities. Therefore, systematic evaluation of *H. pylori* prevalence in symptomatic individuals remains crucial for guiding treatment policies and prioritizing public health interventions.

The aim of the present study was to assess the prevalence of *helicobacter pylori* infection in Dyspeptic patient.

MATERIALS AND METHODS

The present study was hospital based Cross Sectional Study based on Primary data collected from the patients for the period of 18 months. The consent was taken from the patients before collecting the data. The study included a total of 300 patients presented at Department of General Medicine at Dr. Susheela Tiwari Memorial Govt. Hospital, GMC Haldwani, Nainital, Uttarakhand.

The study was conducted on primary data collected from all the Indoor/Outdoor patients presented at Dr. Susheela Tiwari Memorial Govt. Hospital, GMC

Haldwani, Nainital, Uttarakhand. during the time period of the study. The data was collected after taking proper history and detailed clinical examination of Indoor/Outdoor patients of Department of General Medicine at Dr. Susheela Tiwari Memorial Govt. Hospital, GMC Haldwani, Nainital, Uttarakhand.

Inclusion Criteria

- Patients above the age of 16 years.
- Patients with dyspeptic symptoms presenting with:
 - Post Prandial Fullness or Early Satiety lasting for three months with system onset having occurred at least six months before, at least once a week.
 - Epigastric pain or epigastric burning sensation lasting for three months with system onset having occurred at least six months before, at least once a week.
- Dyspepsia patients having alarm symptoms like weight loss, uppergastrointestinal bleed, dysphagia etc.,

Exclusion Criteria

- Patients who have not given informed consent to participate in the study.
- Known case of any type of gastric malignancy, *helicobacter pylori* related peptic ulcer disease.
- Patients below the age of 16 years.

Methodology: The study is based on primary data collected through convenient sampling method. 300 patients were selected, irrespective of their age and gender at department of general medicine at GMC Haldwani, during the period of the study. Thereafter, applying statistical techniques, the results were obtained and analysed. All baseline blood investigations were done in the Dept. of Biochemistry and Dept. of Pathology, GMC Haldwani.

Tests performed: Biopsy, Rapid Urease Test (RUT), Endoscopy

Data Management: All filled questionnaires were coded before entering data into the computer. Data cleaning was done by using consistence checks. Frequency distribution tables were used to summarize the data. Data was presented as number of patients, mean and percentages. The data, thus collected, was analyzed on Microsoft Excel 2007. Thereafter, Chi-square test was employed.

Chi-Square Test: The Chi-square (χ^2) test is a non-parametric statistical test used to determine whether there is a significant association between two categorical variables. It compares the observed frequencies in each category of a contingency table with the frequencies that would be expected if there were no relationship between the variables.

In the present study, the Chi-square test was applied to evaluate associations between categorical variables. The calculated Chi-square value is then compared with the critical value from the Chi-square distribution table at the desired level of significance (usually $p < 0.05$). If the calculated value exceeds the critical value, the null hypothesis (that there is no association between the variables) is rejected.

For this study, statistical significance was considered at $p < 0.05$.

Ethical considerations: Prior to data collection, ethical clearance was sought from the Ethical Committee, Government Medical College, Haldwani, Uttarakhand. Permission to conduct the study was obtained from Government Medical College, Haldwani administration.

Each patient was asked to sign a written consent for the purpose of participating in this study, which included details of all invasive procedures, benefits and potential complications. All information obtained from study participants was kept confidential, and shared only with the attending health care personnel involved. All patients enrolled in the study received all routine services while admitted in the medical ward.

RESULTS

Table 1: Baseline characteristics

Gender	Number of Patients	Percentage (%)
Male	163	54.3%
Female	137	45.7%
Total	300	100%
Age Group	Female (n)	Male (n)
< 20 years	10	8
21–40 years	53	49
41–60 years	56	79
61–80 years	16	26
> 80 years	2	1
Education Level	Frequency	Percentage (%)
No Formal Education	90	30.0%
Primary School	70	23.3%
High School	60	20.0%
Intermediate	50	16.7%
Graduate	28	9.3%
Post Graduate	2	0.7%
Area		
Rural	140	46.7%
Urban	160	53.3%

In the present study, which included a total of 300 dyspeptic patients, the gender-wise distribution revealed that 163 patients (54.3%) were male and 137 patients (45.7%) were female. The majority of patients belonged to the 41–60 years age group, accounting for 135 individuals (56 females and 79 males), indicating a higher burden of dyspepsia in middle-aged adults. The 21–40 years age group followed closely with 102 patients (53 females and 49 males), suggesting that younger adults also

constitute a significant proportion of the dyspeptic population. High school education was observed in 60 patients (20%), and 50 patients (16.7%) had studied up to the intermediate level. Only a small percentage had higher education, with 28 patients (9.3%) being graduates and just 2 patients (0.7%) having postgraduate qualifications. Out of the 300 dyspeptic patients studied, 140 (46.7%) were from rural areas, while 160 (53.3%) were from urban areas.

Table 2: Social Class Distribution of the Study Population

Socio-Economic Status	Frequency	Percentage (%)
Lower	37	12.3%
Lower Middle	158	52.7%
Upper Lower	14	4.7%
Upper Middle	76	25.3%
Upper	15	5.0%
Total	300	100%

158 patients (52.7%)—belonged to the lower middle socioeconomic class, indicating that over half of the participants had modest economic means but likely some level of education and access to basic healthcare. Patients from the upper middle class

accounted for 25.3% of the population, and those from the upper class made up only 5%, suggesting that individuals from higher income groups may either experience fewer symptoms or seek care in private facilities instead of government hospitals.

Table 3: Presenting Complaints

Symptom	Present	Absent	Present Percentage (%)
Post Prandial Fullness	237	63	79.0
Early Satiety	203	97	67.7
Epigastric Burning	122	178	40.0
Epigastric Pain	90	210	30.0

Early satiety was reported by 203 patients (67.7%), also indicating a substantial burden of discomfort following meals. On the other hand, epigastric

burning was noted in 122 patients (40%), while epigastric pain was the least common symptom, present in 90 patients (30%).

Table 4: Alarming Symptoms

Symptom	Number of Patients	Percentage (%)
Loss of Appetite	43	14.3
Weight Loss	14	4.7
Upper GI Bleed	2	0.7
Severe Anemia	1	0.3

Loss of appetite was the most frequently reported additional symptom, seen in 43 patients (14.3%). This indicates that appetite disturbance is a relatively common accompanying complaint in patients with

dyspepsia and may suggest chronic gastrointestinal irritation or infection. Weight loss was observed in 14 patients (4.7%), which, although less frequent, is clinically significant.

Table 5: Distribution of Helicobacter pylori Positivity by Diagnostic Method and Sex

Diagnostic Method	Female Positive	Male Positive	Total Positive
IgG Serology	22	35	57
Stool Antigen	12	12	24
Biopsy	6	8	14
RUT	57	62	119

The IgG serology test showed positivity in 57 patients, with 35 males and 22 females, indicating a higher seroprevalence of *H. pylori* antibodies in males. The stool antigen test detected *H. pylori* in 24

patients, with an equal distribution between males and females (12 each), suggesting a comparable current infection rate in both sexes.

Table 6: Prevalence of Helicobacter pylori Infection among Study Participants

H. pylori Status	Number of Patients	Percentage (%)
H. pylori Positive	215	71.7%
H. pylori Negative	85	28.3%
Total	300	100%

Biopsy-based detection confirmed *H. pylori* in 14 cases, including 8 males and 6 females, again showing a slightly higher positivity in males. The rapid urease test (RUT) had the highest number of

positive detections at 119 cases, comprising 62 males and 57 females, highlighting its superior detection rate in this population.

Table 7: Association of Dyspeptic Symptoms with H. pylori Positivity in Study Participants

Symptom	H. pylori Positive with Symptom	P-value
Post Prandial Fullness	56	0.017
Early Satiety	51	0.012
Epigastric Burning	40	0.008
Epigastric Pain	26	0.079

Postprandial fullness was reported in 56 *H. pylori*-positive patients and showed a significant association with a p-value of 0.017. Similarly, early satiety was found in 51 *H. pylori*-positive individuals, also demonstrating a statistically significant relationship ($p = 0.012$). Epigastric burning was present in 40

patients who tested positive for *H. pylori*, and this symptom showed the strongest association among all, with a p-value of 0.008. In contrast, epigastric pain was observed in 26 *H. pylori*-positive patients but did not show a statistically significant association ($p = 0.079$).

Table 8: Endoscopic Findings among H. pylori Positive Patients (n = 215)

Endoscopic Finding	Number of Patients	Percentage (%)
Antral gastritis	84	39.1%
Peptic ulcer disease	12	5.6%
Erosive pangastritis	9	4.2%
Normal study	8	3.7%

Among the 215 patients who tested positive for *Helicobacter pylori* infection, the most common endoscopic finding was antral gastritis, observed in 84 patients, accounting for 39.1 percent of the total.

DISCUSSION

The present chapter synthesizes the findings of our hospital-based cross-sectional study on *Helicobacter*

pylori among adults presenting with dyspepsia to Dr. Sushila Tiwari Government Hospital, Haldwani. Our analytic sample comprised 300 consecutive patients, with 163 males (54.3%) and 137 females (45.7%). Age was broadly distributed, but middle age predominated: 21–40 years constituted 34.0% (102/300), 41–60 years 45.0% (135/300), 61–80 years 14.0% (42/300), with smaller tails in the <20 (6.0%, 18/300) and >80 (1.0%, 3/300) bands. Slightly more participants resided in urban localities (53.3%, 160/300) than rural (46.7%, 140/300). Educational attainment skewed toward lower levels—30.0% (90/300) had no formal schooling and 23.3% (70/300) primary education—mirroring the socioeconomic profile in which just over half were from lower-middle strata (52.7%, 158/300).

Several Indian studies have reported similar gender and age patterns in *H. pylori*-positive dyspeptic patients. For instance, Sharma et al.^[6] (2020) in a tertiary-care series from Rajasthan found a slight male predominance (56.8%) among infected dyspeptic adults, with the highest prevalence in the 41–60-year age group, mirroring our results. Likewise, Khan et al.^[7] (2017) in a hospital-based study from Pakistan observed that middle-aged adults (31–50 years) comprised the largest infected cohort, while males accounted for 53% of positive cases. In the Sikkim study by Dhakal and Dhakal (2018),^[8] men also showed higher infection rates than women, and peak presentation occurred in midlife, supporting the view that symptomatic *H. pylori* infection tends to manifest most often in middle adulthood, with modest male excess in clinic-based populations. These consistencies strengthen the external validity of our demographic findings and suggest that they are representative of broader patterns in South Asia rather than idiosyncratic to our setting.

The most frequent dyspeptic complaints were postprandial fullness (79.0%, 237/300), early satiety (67.7%, 203/300), epigastric burning (40.0%, 122/300), and epigastric pain (30.0%, 90/300). Sharma et al.^[6] (2020) reported postprandial fullness (74.2%) and epigastric burning (41.3%) as the most common symptoms among *H. pylori*-positive patients, closely matching our observed frequencies. Dhakal and Dhakal,^[8] (2018) also described epigastric discomfort, bloating, and nausea as the commonest manifestations, supporting the notion that while symptom percentages may differ between centers, the broad pattern of postprandial distress, burning, and episodic pain is a recurring clinical signature of *H. pylori*-associated dyspepsia in the Indian subcontinent. Alarm features were relatively uncommon: loss of appetite (14.3%), weight loss (4.7%), upper GI bleed (0.7%), and severe anemia (0.3%). These figures establish a symptomatic and sociodemographic milieu typical of public-sector gastroenterology services in northern India and provide the basis for interpreting *H. pylori* patterns. The overall *H. pylori* positivity in our cohort was 71.7% (215/300). This estimate is high in absolute terms and sits at the upper end of reported ranges for

dyspeptic populations globally, but it remains plausible for South Asia given known epidemiology. A landmark global meta-analysis by Hooi et al.^[4] (2017) estimated a pooled worldwide prevalence of 44.3% in the general population, with marked regional heterogeneity; prevalence in many Asian settings was substantially higher than in Western Europe and North America. Importantly, dyspeptic clinic cohorts often outstrip general population baselines because they are enriched for individuals with acid-related and inflammatory gastroduodenal disease. Our figure thus exceeds the global general-population average but aligns with high-burden Asian settings.

Within India, prevalence among symptomatic or endoscopy-referred patients varies widely by geography, referral patterns, and diagnostic methods used (single versus combined tests). For example, a hospital-based endoscopy study from Sikkim reported an overall *H. pylori* positivity of 27% using rapid urease test (RUT) and histology in selected cases, emphasizing that cost and test availability likely under-diagnosed active infection; gastritis (particularly antral) was the commonest endoscopic correlate (Dhakal and Dhakal 2018).^[8] The relatively low Sikkim figure underscores how case selection and testing strategies can depress apparent prevalence. In contrast, our study used a broader diagnostic palette (RUT, IgG serology, stool antigen, and biopsy), which raises diagnostic yield for current or past infection and likely contributes to our higher overall positivity.

Males formed a slight majority in our sample (54.3%). Age-wise, 41–60 years comprised the single largest block (45.0%), followed by 21–40 years (34.0%). The gender skew and middle-age predominance are in line with many Indian hospital cohorts where care-seeking behavior and occupational exposures (e.g., irregular meals, analgesic use) differ by sex, while infection is usually acquired in childhood and manifests clinically decades later. Several Indian and regional reports note either a male preponderance among *H. pylori*-positive dyspeptics or no significant sex difference; the Sikkim endoscopy series, for instance, documented higher prevalence in men than women. Our distribution therefore resides comfortably within the spectrum of prior observations. In terms of age, *H. pylori* is typically acquired in childhood, after which cohort effects and birth-cohort sanitation improvements drive apparent age gradients. Our mid-life concentration (with a secondary tail into older ages) mirrors the “latency” between early acquisition and adult symptomatic presentation described in regional syntheses (Hooi et al. 2017).^[4] While our analysis chapter did not stratify infection positivity by each age band, the overall age profile of clinic attendees is similar to that in other Indian endoscopy-based cohorts, where 30–60 year olds predominate. Similar socio-educational distributions have been documented across South Asia. Siddique et al.^[9] (2019) in Uttar Pradesh noted a stepwise decline in

prevalence with increasing educational level and better housing conditions, while Malhotra et al,^[10] (2012) in Chandigarh linked infection risk to shared sanitation facilities and limited formal education. A Bangladeshi hospital study by Ahmed et al,^[11] (2021) further reinforced that low income, overcrowding, and low education are consistent predictors of infection, underscoring the persistence of these structural determinants across the region.

Notably, we observed a slightly urban-leaning catchment (53.3% urban). This likely reflects hospital accessibility rather than a protective effect of urban residence per se. It is well established that within-country variation is substantial, and “urban” in India encompasses large informal settlements with overcrowding and intermittent water supply. Without community-based sampling and contemporaneous environmental data, we caution against over-interpreting the rural–urban split in our clinic cohort as indicative of true population differences; rather, it is a service-use pattern layered upon an inherently high-risk environment for early-life acquisition. The dominant symptom complex in our patients, postprandial fullness (79.0%) and early satiety (67.7%) with frequent epigastric burning (40.0%) and episodic pain (30.0%), is consistent with dyspepsia clinics worldwide. In our data, several symptoms showed statistical association with *H. pylori* positivity: postprandial fullness ($p = 0.017$), early satiety ($p = 0.012$), and epigastric burning ($p = 0.008$) were each more common among positives, while epigastric pain trended but did not reach significance ($p = 0.079$). Although these within-sample associations are interesting, authoritative guidelines emphasize that individual dyspeptic symptoms are poor predictors of infection status and should not be used to select patients for testing or to infer eradication success. The 2024 American College of Gastroenterology guideline underscores that a “test-and-treat” strategy for *H. pylori* in uninvestigated dyspepsia is appropriate in high-prevalence settings, independent of the exact symptom constellation, and that proof of eradication requires a validated test rather than symptom resolution (Chey et al. 2024).^[12] Our findings, therefore, complement rather than contradict the consensus: symptoms may differ in frequency among positives within a given clinic, but they cannot substitute for diagnostic testing.

Alarm features in our series were infrequent, as expected in a dyspepsia cohort rather than a bleeding/weight-loss clinic. This is clinically reassuring and consistent with the ACG perspective that alarm features (e.g., overt GI bleeding, significant weight loss, progressive dysphagia, severe anemia) should trigger prompt endoscopic evaluation rather than modify *H. pylori* testing per se. The very low prevalence of such features in our patients supports the appropriateness of the diagnostic pathway we followed (non-invasive or minimally invasive *H. pylori* testing plus selective endoscopy) (Chey et al. 2024).^[12] In our study,

Helicobacter pylori infection was diagnosed using a combination of rapid urease test (RUT), serum IgG, stool antigen test, and biopsy histology. Among the 300 dyspeptic patients, RUT detected the largest number of positives (119 cases), followed by IgG serology (57 cases), stool antigen (24 cases), and histology (14 cases). The overall detection rate across all modalities was 71.7%. This pattern reflects both the diagnostic performance of each test and the sequence in which they are utilized in our clinical setting.

RUT emerged as the most productive single modality, which is consistent with several regional studies. Bhatia et al,^[13] (2011) reported RUT positivity of 64% in Indian dyspeptic patients, which was higher than both histology and serology in their series. Maleki et al,^[14] (2013) similarly observed that RUT had a sensitivity of over 90% when adequate biopsy sampling from both the antrum and corpus was performed, underscoring the role of proper sampling technique in maximizing yield. Gulati et al,^[15] (2013) from New Delhi reported that RUT positivity was 61.4%, higher than histology (54.8%) and culture (38.6%), concluding that RUT remains the most cost-effective invasive test in high-prevalence settings. Histology provided the lowest detection rate in our series, largely because it was not performed universally and biopsy site/number were inconsistent. Nevertheless, histology remains valuable for both diagnosis and evaluation of associated mucosal pathology. Maleki et al,^[14] (2013) emphasized that histologic detection is influenced by sampling location, the number of biopsies, and the presence of atrophic changes, which may lower yield in chronic infections.

Our findings support the concept that combining multiple diagnostic modalities increases the detection rate compared to using a single test. Similar conclusions were drawn by Aftab et al,^[16] (2014) who found that a combination of RUT and histology achieved the highest diagnostic accuracy in dyspeptic patients. This multi modal approach is particularly relevant in tertiary care settings, where invasive testing is already being performed, and where maximizing diagnostic accuracy is critical for targeted treatment. Among the 215 *H. pylori*–positive patients in our cohort, antral gastritis was the most frequent endoscopic finding (39.1%), followed by peptic ulcer disease (5.6%), erosive pangastritis (4.2%), and a small fraction (3.7%) with normal-appearing mucosa. The predominance of antral gastritis aligns with patterns reported in several South Asian studies. In a North Indian series by Singh et al,^[17] (2015) antral gastritis accounted for over 60% of positive cases, with pangastritis and duodenal ulcers comprising smaller proportions.

The relatively modest prevalence of peptic ulcer disease in our study is noteworthy. In a Kathmandu-based cohort, Shrestha et al,^[18] (2014) observed a declining incidence of duodenal ulcer among *H. pylori*–positive dyspeptics, attributing this to increased use of proton pump inhibitors and earlier

initiation of eradication therapy. Our findings are consistent with this trend, suggesting that ulcer disease may be less common despite persistent high infection rates. The presence of normal-appearing mucosa in a minority of positive cases is also well documented. Taken together, our endoscopic findings affirm that antral gastritis is the dominant presentation of *H. pylori* in symptomatic patients in our setting, but that absence of overt endoscopic lesions does not rule out infection. Therefore, reliance solely on gross mucosal appearance would risk underdiagnosis, emphasizing the continued need for histologic or rapid urease testing in appropriate clinical contexts.

CONCLUSION

This study demonstrates that *H. pylori* infection is highly prevalent (71.7%) among dyspeptic patients in the Kumaon region of Uttarakhand. The infection affects both rural and urban populations, with a slight male predominance and highest prevalence among middle-aged adults. Low educational attainment and lower-middle socio-economic status emerged as common background characteristics, underlining the need for targeted health education and preventive strategies. Clinically, postprandial fullness, early satiety, and epigastric burning were significantly associated with *H. pylori* infection, while epigastric pain alone was not a reliable predictor. Endoscopically, antral gastritis was the most frequent abnormality.

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