



Correspondence

Prevalence of *Helicobacter pylori* infection & pattern of gastrointestinal involvement in patients undergoing upper gastrointestinal endoscopy in Sikkim

Sir,

Helicobacter pylori infection of stomach induces chronic inflammation¹. Production of ammonia by this urease-producing bacteria and release of biochemicals such as proteases, vacuolating cytotoxin A and phospholipases contribute significantly to its inflammatory and carcinogenic potential². Inflammation induced due to these bacteria causes duodenal ulcer, gastric ulcer as well as cancers³. Mode of transmission of *H. pylori* is the faecal-oral or oro-oral route⁴. Around 50 per cent of world's population harbours this pathogen in upper gastrointestinal (GI) tract⁵, but the prevalence of this infection varies worldwide, being as low as 10 per cent in developed Western nations to as high as 80 per cent in developing countries including India^{6,7}. Clinical manifestations occur only in approximately 20 per cent^{8,9}.

Of various tests to diagnose this infection, rapid urease test (RUT) is rapid, inexpensive and widely available method. Commercial RUTs have specificities above 95-100 per cent and sensitivity is 85-95 per cent. Endoscopy with RUT and brush cytology is considered gold standard for diagnosis. The sensitivity and specificity of histology ranges from 53 to 90 per cent. Non-invasive tests include urea breath test (UBT), serology and stool antigen test (SAT). Sensitivity and specificity of UBT exceed 90 per cent¹⁰ and this test can be considered being the gold standard test amongst the non-invasive tests.

Sikkim is a north eastern and least populated State of India. More than 20 varieties of ethnic-fermented food including smoked meat and fish, and more than 10 types of fermented beverages are consumed in Sikkim¹¹. *H. pylori* infection and other environmental factors have emerged as significant dietary risk factors for gastric cancer^{12,13} which is reported to be very

high in Sikkim¹⁴. This study was done to estimate the prevalence of *H. pylori* infection and the pattern of GI involvement in patients undergoing upper GI endoscopy in a tertiary care hospital in Sikkim, India.

A retrospective observational study was conducted in Central Referral Hospital, Sikkim Manipal Institute of Medical Sciences (CRH-SMIMS), Gangtok, Sikkim, in patients subjected to upper GI endoscopy during a period of two years (January 2012 to January 2014) after getting approval from the Institutional Ethical Committee. Consecutive patients >12 yr of age, presenting with dyspepsia or symptoms such as melena, weight loss and anaemia after obtaining informed written consent were included in the study. Patients previously treated for *H. pylori* infection or who gave a clear history of using proton-pump inhibitors or antibiotics within the past four weeks of endoscopy or refused consent were excluded. Since CRH-SMIMS is the only tertiary care and medical college hospital in this remote north-eastern region of India, it caters to all the four districts of Sikkim.

The patients were screened and those with positive *H. pylori* infection were analyzed in detail. Endoscopy was performed. *H. pylori* infection was considered positive if it was positive in biopsied sample by RUT or histopathological examination with Giemsa staining or both. RUT was performed in one antral biopsy specimen by commercially available agar-based Pylo dry kit (Halifax Research Laboratories, Kolkata). Patients found to have active bleeding in endoscopy were considered for histopathological examination as well to rule out false-negative results. Histopathological examination was requested in some selected cases such as suspected malignancies and gastric ulcers. In those cases, two additional biopsy specimens from antrum and greater curvature of corpus were taken to enhance diagnostic yield¹⁵. Multiple biopsies from the

growth and margin of the ulcer were taken to arrive at a histopathological diagnosis. The biopsy specimens were fixed overnight in 10 per cent buffered formalin, processed, embedded in paraffin and cut and stained with haematoxylin and eosin and Giemsa stain¹⁶. The endoscopic diagnoses were categorized into gastritis, duodenitis, oesophagitis/gastro-oesophageal reflux disease (GERD), erosions, peptic ulcer disease (duodenal ulcer and gastric ulcer), non-ulcer dyspepsia (NUD) and growth/neoplasm. All kinds of gastritis were combined into one. If two or more diagnoses were present in a patient, the severest form of disease was considered.

Descriptive and frequency analysis of the data from the study was expressed as counts, percentage and means or medians as appropriate to provide the overall picture. The data were analyzed using Statistical Package for the Social Sciences version 14 (SPSS Inc., Chicago, IL, USA) for windows. Chi-square test with Fisher's exact test was used where applicable.

Medical records of 1539 consecutive patients (840 males and 699 females) were screened. RUT was done in all patients, whereas histopathological examination was done only in 48 patients with gastric ulcers (23 patients), bleeding duodenal ulcers (5 patients) and growth in stomach and oesophagus (20 patients). Four hundred and fourteen patients were found to be positive for *H. pylori* infection (395 patients by RUT alone and 19 by RUT/ histology or both). Of the 19 patients, positivity alone by RUT was observed in 12 patients and four with histopathological examination. In three patients, infection was positive both by RUT and histopathological examination. Overall prevalence was 27 per cent [95% confidence interval (CI):

0.2471-0.292]. Of the 414 *H. pylori*-positive patients, 259 (63%) were males and 155 (27%) were females. Prevalence in males was higher (31%) as compared to females (22%) and the difference was significant ($P=0.001$, odds ratio: 1.56, 95% CI: 1.242-1.971). Age ranged from 13 to 90 yr (mean - 51.5 ± 22.66). Most common presentation was dyspepsia (74%), melena (16%), vomiting (7%) and weight loss (3%). The endoscopic findings were categorized into gastritis, duodenitis, oesophagitis/GERD, peptic ulcer disease (gastric and duodenal ulcer), erosions, NUD, gastric and oesophageal growth (Table). Of the 168 patients with gastritis, 118 (70%) had antral predominant gastritis and 50 (30%) had either fundal, corpus or pangastritis. *H. pylori* infection was significantly associated with gastritis, GERD/oesophagitis, peptic ulcer, duodenitis, NUD, gastric and duodenal ulcer, but not with malignancy (Table).

The reported prevalence of *H. pylori* infection from various Indian centres in patients with duodenal ulcer, gastric ulcer, gastric cancer and NUD ranges from 64 to 90 per cent, 50-65 per cent, 38-62 per cent and 42-74 per cent, respectively¹⁷. In our study, it was 61.5 per cent (for duodenal and gastric ulcer, 30 and 10%, respectively). Gastritis was the most common endoscopic finding similar to that found in south India¹⁸. An association between *H. pylori* infection and gastritis was seen which was similar to most^{18,19} and contrary to other studies²⁰. The present study showed a higher prevalence of antral gastritis as compared to fundal, corpus or pangastritis. There is a strong association between *H. pylori* infection and gastric cancer¹⁴. Southern and eastern parts of India have a higher frequency of gastric cancer than that in northern parts^{21,22}. As per the report by the Population-based

Table. Relationship between upper gastrointestinal lesions and *Helicobacter pylori* infection in studied population

Endoscopic findings	n=1539	<i>H. pylori</i> positive (n=414)	<i>H. pylori</i> negative (n=1125)	Prevalence (%)	P	OR (95% CI)
Gastritis	786	168	618	21.30	<0.001	0.56 (0.45-0.70)
GERD/oesophagitis	177	76	101	42.93	<0.001	2.27 (1.65-3.15)
Peptic ulcer	91	56	35	61.50	<0.001	4.87 (3.14-7.56)
Duodenal ulcer	68	47	21	69	<0.001	6.73 (3.97-11.41)
Gastric ulcer	23	9	14	39	0.234	1.76 (0.75-4.10)
Duodenitis	138	55	83	39.85	<0.001	1.90 (1.32-2.73)
Erosions	64	26	38	40.60	0.01	1.92 (1.15-3.19)
NUD	263	27	236	10.00	<0.001	0.26 (0.17-0.39)
Growth/malignancy	20	6 (Cancer stomach)	14	30.00	0.75	1.17 (0.45-3.06)

GERD, gastro-oesophageal reflux disease; NUD, non-ulcer dyspepsia; CI, confidence interval; OR, odds ratio

Cancer Registries in India (2006-2008), stomach cancer was the first amongst the five leading cancers in males and the third most common cancer amongst females in Sikkim¹⁴. We found insignificant association between *H. pylori* infection and gastric cancer as reported earlier²³. In our study, we found higher prevalence of *H. pylori* infection in males as compared to females. Studies conducted in Georgia, Iran²⁴ and Kerala¹⁸ have shown almost equal prevalence in males and females. Our result was similar to a study conducted in central India which showed a higher prevalence in males²⁵.

Overall, this study showed *H. pylori* infection in 27 per cent patients undergoing GI endoscopy in Sikkim and the association with gastric malignancies was found to be insignificant. Low prevalence of this infection could be due to many factors such as study being merely a hospital based, selection of patients for upper GI endoscopy, and technical issues related to RUT and histology, leading to underdiagnosis. Histological examination was done in selected cases only. Various other methods such as UBTs, serology, and SAT should be applied concomitantly to enhance diagnostic yield which could not be done in our study due to cost constraint or non-availability. Furthermore, low prevalence in a hospital-based study suggests much lower prevalence in the community in view of its biased nature.

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Conflicts of Interest: None.

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