Prevalence of active *Helicobacter pylori* infection among patients referred for endoscopy in Brunei Darussalam

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ABSTRACT

Introduction: The prevalence of *Helicobacter pylori (H. pylori)* infection has been reported to vary between and even within countries. We retrospectively assessed the prevalence among patients referred for endoscopy in our local setting.

Methods: 4,700 patients, who had endoscopy and *H. pylori* testing for the first time over a five-year period, were reviewed.

Results: The mean age was 45.4 +/- 17.1 years (male 51.1 percent), with racial breakdown similar to the national breakdown. The main indications for endoscopy were dyspepsia (59.6 percent), anaemia (12.6 percent), gastrointestinal bleeding (9.4 percent) and gastro-oesophageal reflux (7.6 percent). The overall prevalence of *H. pylori* was 26.9 percent, highest in the 30-39 years (30.3 percent) age group. This was higher in males compared to females (30.3 percent versus 23.3 percent, p-value is less than 0.001). Among the racial groups, the expatriate (35.3 percent, p-values are less than 0.001) and the indigenous (31.3 percent, p-values are less than 0.001) groups had significantly higher prevalence rates compared to the Malays (25.9 percent) and the Chinese (23.2 percent). Patients with dyspepsia had the highest prevalence (29.8 percent) compared to the other indications. In patients with peptic ulcer disease, the prevalence rate was 46.9 percent. Over the five-year period, there was a decline in prevalence from 32.3 percent to 25.6 percent. This trend was seen in the Malays and the Chinese, but not the indigenous and the expatriate groups.

Conclusion: Similar to reported data from the regions, prevalence of *H. pylori* infection varies, with the Malays and the Chinese having the lowest prevalence rate. The prevalence among those with peptic ulcer disease was lower than reported. There was also a decline in the overall prevalence.

Keywords: dyspepsia, endoscopy, *Helicobacter pylori*, peptic ulcer

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INTRODUCTION

Helicobacter pylori (*H. pylori*) infection is a common infection with an estimated half of the world's adult population having been exposed to this organism.[1] It is an important aetiological factor in the development of peptic ulcer disease, gastric adenocarcinomas and gastric mucosa-associated lymphoid tissue (MALT) lymphomas.[2-5] As a result, the World Health Organisation has classified *H. pylori* as a Class 1 carcinogen. Recent reports indicated a decreasing prevalence.[6-7] The prevalence of *H. pylori* is known to vary widely between different countries and even between different racial groups within a country.[8-11] The prevalence rates are higher in developing nations, particularly in those with lower socio-economic status.[12-15]

Data from Singapore and Malaysia show that the Malays and the Chinese had the lowest prevalence rates compares the Indians.[11-16] Brunei Darussalam is a developing nation with a multi-racial population that comprises Malay, Chinese, indigenous and expatriate groups. The expatriate group includes mainly those from the neighbouring Southeast Asian nations and the Indian subcontinents. This study retrospectively assessed the prevalence of active *H. pylori* infection among patients referred for endoscopy.

METHODS

The Endoscopy Unit of Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital is the largest referral centre for endoscopical work in our local setting. It has a population catchment of 275,000, which covers three of the four districts in the country. The fourth district has its own smaller endoscopy unit. Patients presenting for endoscopy for various complaints routinely have their *H. pylori* status

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checked, regardless of the indications, by means of a rapid urease test (*CLOTest*®, Delta West Ltd, Bentley, West Australia), histology or combinations. This practice has been followed since the latter part of the nineties. There are no other modalities available for testing *H. pylori* in our institution.

From January 2000 to December 2004, all patients referred for upper gastrointestinal endoscopy and had *H. pylori* testing for the first time, were identified from the endoscopic registry and included in the study. During this period, 7,757 upper gastrointestinal endoscopies were performed, of which 3,057 procedures were excluded for various reasons. These included the 1,345 that had no *H. pylori* testings, 1,623 that were not first-time endoscopic procedures and the 87 that had incomplete data, leaving 4,700 cases for the study. All patients who tested positive for *H. pylori* were given eradication therapies. The modality available in our centre for assessing eradication is a repeat endoscopy usually eight to ten weeks after eradication therapy with biopsy for either rapid urease test or histology examination. This accounted for the high number of patients having repeat endoscopy in our local setting. Patients' demographical and endoscopic data were retrospectively retrieved and entered into the SPSS version 10.0 (Statistical Package for Social Sciences, Chicago, IL, USA) package for evaluations. The chi-square test was used to compare the differences of *H. pylori* prevalence between the different age, genders and racial groups. Level of significance is taken when $p < 0.05$.

RESULTS

The mean age of patients presenting for endoscopy was 45.4 ± 17.1 years (male 51.1%) with a racial breakdown similar to the national breakdown: Malay (72.8%), Chinese (12.7%), indigenous (3.5%) and expatriate (11.0%). The indications and findings of the endoscopies are shown in Table I. The overall prevalence of active *H. pylori* infection was 26.9%, highest in the 30–39 years age group, followed by the 50–59 years age group. Prevalence was significantly higher in the 20–29, 30–39, 40–49 and 50–59 years age groups, compared to the < 20, 60–69 and ≥ 70 years age groups (all p-values < 0.05) (Table II). It was also noted that male patients had significantly higher prevalence compared to their female counterpart (30.3% vs. 23.3%, $p < 0.001$), particularly in the 20–29, 40–49, 50–59 and ≥ 70 years age groups. The highest prevalence in the male group was seen in the 20–29 and 30–39 years age groups. In the female group, this was seen in the 50–59 years group (Table II).

The prevalence among the various racial groups is shown in Table III. The prevalence was highest among the indigenous group ($p < 0.001$ compared to the Malays and the Chinese) and the expatriate group ($p < 0.001$ compared to the Malays and the Chinese). Among the expatriates, prevalence was highest among those from the Indian subcontinent, particularly the Nepalese (44.1% compared to the Caucasians and Southeast Asians, all p-values < 0.05). Among the various indications for endoscopy, patients with dyspepsia had the highest prevalence of *H. pylori* infection (29.8%) compared to those with anaemia (17.6%), gastrointestinal bleed (22.3%), acid reflux disorders (24.0%), loss of weight/loss of appetite (21.3%), vomiting (23.8%) and dysphagia/odynophagia (27.7%). The prevalence among those with peptic ulcer disease (PUD) was 46.9%. The breakdown prevalence was gastric ulcer (GU, 31.9%), duodenal ulcer (DU, 49.8%) and GU/DU (43.6%). Over the five-year period, there was a decline in the overall prevalence of *H. pylori* infection (Fig. 1). This trend was seen among the Malays (31.4% to 24.1%) and the Chinese (31.9% to 17.1%). However, the overall

Table I. Indications and findings of endoscopy.

	No. (%)
Indications	
Dyspepsia	2,801 (59.6)
Evaluation of anaemia	592 (12.6)
Gastrointestinal bleeding	447 (9.5)
Acid reflux disorders	357 (7.6)
Loss of appetite/weight	113 (2.4)
Vomiting	103 (2.2)
Dysphagia/odynophagia	80 (1.7)
Others	207 (4.4)
Total	4,700 (100)
Findings	
Normal	1,324 (28.2)
Hiatus hernia	1,010 (21.5)
Gastritis/duodenitis	2,566 (54.6)
Oesophagitis	1,050 (22.3)
Mild	1,004 (21.4)
Moderate/severe	46 (1.0)
Peptic ulcer disease	706 (15.0)
Gastric ulcer	216 (4.6)
Duodenal ulcer	412 (8.8)
Gastric & duodenal ulcers	78 (1.7)
Carcinoma	18 (0.4)
Oesophageal	3 (0.1)
Stomach	15 (0.3)
Portal hypertension-related	30 (0.6)

Oesophagitis: Mild, based on Los Angeles (LA) Classification Grade A and B; Moderate and Severe, based on LA Classification Grade C and D.

Table II. Prevalence of *Helicobacter pylori* among the different age groups and different gender age groups.

Age groups (years)	Male, no. (%)	Female, no. (%)	Overall, no. (%)
< 20	24/111 (21.6)	28/136 (20.6)	52/247 (21.1)
20–29	100/278 (36.0)*	71/335 (21.2)	171/613 (27.9)‡
30–39	158/480 (32.9)	117/429 (27.3)	275/909 (30.3)‡
40–49	194/623 (31.1)*	137/590 (23.2)	331/1,213 (27.3)‡
50–59	118/360 (32.8)*	92/355 (25.9)	210/715 (29.4)‡
60–69	64/289 (22.1)	55/241 (22.8)	119/530 (22.5)
≥ 70	70/263 (26.6)*	35/210 (16.7)	105/473 (22.2)
Total	728/2,404 (30.3)	535/2,296 (23.3)	1,263/4,700 (26.9)

‡ significantly more than age groups < 20, 60–69 and ≥ 70 (all $p < 0.05$);
* $p < 0.05$ compared to the female group

Table III. Prevalence of *Helicobacter pylori* among the various ethnic groups.

Ethnic background	No. (%)
Malays	870/3,353 (25.9)
Chinese	141/609 (23.2)
Indigenous	65/208 (31.3)*
Expatriates	187/530 (35.3)*
Nepalese	108/245 (44.1)‡
Caucasians	8/48 (16.7)
Indians (subcontinent)	45/122 (36.9)‡
Southeast Asians	26/115 (22.6)
Total	1,263/4,700 (26.9)

* $p < 0.001$ compared to the Malays and the Chinese;
‡ $p < 0.05$ compared to Caucasians and Southeast Asian.

prevalence was stable among the expatriates (34.9% to 42.3%) and increasing among the indigenous group (32.1% to 44.8%) (Fig. 2), and this trend was not seen among those with PUD (Fig. 3).

DISCUSSION

Our study showed an overall prevalence of active *H. pylori* infection of 26.9% among patients referred for endoscopies in our local setting. The prevalence rates ranged from 23.2% to 44.1% among the various racial groups. It was highest among the expatriates and lowest among the Malays and the Chinese. This is comparable to the prevalence rates reported in neighbouring countries. In Malaysia, this ranged from 26.4% to 55.0%, and in Singapore, this ranged from 13.7% to 34.3%.[16-18] Both the Malays and the Chinese had the lowest prevalence whereas the Indians had the highest rates.[16-18] The high prevalence in our expatriate group may be a reflection of the prevalence rates of their countries of origin, as the majority come from developing countries. Apart from the Nepalese, the majority of the expatriates were labourers and had higher risk lifestyles such as lower standards of living and communal-living environments. The Nepalese are part of the British Gurkas army reserve stationed in the country, with a majority living in army barracks.

The prevalence of active *H. pylori* infection was high between the range of 20 and 59 years, particularly in the 30–39 years age group. Between the genders, the male group had significantly higher prevalence, particularly in the 20–29, 40–49, 50–59 and ≥ 70 years age groups. The exact reasons for these observed differences are not completely known. Factors such as improved standard of living and hygienic practices may account for the lower prevalence.[8] However, this will require further studies to assess if there is an association. Despite this, there are also studies that have not found any gender differences.[19,20]

Among the various indications for endoscopy, patients with dyspepsia had the highest prevalence. However, this was only 30%, suggesting that other non-*H. pylori* related aetiologies are important causes of dyspepsia. Similarly, the prevalence of *H. pylori* among our patients with PUD was lower than reported. This is lowest in those with GU. We were not able to assess the associations between nonsteroidal anti-inflammatory drug (NSAID) or anti-platelet use and non-*H. pylori* PUD, as information on their use were not routinely recorded in the endoscopic notes. However, a detailed review of bleeding ulcers requiring endoscopical haemostasis encountered in 2004 in our local setting showed that 50% of non-*H. pylori* ulcers had history of NSAID or anti-platelet use. A recent study showed that among those patients with *H. pylori* negative PUD, a high prevalence of occult NSAID usage was detected based on elevated serum thromboxane.[21] This supports the belief that a significant proportion of patients with non-*H. pylori* PUD probably had occult NSAID usage.

Several studies have reported declining prevalence of *H. pylori* infections over the last decade.[6,7] Despite a shorter period of five years in our study, there was a decline in the overall prevalence of active *H. pylori* infection. This trend was seen among the Malays and the Chinese, but not

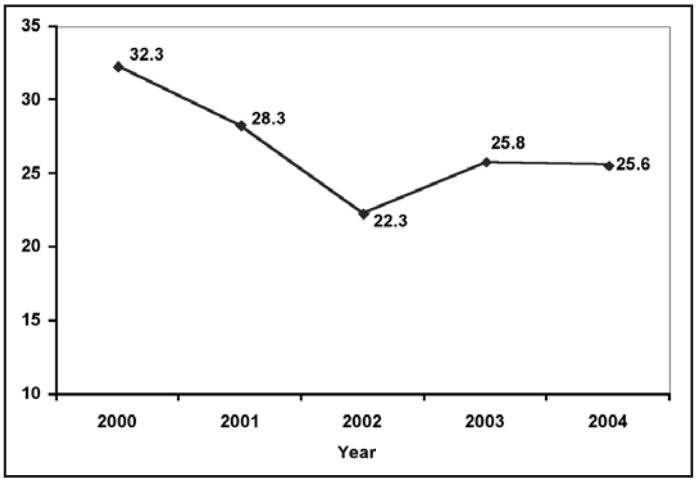

Fig. 1 Graph shows the overall prevalence of *Helicobacter pylori* over five years.

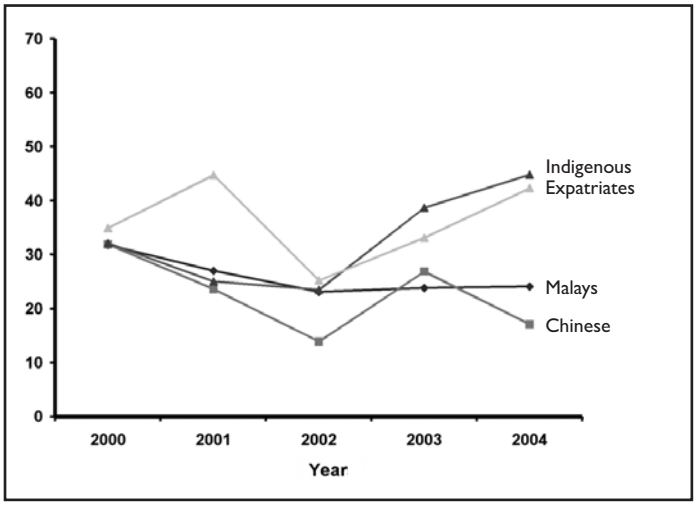

Fig. 2 Graph shows the prevalence of *Helicobacter pylori* among the racial groups over five years.

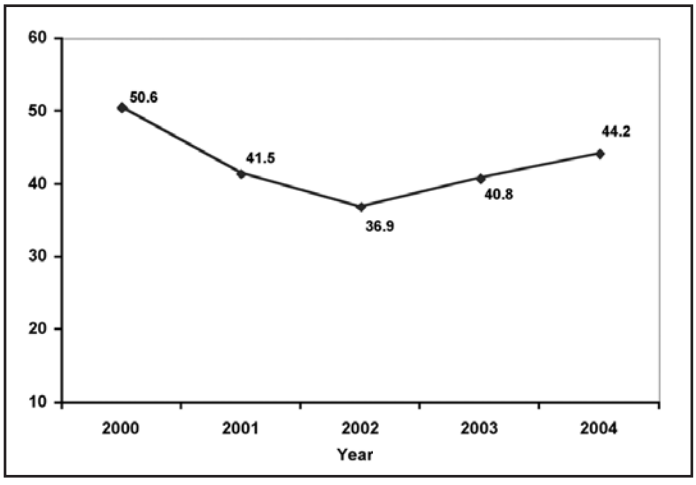

Fig. 3 Graph shows the prevalence of *Helicobacter pylori* in patients with peptic ulcer disease.

among the expatriate and the indigenous groups. The trend seen among the expatriates is not unexpected as there is continuous movement among this group. We are not able to explain the trend seen within the indigenous group, but the smaller sample size of this group may account for this. Similarly, the lower prevalence seen in the year 2002 may be due to the natural fluctuation in the trend. The same reason may account for the trend seen among patients with PUD. A longer study period may show more definitive trends.

There are several limitations with our study. Firstly, the retrospective nature of the study is inherently associated with limitations. Secondly, our endoscopic data sheet was not designed to capture data on education, monthly income and household size. Hence, we were not able to assess the associations of these variables with *H. pylori* prevalence. However, despite this, the findings of our study are consistent with published findings. Importantly, our prevalence rates are that of active infections and compared to most studies based on serology for detection of *H. pylori* infection. A positive serology test does not differentiate between active or previous infection.

In conclusion, our study showed that prevalence of active *H. pylori* infections varies among the different racial groups residing in Brunei Darussalam. *H. pylori* infections are common, particularly in the indigenous and expatriate groups. Consistent with reports from the neighbouring countries, both the Malays and the Chinese had lower prevalence rates. Despite a shorter study period of five years, there was a decline in the overall prevalence of *H. pylori* infection, and this was notable among the Malays and the Chinese. The prevalence of *H. pylori* among those with PUD is lower than previously reported.

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