



**PREVALENCE AND ETHNIC DISTRIBUTION OF
HELICOBACTER PYLORI INFECTION AMONG
ENDOSCOPED PATIENTS IN NORTH EASTERN
PENINSULAR MALAYSIA**



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Prevalence and ethnic distribution of *Helicobacter pylori* infection among endoscoped patients in North Eastern Peninsular Malaysia

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SUMMARY

The prevalence and ethnic distribution of *Helicobacter pylori* infection as diagnosed by histological evaluation of gastric biopsies was determined among 400 endoscoped patients in the North Eastern Peninsular Malaysia. The results show an unusually low prevalence of *H. pylori* infection of 13.5%. Within the multiracial country of Malaysia, there exists consistent and significant difference in prevalence of this infection between the Malay and non-Malay races with the highest prevalence in Indians (28.6%) followed by Chinese (24.1%) and exceptionally low in the Malays (6.6%). Genetic and socio-cultural differences are deemed the most likely reasons for this interesting pattern of racial distribution.

ABSTRACT

Background: There exists significant difference in prevalence of *H. pylori* infection among different societies and ethnic groups, even within the same country. Malaysia with its multiracial population provided a valuable opportunity to study the racial distribution of this infection. **Objectives:** The aim of this study was to determine the prevalence and ethnic distribution of *Helicobacter pylori* infection in an endoscoped population in the North Eastern Peninsular Malaysia. **Methods:** Pathology records of 400 consecutive gastric biopsies received at the pathology laboratory in a university hospital were reviewed. Demographic data of patients including their ethnic groups were documented. *H. pylori* infection was ascertained by histological evaluation of the gastric biopsies. Univariate and multivariate analysis were applied to determine the prevalence of *H. pylori* infection in the sampled population and the difference in prevalence among the ethnic groups. **Results:** The overall *H. pylori* infection prevalence rate was unusually low at 13.5% (54 of 400) in this region. The prevalence among the races were as follows: Malay 6.6% (17/256), Chinese 24.1% (27/112) and Indian 28.6% (6/21). Gender and age were not significant risk factors for *H. pylori* infection. However there was an increased risk of *H. pylori* infection in Chinese (OR= 4.46, 2.3-8.6) and Indians (OR=5.6,1.9-16.3) compared to Malays. **Conclusion:** The difference in prevalence of *H. pylori* infection between the three major ethnic groups concurs with other studies done in Malaysia. The reason for this interesting finding is uncertain and is suspected to be due to different environmental, genetic and socio-cultural practices in the various races.

INTRODUCTION

Helicobacter pylori infection has a worldwide distribution and there is great difference in its prevalence among different societies and ethnic groups, even within the same country. Malaysia is a multiracial country, composed of three main ethnic groups, namely Malay, Indian and Chinese. The different races although living together, have exclusive habits and cultural practices peculiar to its own. This made it appealing to study the prevalence of *H. pylori* infection and its distribution among the various ethnic groups in this country. Studies in this region have shown a considerable difference in the prevalence of *H. pylori* infection in the different races (1-5). We sought to determine if this was also true among endoscoped patients in a university hospital in the North Eastern Peninsular Malaysia, an area with majority of its population of Malay ethnicity. It is hoped that this would present valuable insights into the epidemiology of the disease and possible routes of *H. pylori* transmission.

METHODS

Pathology records of 400 consecutive gastric biopsies received at the pathology laboratory in Universiti Sains Malaysia were reviewed. Demographic data of patients including their ethnic groups were documented. The presence or absence of *H. pylori* in gastric biopsies was noted. Histological gastritis was deemed as present or absent. Other histological variables were not looked into. When a subject was endoscoped repeatedly, it was regarded as a single case and *H. pylori* status was regarded as positive if any of the biopsies demonstrated the organism.

Statistical analysis

Univariate and multivariate analyses were applied to determine the prevalence of *H. pylori* infection in the sampled population, the difference in prevalence among the ethnic groups and factors influencing *H. pylori* infection. Chi-square and independent t tests were applied in univariate analysis. Multiple logistic regression was used to determine influencing factors for this infection. Adjusted odds ratio with 95% confidence interval and its corresponding p-value were applied.

RESULTS

A total of 400 pathology reports of endoscoped subjects were studied, of whom 265 were male (male: female ratio 2.3:1). The mean age was 54.4 years with a range of 2 years to 97 years. The ethnic composition of the group was as follows: Malay 256 (64% of subjects); Chinese 112 (28%); Indian 21 (5.2%) and 'other races' 11(2.8%). The 'other races' category composed of ten Thais and one Caucasian.

The overall prevalence of *Helicobacter pylori* infection among endoscoped patients was 13.5% (54/400). The prevalence among the races were as follows: Malay 6.6% (17/256); Chinese 24.1% (27/112); Indian 28.6% (6/21); Others 36.4% (4/11). The Caucasian was negative for *H. pylori*.

Using univariate analysis, there was no significant difference in gender and mean age between *H. pylori* positive and negative subjects (table 1). However there was significant difference of *H. pylori* infection among the various ethnic groups and this was further substantiated with multivariate analysis (table 2). Chinese had 4.5 times higher odds of being infected with *H. pylori* (OR 4.46, 95% CI 2.32-8.60) while Indians had about 5.5 times (OR 5.67, 95% CI 1.93-16.34) and 'other races' about 8 times (OR 8.03, 95% CI 2.14-30.16) higher odds of being infected.

The overall prevalence of gastritis was 62% (248/400). Twenty two percent of patients with gastritis were positive for *H. pylori*. All *H. pylori* infected subjects had evidence of histological gastritis.

Table 1

Variable	<i>H. pylori</i> status	Test statistic	p value
Sex			
Male	*37 (35.8%)	0.144	# 0.705
Female	17 (18.2%)		
Age			
<i>H. pylori</i> present	** 56.19 ± 17.67	-0.794	## 0.427
<i>H. pylori</i> absent	54.17 ± 17.31		
Race			
Malay	* 17 (34.6%)	28.65	# < 0.001
Non Malay	37 (19.4%)		

Univariate analysis of *Helicobacter pylori* infection

* *Helicobacter pylori* status

** Mean age and standard deviation

Pearson Chi-square test

Independent t test

Table 2

Variable	*Adjusted odds ratio	95% CI	P value
Race			
Malay	1	-	-
Chinese	4.46	2.32 - 8.60	< 0.001
Indian	5.62	1.93 -16.34	0.002
Others	8.03	2.14 - 30.16	0.002

Multivariate analysis of *Helicobacter pylori* infection among different races

* Multiple logistic regression method

DISCUSSION

Epidemiological studies have documented great differences in the prevalence of *Helicobacter pylori* infection in different populations and ethnic groups. This variability is likely to be related to differences in environmental, bacterial and host factors.

Seroepidemiological studies and endoscopic surveys in Malaysia and Singapore report an overall high prevalence rate of *H. pylori* infection between 26-60% (1-5). In contrast North Eastern Peninsular Malaysia has an unusually low prevalence rate of about 5% in the general population and 13-15% among endoscoped dyspeptic patients (6,7).

Patterns and distribution of *H. pylori* infection among different ethnic groups living in the same country is interesting and may provide valuable insights into the possible modes of transmission of the organism. There are three major races in Malaysia and Singapore namely Malays, Chinese and Indians. Various studies done in both countries have consistently shown a higher prevalence of *H. pylori* infection among non-Malays compared to Malays (1-6). A 49% prevalence of *H. pylori* infection was recorded among dyspeptic Malaysians in an urban area in the west coast of the peninsula, with prevalence of 16.4% in the Malays, 48.5% in Chinese and 61.8% in Indians (1). Our study conducted in North Eastern Peninsular Malaysia showed an overall *H. pylori* infection prevalence rate of 13.5% with the highest prevalence among Indians (28.6%) followed by Chinese (24.1%) and Malay 6.6%. The low overall prevalence validates a previous study done in the same population (6). This is attributed to the predominantly Malay population of this North Eastern state. The similar difference in prevalence among the various ethnic groups is reflected in asymptomatic Malaysian children (3). In our study it was interesting to

note that the Thai patients had a much higher prevalence of 40% notwithstanding the small number of patients in this group.

The reason for racial differences in *H. pylori* infection rates is unclear. Transmissibility of *H. pylori* is still debatable but generally, oral-oral and oral-fecal routes are thought to be the main modes of spread. Most infections are acquired in childhood (8,9). The increased risk of infection in Indians, Chinese and Thais may be due to different socio-cultural practices peculiar to each race. Communal eating habits allow close personal contact and this is practiced in many Asian communities. Religious rituals and diet are among other factors that should be studied. Another strong plausible explanation to the wide difference in infection rates among the races is the inherent genetic predisposition that plays a role in host-bacteria interaction. This needs to be investigated.

Low socioeconomic status associated with high-density living and inferior hygienic conditions is thought to play a major role in transmission of the organism (8,9). The socioeconomic status was not detailed in our study though it is generally considered that the population in this North Eastern region is poorer and more rural compared to the west coast of the peninsula. Though urbanization and overcrowding may contribute to transmission and perpetuation of *H. pylori* infection, it would be thought that it be reflected uniformly throughout the races. However this is not the picture as the racial differences in infection rates are seen both in the urban and rural areas.

Gender and age did not prove to be significant risk factors for *H. pylori* infection in our study, in contrast to another study that showed these variables as independent risk factors

(1)

Study of gastric biopsies showed that only 22% of endoscoped patients with histological gastritis were positive for *H. pylori*. This reflects a relatively poor association between histological gastritis and *H. pylori* infection. Majority of the patients had chronic non-specific gastritis. However all *H. pylori*-infected subjects had evidence of histological gastritis.

In conclusion there is a significant and consistent difference in *H. pylori* infection prevalence rates among the various ethnic groups in Malaysia being highest in the Indians followed by Chinese and being unusually low in the Malays. The reasons for this is uncertain and various cultural and genetic factors need to be studied to further help understand the epidemiology and transmission of this infection.

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