

Helicobacter pylori Infection in Malaysia

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Helicobacter pylori is a gram negative microaerophilic spiral bacteria that was first identified by Warren and Marshall in 1983. It is found predominantly beneath the gastric mucus layer that lines the surface epithelium of the stomach and can colonize the gastric mucosa for years. Recent research suggests that *Helicobacter pylori* (*H. pylori*) infection is a recognised cause of gastritis and peptic ulcer disease, and more recently is implicated in gastric cancer.

The prevalence of *H. pylori* infection varies widely from population to population. Nafeeza *et al* reported that 33.9% of non-ulcer dyspepsia patients attending a gastroenterology clinic in Kuala Lumpur had *H. pylori*-associated gastritis^{1,2}. *H. pylori* infection tends to increase with age. The prevalence of *H. pylori* infection was found to be higher in patients more than 50 years of age compared to those below 30 years. The increase in *H. pylori* seropositivity with age is fairly uniform in different reported series. *H. pylori* colonization of the gastric mucosa showed no sex preponderance. Colonization of the gastric mucosa by *H. pylori* however showed an increased tendency in cigarette smokers compared to non-smokers.

Three groups of races which form major components of the Malaysian population are the Malays, Chinese and Indians, and in Kuala Lumpur the ethnic proportions are Malays 33%, Chinese 53% and Indians 14%. Race specific prevalence indicated that *H. pylori* infection rate in non-ulcer dyspepsia patients was higher in Indians (56%) followed by the Chinese (45%), and the Malays were the least affected (11.4%) (unpublished data). Differences in *H. pylori* infection amongst the above ethnic groups have also been observed by other workers^{3,4}.

Factors affecting *H. pylori* infection rate and its mode of transmission is unknown, and may be related to

childhood conditions particularly those reflecting socio-economic status, and socio-cultural and religious practices of the different races in this country.

Peptic ulcer disease is strongly associated with *H. pylori* infection which plays a pathogenic role by various mechanisms. These include its ability to secrete various enzymes including urease, proteases, lipases and phospholipases. Other pathogenic effects include the presence of adhesion pedestals, vacuolating cytotoxins and production of reactive oxygen radicals. In our own studies we found that *H. pylori* infection rate was 56% in gastric ulcer and 78% in duodenal ulcer patients. Amongst the ethnic Malays, 77% of peptic ulcerations were associated with *H. pylori* infection and *H. pylori* colonization of the gastric antrum were found in 20% of patients with dyspepsia. 53% of these patients had peptic ulcer disease and the remaining had gastritis.

A study in north-eastern peninsular Malaysia showed a low prevalence of *H. pylori* infection in the population⁵. *H. pylori* infection rate was 9% in non-ulcer dyspepsia, 5% in gastric ulcer, and 50% in duodenal ulcer patients. The low prevalence of *H. pylori* infection in non-ulcer dyspepsia patients in this report reflects the predominantly ethnic Malays involved in this study. The strikingly low infection rate with *H. pylori* in patients with peptic ulcer disease in this series is not known and may reflect differences in the sensitivity and specificity of the various tests used to detect the organism.

There is a strong suggestion that inflammation associated with *H. pylori* infection plays a role in the pathogenesis of non-cardia gastric carcinoma. *H. pylori* is strongly associated with chronic, diffuse, superficial gastritis. Over several decades, *H. pylori* gastritis may progress over to chronic atrophic gastritis, a known precursor of gastric carcinoma. Persons seropositive for

H. pylori were found to be approximately three times more likely to have gastric adenocarcinoma than control subjects.

In a review of patients with gastric carcinoma in a gastroenterology unit in Kuala Lumpur, ethnic variations were also observed⁶. There were more Chinese patients (64.9%) diagnosed to have gastric carcinoma compared to Indians (16.5%) and Malays (15.5%). *H. pylori* infection may have a role to play to explain the relatively high incidence of gastric carcinoma in Indians who comprise of only about 14% of the ethnic proportion. More studies are clearly required to obtain a clearer understanding of the association between *H. pylori* infection and gastric cancer, and role of other critical cofactors affecting risk such as dietary factors and genetic predisposition in the Malaysian population.

H. pylori gastric infection is readily diagnosed by several tests which give satisfactory results although they differ with respect to costs and invasiveness.

Endoscopic examination is usually performed in symptomatic patients in order to diagnose peptic ulcer disease, and biopsy-based tests to detect *H. pylori* infection including the rapid urease test, histology and culture of the organism can be simultaneously carried out⁷. In asymptomatic patients non-invasive tests such as the urea breath test or serologic testing is recommended.

Urea breath test (UBT) gives an overall picture of *H. pylori* colonization of the gastric mucosa as opposed to biopsy-based tests which are dependant upon the patchy distribution of *H. pylori* and gastritis. UBT detects gastric urease, produced in abundance by *H. pylori*, which breaks down a carbon isotope urea test meal. ¹³C and ¹⁴C breath tests have both been

performed and advocated by different authors. ¹³C urea breath test involves drinking a milk flavoured drink that contains ¹³C urea, a naturally occurring isotope of carbon which is non-radioactive, in contrast to ¹⁴C which carries a small inherent risk of radioactivity. The amount of ¹³C exhaled via the breath of patients is then analysed using a mass spectrometer. Urea breath test is safe and easy to perform, and leads to the detection of a current infection without the need for endoscopy^{8,9}. It is also ideal for assessing the outcome of *H. pylori* eradication therapy. At present urea breath test is however not readily available in this country.

Polymerase chain reaction (PCR) technique for detecting *H. pylori* infection is currently being developed and is not available in this country.

H. pylori-associated peptic ulcer disease requires treatment with antimicrobial agents in addition to antisecretory drugs whether on first presentation with the illness or on recurrence¹⁰. Recurrence of peptic ulcer is almost always abolished after cure of *H. pylori* infection. The value of eradication therapy for other indications such as *H. pylori* associated dyspepsia and *H. pylori* positive individuals at risk of gastric cancer, however, remains to be seen.

H. pylori infection is common amongst the three major races in Malaysia. There are ethnic differences in *H. pylori* infection rates observed amongst the three major groups which showed a higher prevalence in Indians and Chinese compared to the Malays. *H. pylori* infection in our patients is strongly associated with gastritis and peptic ulcer disease. Gastric infection with *H. pylori* is readily diagnosed by biopsy-based tests and patients with *H. pylori*-associated peptic ulcer require eradication therapy with antibiotics. Other indications for *H. pylori* eradication should be based on empirical experience.

References

1. Nafeeza MI, Shahimi MM, Kudva MV, Mazlam MZ, Isa MS. *Campylobacter pylori*, non-ulcer dyspepsia and race in Malaysia (letter). Lancet 1989;i : 1018.
2. Nafeeza MI, Shahimi MM, Kudva MV, et al. Evaluation of therapies in the treatment of *H. pylori* associated non-ulcer dyspepsia. Sing Med J 1992;33(6) : 570-4.

3. Kang JY, Wee A, Math MV, *et al.* *Helicobacter pylori* and gastritis in patients with peptic ulcer and non-ulcer dyspepsia: ethnic differences in Singapore. *Gut* 1990;31 : 850-3.
4. Goh KL, Peh SC, Wong NW, *et al.* *Compylobacter pylori* infection: experience in a multiracial population. *J Gastroenterol Hepatol* 1990;5 : 277-80.
5. Uyub AM, Raj SM, Visvanathan R, *et al.* *Helicobacter pylori* infection in North-Eastern Peninsular Malaysia. Evidence for an unusually low prevalence. *Scand J Gastroenterol* 1994;29 : 209-13.
6. Haron Ahmad, Mazlam MZ, Aminuddin BA, *et al.* Six year review of gastric carcinoma at the Universiti Kebangsaan Malaysia. *Jurnal Perubatan UKM* 1994;16 : 13-8.
7. Kudva MV, Mazlam Z, Najib Rafee, *et al.* Discriminant value of dyspeptic symptoms in peptic ulcer and non-ulcer dyspepsia. *Med J Malaysia* 1989;44 : 236-42.
8. Logan RPH, Dill S, Bauer FE *et al.* The European ¹³C-urea breath test for the detection of *H. pylori*. *Eur J Gastroenterol Hepatol* 1991;3 : 915-21.
9. Henze E, Malfertheiner P, Clausen M, *et al.* Validation of a simplified carbon-14-urea breath test for routine use for detecting *H. pylori* non-invasively. *J Nuclear Med* 1990;31 : 1940-4.
10. *Helicobacter pylori* in peptic ulcer disease. NIH Consensus Development Panel on *Helicobacter pylori* in peptic ulcer disease. *JAMA* 1994;272 : 65-9.