Role of Biopsy from Gastric Corpus in Diagnosis of *Helicobacter pylori* Infection in Patients on Acid Suppression Therapy

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Abstract

There are reports of migration of *Helicobacter pylori* from the gastric antrum to the proximal stomach following acid suppression therapy. The diagnosis of *H pylori* infection is usually based on rapid urease test and histology of gastric antral biopsies. 50 consecutive patients of peptic ulcer, 22 on proton pump inhibitors and 28 on histamine-2 receptor antagonists for at least 4 weeks were subjected to biopsies from the gastric corpus in addition to the antrum at the time of upper gastrointestinal endoscopy. *H pylori* infection was detected in 42 (84%) patients. The diagnosis was established from both antral and corpus biopsies in 34 (68%) and only antrum in 4 (8%). In 4 patients, 3 on proton pump inhibitors and one on H-2 receptor antagonists, *H pylori* was isolated only from the corpus. The rapid urease test was positive at a mean time of 67.6 minutes from the antrum as compared to 234.6 minutes from the corpus. Testing for *H pylori* from the antrum alone and not the corpus would have resulted in a false negative result in 8% patients. Biopsy from the gastric antrum should always be combined with biopsy from gastric corpus for the diagnosis of *H pylori* infection in patients with dyspepsia on acid suppression therapy.

Key Words : *Helicobacter pylori*; Rapid urease test

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Introduction

In 1983, Warren and Marshall reported isolation of spiral organisms from gastric mucosal biopsy specimens of patients with peptic ulcer disease and chronic gastritis [1]. The *Helicobacter pylori* is a slow growing, microaerophilic, motile, spiral, Gram negative organism that produces abundant urease. Three modes of transmission have been described, viz., oro-faecal, oro-oral and water borne [2]. The organism has been causally linked with gastritis, peptic ulcer, gastric adenocarcinoma and gastric B cell lymphoma. The rapid urease test (RUT) consists of urea rich agar gel medium with a pH sensitive dye. If urease is present in the mucosal biopsy specimen placed in the medium, it results in the hydrolysis of urea[3]. The resultant increase in pH changes the colour of the indicator. Conventionally, the site of gastric biopsy used by most endoscopists is the antrum. Our study aimed at determining the role of gastric corpus biopsy in addition to antral biopsy for the diagnosis of *H pylori* infection.

Material and Methods

50 patients on proton pump inhibitors (PPI) or H2 receptor antagonists (H2RA) for at least 4 weeks for dyspepsia were tested for *H pylori* infection at the time of upper gastrointestinal endoscopy for evidence of active or chronic peptic ulcer. Four quadrant gastric antral biopsies and 2 biopsies from the proximal third of corpus along greater curvature targetted from areas of gastritis, if present, were taken. Two bits of antral biopsy and one from the corpus were placed in separate commercially available RUT, Helikochek, which were considered positive if colour change occurred within 24 hours. The time taken for positivity of the RUT from both sites was noted. If the RUT was negative from any of the two sites, the remaining biopsy bits were subjected to histology for HP stained with haematoxylin and eosin. Patients who received antibiotics over the preceding 4 weeks were excluded.

Results

H pylori infection was detected in 42 (84%) patients. The diagnosis was established by RUT in 40 and by histology in 2 cases. The *H pylori* infection was diagnosed in biopsies from both antrum and corpus in 34 (68%), only antrum in 4 (8%) and only corpus in another 4 patients (Table 1). Of the 4 patients with *H pylori* infection diagnosed only from the corpus, 2 had chronic ulcer and 2 benign gastric ulcer. Two of these had endoscopic evidence of gastritis in the corpus, where the biopsy was targetted. Three of these patients were on PPI and one on H2RA. In patients with RUT positive in both antrum and corpus, the mean time taken for positive colour change in biopsy from antrum was 67.6 (range 2 to 420) minutes as compared to 234.6 (range

Table 1

Diagnosis (No.)	*H pylori* positivity			
	Antrum and corpus	Only antrum	Only corpus	Total (%)
Duodenal ulcer (14) (87.8%)	30	4	2	36
Gastric ulcer (9)	4	-	2	6 (66%)

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2 to 1440) minutes with corpus biopsy tissue. In the 4 patients with RUT positive only from the corpus, the time taken for positivity was 20, 360, 600 and 1200 minutes (mean 545 minutes).

Discussion

The RUT depends on the ability of the *H pylori* to produce urease which digests urea to produce carbon dioxide and ammonium ions which change the colour of the pH indicator phenol red, from yellow to red indicating positive result. Results are available at the end of few minutes to 24 hours. We have shown earlier that the sensitivity and specificity of the RUT is 97% and 95% respectively as compared to 65% and 100% for histology [4]. The advantage of RUT is that it is a rapid method of diagnosis available in the endoscopy theatre and is inexpensive. The recommendations to maximize diagnostic yield for HP infection in gastric mucosal biopsies include obtaining tissue samples from at least 3 sites, viz., lesser curve angularis, greater curve antrum and greater curve corpus [5]. However, due to constraints of time and cost, most endoscopists resort to biopsy from the gastric antrum only. In patients on acid suppression therapy with PPI, it has been shown that *H pylori* may migrate from the antrum to the proximal parts of the stomach [6]. On the contrary, Graham et al in their study demonstrated that *H pylori* does not migrate from the antrum to the corpus in response to omeprazole, thus suggesting that not much is gained by testing biopsy specimens from the corpus [7]. Our study has also shown that testing for *H pylori* from the antrum alone and not the corpus would have resulted in false negative result in 8% patients. The time taken for the positivity of RUT was significantly less for the biopsy taken from the antrum as compared to the corpus, thus indicating that the colonisation with *H pylori* is much more in the antrum as compared to the corpus.

In conclusion, biopsy from gastric antrum should always be combined with biopsy from the gastric corpus, especially in the presence of endoscopic gastritis of the corpus for the diagnosis of *H pylori* infection in patients with peptic ulcer on acid suppression therapy.

References

1. Marshall B. Unidentified curved bacilli in the gastric epithelium in active chronic gastritis. Lancet 1983;1:1273-4.
2. Megraud F. Transmission of *Helicobacter pylori* : faeco-oral versus oral-oral route. Aliment Pharmacol Therapy 1995:9(Suppl 2):85-91.
3. Mobley HLT. The role of *Helicobacter pylori* urease in the pathogenesis of gastritis and peptic ulceration. Aliment Pharmac Therapy 1996;10(Suppl 1):57-64.
4. Seth AK, Nema SK, Gupta ML, Chaudhary R, Saini PP, Dewan RN. Prevalence of *Helicobacter pylori* amongst Armed Forces personnel with dyspepsia and accuracy of inhouse rapid urease test and histology versus commercially available rapid urease test. Indian J Gastroenterol 2000;19(Suppl 2):A125.
5. Genta RM, Graham DY. Comparison of biopsy sites for the histopathological diagnosis of *Helicobacter pylori* : a topographic study of *H pylori* density and distribution. Gastrointest Endosc 1994;40:342-5.
6. Logan RPH, Walker MM, Misiewicz JJ. Changes in the intra-gastric distribution of *Helicobacter pylori* during treatment with omeprazole. Gut 1995;36:112-6.
7. Graham DY, Genta R, Evans DG. *Helicobacter pylori* does not migrate from the antrum to corpus in response to omeprazole. Am J Gastroenterol 1996;91:2120-4.