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A Study of the Concordance Between Endoscopic Gastritis and Histological Gastritis in an Area with a Low Background Prevalence of *Helicobacter Pylori* Infection

Gurjeet Kaur, S Mahendra Raj

ABSTRACT

The concordance between endoscopic and histological gastritis was determined in 52 patients referred for upper gastrointestinal endoscopy. The study was conducted in Northeastern Peninsular Malaysia, an area with a low background prevalence of *H. pylori* infection. Endoscopic and histological gastritis were assessed in accordance with the Sydney System. The results showed poor concordance between endoscopic and histological gastritis even after reclassifying mild endoscopic gastritis as normal. The low prevalence of *H. pylori* was validated in this study.

Keywords: endoscopic gastritis, histological gastritis, low *H. pylori* prevalence

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INTRODUCTION

It is common practice for endoscopists to make judgements on the presence or absence of gastritis on the basis of the endoscopic appearance of the gastric mucosa. The concept of "endoscopic gastritis" was given further credence by the acknowledgement of its existence by the working party that formulated the Sydney System of classifying gastritis[1]. A number of studies have shown that the concordance between endoscopy and histology with regard to the diagnosis of gastritis is abysmal[2-4] while the results of others have suggested that the concordance is not unreasonable[5,6]. The more enthusiastic viewpoint is that concordance may be good in the severe forms of gastritis[1] and that a normal endoscopy excludes active gastritis[7]. The aim of this study was to evaluate the concordance between gastritis as determined by endoscopy and gastritis as defined by histology. This study was undertaken in Northeastern Peninsular Malaysia, an area with one of the lowest background prevalence rates of *Helicobacter pylori* infection reported in the literature[8]. The predictive value of endoscopy in the diagnosis of gastritis in this unique population was therefore of considerable added interest.

**Department of Pathology
School of Medical Sciences
University Sains Malaysia
Kota Bharu
16150 Kelantan,
Malaysia**

G Kaur, MD, MMed (Path), AM, MIAC
Lecturer

Department of Medicine

S M Raj, MBChB, MD, FRCP
Associate Professor

Correspondence to:
Gurjeet Kaur
Tel: (609) 760 2175
Fax: (609) 765 3370
Email: gurjeet@kb.usm.my

METHODS

The subjects consisted of 52 patients referred for upper gastrointestinal endoscopy at the Hospital University Sains Malaysia. Patients were excluded only if their medical condition precluded a proper history or satisfactory endoscopic examination. All endoscopies were performed by a single trained endoscopist. The endoscopist formed a global impression on the presence or otherwise of gastritis in the antrum and body of the stomach. A minimum of two gastric biopsies each were taken from the anterior aspect of the antrum and body respectively, and two each from the posterior aspect of the antrum and body. As the perceived changes on endoscopy are often patchy, for each biopsy, the endoscopist also noted whether the exact site from which the biopsy was taken appeared normal or "inflamed". Biopsies were also taken from the edges of all ulcers. Endoscopic gastritis was classified according to the Sydney system[1].

The gastric biopsies were fixed in 10% formalin and multiple sections of 3 mm thickness were made. All biopsies were stained with the routine haematoxylin and eosin (H&E) stain and further sections stained with the Alcian blue-periodic acid Schiff method. The Warthin Starry stain was employed only in biopsies that showed active gastritis but no *H. pylori* on routine H&E stain. The pathologist was blind to the clinical information and endoscopic findings. The biopsies were assessed histologically in accordance with the Sydney System[9].

STATISTICS

Concordance between endoscopy and histology was assessed in a number of ways. Using each patient as a subject, the concordance between endoscopic and histological gastritis was assessed by calculating the kappa index. This test was repeated after reclassifying mild endoscopic gastritis as being normal. Using each individual biopsy as a subject, the concordance between endoscopic and histological gastritis was again tested by calculating the kappa index. Predictive values of endoscopy in the diagnosis of gastritis were also calculated.

Table I. Frequency of gastritis as diagnosed by endoscopy.

Types of gastritis	Frequency in antrum	Frequency in body
Patchy erythema	13	5
Linear erythema	14	9
Duffuse erythema	2	7
Erosive	6	4
Atrophic	6	1
Normal (no gastritis)	11	26
Total	52	52

Table II. Agreement between endoscopy and histology in individual biopsies of the antrum.

	Endoscopic appearance	
	Normal (n = 116)	Gastritis (n = 96)
Histology normal (n = 96)	59	37
Histological gastritis (n = 116)	57	59

Table III. Agreement between endoscopy and histology in individual biopsies of the body.

	Endoscopic appearance	
	Normal (n = 143)	Gastritis (n = 57)
Histology normal (n = 118)	90	28
Histological gastritis (n = 82)	53	29

RESULTS

A total of 450 biopsies were taken from 52 subjects (33 male, median age 52 years and range 13 to 82 years). The ethnic composition consisted of 71% (31/52) Malays, 21% (11/52) Chinese and one subject each of Burmese, Kampuchean, Bangladesh and Indian origin. There was no correlation between age and prevalence of gastritis.

Table I summarises the type and frequency of endoscopic gastritis. With regard to severity of endoscopic gastritis in the antrum, 15 cases were considered mild, 20 moderate and six severe. Body gastritis was graded as mild in 17, moderate in six and severe in three patients. Thirteen patients had evidence of ulcers, six of whom had gastric ulcers, six had duodenal ulcers and one had both gastric and duodenal ulcers.

Eighteen of the total 450 biopsies were considered unsatisfactory for histological evaluation. Thirty-three (63.5%) of the subjects had evidence of histological gastritis. Of these, 48% (25/52) had idiopathic chronic gastritis, while 13.5% (7/52) had *H. pylori*-associated gastritis. One subject showed regenerative changes. In the assessment of inflammation, 59.6% (31/52) of the subjects had evidence of antral inflammation which was mild in 15, moderate in seven and severe in nine. In the body, 42.3% (22/52) had gastritis. Inflammation was mild in 11, moderate in seven and severe in four.

Activity was graded as mild, moderate and severe. In the antrum, the activity was mild in seven subjects, moderate in four and severe in three. Thirty-eight (73.1%) subjects showed no evidence of activity in the antrum. In the body, mild activity was seen in six subjects, moderate in two and severe in three, while 41 (78.9%) subjects did not exhibit activity.

Seven of the 52 subjects (13.5%) showed evidence of *H. pylori* colonisation. Only one of them was a Malay. All *H. pylori*-infected subjects had histological evidence of gastritis.

In the analysis of concordance between endoscopic and histological gastritis using each patient as a subject, agreement that gastritis was present in the antrum occurred in 26 cases and that gastritis was absent in six cases. The kappa statistic was 0.13. After reclassifying mild endoscopic antral gastritis as normal, the concordance rate between endoscopy and histology was 60% (31/52) with the agreement of normality in 13 cases and of gastritis in 18 cases. The kappa statistic was 0.2. With regard to the body, there was agreement between endoscopy and histology in 58% (30/52) of cases. Agreement on the presence of gastritis occurred in 13 cases and the absence of it in 17 cases. The kappa statistic was 0.16. Repeated analysis after recoding mild endoscopic body gastritis as normal raised the concordance rate to 63% (33/52) but the kappa statistic did not change appreciably at 0.18.

After excluding biopsies from ulcers and biopsies that were inadequate for histological interpretation, 412 biopsies were analysed to test the concordance between endoscopy and histology in individual specimens. Agreement on the presence or absence of gastritis occurred in 58% (237/412). The calculated kappa statistic was 0.16. When the antrum and body were analysed separately the agreement between endoscopy and histology was poor in both parts of the stomach, the kappa statistic being 0.12 and 0.13 in the antrum and body respectively (Tables II and III).

The positive predictive value (PPV) of endoscopy in the diagnosis of antral gastritis was 63% while the negative predictive value (NPV) was 55%. After reclassifying mild endoscopic gastritis as normal, the PPV and NPV in the antrum were 69% and 50% respectively. The PPV and NPV values of endoscopy in the body of the stomach were 50% and 65% respectively and after reclassifying mild endoscopic gastritis as normal, the PPV and NPV were 67% and 63% respectively.

DISCUSSION

The results of the study show unequivocally that the concordance between gastritis as diagnosed on endoscopy and by histology is very poor. The analysis was repeated after reclassifying mild endoscopic gastritis as normal, because it was reasoned that the greatest difficulty for the endoscopist would be to make a decision between normality and mild erythema. Despite this, the concordance did not change appreciably, refuting the notion that agreement is better when gastritis is severe.

The commonest type of gastritis diagnosed endoscopically was erythematous gastritis which was present in the antrum of 71% (29/41) of subjects and in the body in 81% (21/26) of cases. However there is subjectivity in determining the varying intensities of erythema and there was no significant correlation between erythematous gastritis and histological gastritis. On the other hand, erosive gastritis is a fairly distinct and easily recognisable endoscopic entity. Of the six patients with erosive gastritis in the antrum, two had histologically normal biopsies and evidence of activity (neutrophilic infiltration) was seen in three of the other four cases. Among the cases of erosive gastritis in the body, histology was normal in two. Notwithstanding the small numbers of patients with erosive gastritis, it does not seem that inflammation is an invariable feature of erosive gastritis.

The other major finding in this study is that the prevalence of *H. pylori* infection in this series was 13.5% (7/52), a rate which is exceptionally low considering that the study sample consisted of a series of patients referred for endoscopy. It is also striking that while Malays formed the predominant ethnic group in the study sample as a whole, only one of the seven *H. pylori* positive subjects was a Malay. This finding validates our previous experience of an unusually low prevalence of *H. pylori* infection in the predominantly Malay population of Northeastern Peninsular Malaysia[8]. Indeed the unique feature of this study was that it was conducted in a population with a low background prevalence of *H. pylori* infection. As expected, all seven subjects with *H. pylori* infection had histological evidence of gastritis.

Endoscopists often report the presence of "gastritis" based on the macroscopic appearance of erythema of the gastric mucosal surface. This study brings this practice into question as there is no correlation between the naked eye appearance of varying degrees of erythema and histological gastritis, at least in areas with the same background prevalence of *H. pylori* as the study area. Equally, the naked eye suspicion of "gastritis" on endoscopy should not be used to select patients for *H. pylori* testing. If it is clinically relevant to know the *H. pylori* status or to determine the presence of chronic gastritis in an endoscoped patient, biopsies should be taken irrespective of the macroscopic appearance.

In conclusion, endoscopy is an unreliable predictor of histological gastritis in a population with a low background prevalence of *Helicobacter pylori* infection.

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