

## Histopathology of *Helicobacter pylori* in Chronic Dyspepsia Patients

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### ABSTRACT

**Background:** *Helicobacter pylori* (*H. pylori*) are the most common infection found in dyspepsia cases. This infection is almost always found in digestive tract inflammation and commonly develops into chronic gastritis. Meanwhile, chronic gastritis is a condition assumed as the early event in pathological abnormalities of the stomach which finally may develop into carcinoma of the gaster. In Indonesia, data describing the incidence of *H. pylori* infection based on the histopathological appearance, location of specimen collection, inflammatory degree, and age of chronic dyspepsia patients is not yet available. The aim of this study is to determine the incidence of *H. pylori* based on histopathology appearance in chronic dyspepsia patients in Moewardi Hospital Surakarta.

**Method:** This study is a cross sectional descriptive study by performing endoscopy-biopsy and histopathology examination to chronic dyspepsia patients who came to Gastroenterohepatology Clinic, Department of Internal Medicine, Moewardi Hospital, Surakarta on 1 January 2009 - 31 December 2010.

**Results:** More than 90% subjects were > 40 year old with the distribution of majority patients were 46-55 year old (32.43%). The most commonly found endoscopic appearance in subjects with positive *H. pylori* was superficial chronic gastritis (81.08%) with mild inflammatory degree (64.86%) and majority located in the antrum 97.3%.

**Conclusion:** The proporsion of *H. pylori* infection in male and female was almost equal and was mostly found in the age group of 46-55 year old. This infection frequently happens in chronic dyspepsia who has histopathologic appearance of superficial chronic gastritis with mild inflammatory degree in the antrum area.

**Keywords:** *Helicobacter pylori*, superficial chronic gastritis, age

### ABSTRAK

**Latar belakang:** *Helicobacter pylori* merupakan infeksi yang paling sering dijumpai pada kasus-kasus dispepsia. Infeksi ini hampir selalu ditemui pada inflamasi saluran cerna dan umumnya berkembang menjadi gastritis kronik. Sementara itu, gastritis kronik merupakan suatu kondisi yang diasumsikan sebagai peristiwa awal dari rangkaian kelainan patologi pada lambung yang akhirnya dapat berkembang menjadi karsinoma lambung. Di Indonesia sendiri, data yang mendeskripsikan kejadian infeksi *Helicobacter pylori* berdasarkan gambaran histopatologi, lokasi pengambilan spesimen, derajat peradangan, dan usia penderita dyspepsia kronik belum ada. Penelitian ini bertujuan untuk mengetahui kejadian *Helicobacter pylori* berdasarkan histopatologi pada penderita dispepsia kronik di Rumah Sakit Moewardi Surakarta.

**Metode:** Penelitian ini merupakan studi deskriptif potong lintang dengan melakukan tindakan endoskopi-biopsi dan pemeriksaan histopatologi pada penderita dispepsia kronik yang datang ke poliklinik Gastroenterohepatologi

Departemen Ilmu Penyakit Dalam Rumah Sakit Moewardi Surakarta pada 1 Januari 2009 – 31 Desember 2010.

**Hasil:** Sebanyak 91,89% subyek berusia lebih dari 40 tahun dengan distribusi kelompok usia terbanyak adalah umur 46-55 tahun (32,43%). Gambaran endoskopi paling banyak yang ditemukan pada subyek dengan *Helicobacter pylori* positif adalah gastritis kronik superfisialis (81,08%) dengan derajat peradangan ringan (64,86%) dan lokasi terbanyak pada antrum sebesar 97,3%.

**Simpulan:** Proporsi infeksi *Helicobacter pylori* pada laki-laki dan perempuan hampir sama dan paling banyak ditemukan pada kelompok dengan rentang usia 46-55 tahun. Sebagian besar terjadi pada dyspepsia kronik yang memiliki gambaran histopatologi gastritis kronis superfisialis dengan derajat peradangan ringan di daerah antrum.

**Kata kunci:** *Helicobacter pylori*, gastritis kronis superfisialis, usia

## INTRODUCTION

Dyspepsia sits on the fourth rank in the most frequent complaint coming to the primary health care service. It is estimated that, this is 30% of the cases in general practice and 60% in gastroenterology practice. The possible reason which underlies this complaint is abnormality in the digestive tract, starting from peptic ulcer to malignancy. A factor which has been said to play role in the digestive tract pathology particularly gastrointestinal is *Helicobacter pylori* (*H. pylori*) infection. Turkay et al confirmed that *H. pylori* infection was always found in gastric inflammation and caused chronic gastritis. It was also assumed that findings in the stomach, such as chronic gastritis, atrophy, or even intestinal metaplasia and dysplasia were associated with this infection.<sup>1</sup> Based on literature review conducted by Child et al on management of *H. pylori* infection in primary health care, it was affirmed that there was strong evidence on the involvement of *H. pylori* in gastric and duodenal ulcer. This strong evidence also support eradication therapy.<sup>2</sup> *H. pylori* is the main etiology in peptic ulcer and definitive type I carcinogen in gastric carcinoma. In developed countries, the prevalence of this infection is about 30-40%. However, in developing countries, the prevalence could be up to 80-90%. In Indonesia, the prevalence of *H. pylori* reaches 36-46.1% with the youngest patient aged 5 months, and found in 5.3-15.4% patients aged less than 5 year old.<sup>3</sup>

Although the prevalence is quite high, transmission process, and pathomechanism of this bacterial infection in various pathological conditions of upper digestive tract is still unclear. However, eradication of this microorganism in gastrointestinal pathologic cases has been proven to be beneficial. American College of Gastroenterology recommends *H. pylori* examination to patients who came with complain of dyspepsia

without alarm signs.<sup>4</sup> Following in 2009, Sander et al recommended urea breath test (UBT) examination in patients aged less than 50 year old who came with dyspepsia without alarm signs, gastroesophageal reflux diseases (GERD) symptoms, or history of NSAIDs use. Sander et al also suggested eradication of *H. pylori* if UBT examination showed positive results.<sup>5</sup>

To recommend *H. pylori* eradication in Indonesia, it definitely needs strong empirical evidence which can be the underlying necessity of eradication. One of those empirical evidences is that the incidence of *H. pylori* infection has strong significant correlation with fatal pathological findings, such as gastric carcinoma in chronic dyspepsia patients in Indonesia. Therefore, the availability of the data describing the incidence of *H. pylori* infection in various histopathology and location of tissue sampling from chronic dyspepsia patients become important.

## METHOD

This study is a descriptive study which aimed to obtain a picture of *H. pylori* infection incidence in various histopathological appearance in patients who come with chronic dyspepsia, majority histopathological appearance found in subjects with positive *H. pylori*, and the most common biopsy location which showed positive *H. pylori*.

Patient coming to Moewardi Hospital with the complaint of dyspepsia, to whom endoscopic examination and biopsy were performed were enrolled to this study. This study was conducted for two years, starting from 1 January 2009 - 31 December 2010 and 110 patients who came from Surakarta Residency (Solo, Sragen, Karanganyar, Sukoharjo, Wonogiri, Klaten and Boyolali) were obtained. Patients who were 18 year old or younger were excluded.

Chronic dyspepsia is limited to collection of symptoms or signs comprises of epigastric pain or discomfortness, nausea, vomiting, bloating, easily satiated, stomach fullness, burping, regurgitation, and burning sensation in the chest.<sup>3</sup>

To each patient, tissue samples were obtained from two locations, which were from the antrum and corpus. Diagnosis of *H. pylori* infection and inflammatory degree were made through anatomic pathology examination from results of biopsy endoscopy procedure.

**RESULTS**

As much as 110 patients were enrolled in this study. Subjects comprises of 57 (51.82%) males and 53 (48.18%) females. The age of 89 (80.91%) subjects is ≥ 40 year old. Based on the city origin, 38 (34.54%) came from Surakarta, 17 (15.45%) from Sragen, 16 (14.54%) from Karanganyar while the others came from Sukoharjo, Wonogiri, Klaten, and Boyolali (Table 1).

**Table 1. Subject characteristic**

Criteria	n (%)
Sex	
Male	57 (51.82)
Female	53 (48.18)
Age (year)	
< 40	21 (19.09)
≥ 40	89 (80.91)
Hometown	
Surakarta	38 (34.54)
Sragen	17 (15.45)
Karanganyar	16 (14.54)
Sukoharjo	9 (8.18)
Wonogiri	16 (14.54)
Klaten	10 (9.09)
Boyolali	4 (3.64)

From 110 subjects with chronic dyspepsia who fulfilled the inclusion criteria, *H. pylori* infection is found in 37 (33.64%) subjects with almost equal ratio of male and female (18 : 19). Meanwhile, based on age group, this infection was majorly found in subjects aged 44-65 year old with youngest subject aged 30

year old and the eldest aged 83 year old. Endoscopy examination to reveal histopathological appearance was performed in all subjects. Based on the location of biopsy in specimen sampling, incidence of *H. pylori* was mostly found in the antrum, to be exact in 36 specimens. Mainly biopsy results exhibited mild inflammatory results (G1) which were found in 25 specimens. Distribution of *H. pylori* infection incidence based on subject characteristics and histopathological findings can be seen in Table 2.

**Table 2. Distribution of positive *Helicobacter pylori* infection incidence based on patients characteristics and histopathological finding**

Criteria	Positive <i>Helicobacter pylori</i>	Negative <i>Helicobacter pylori</i>
Sex		
Male	18	39
Female	19	34
Age (year)		
< 40	3	18
≥ 40	34	55
Hometown		
Surakarta	14	24
Sragen	4	13
Karanganyar	6	10
Sukoharjo	6	3
Wonogiri	5	11
Klaten	2	8
Boyolali	-	4
Histopathology		
Superficial chronic gastritis	30	53
Active chronic gastritis	4	16
Mild dysplasia	3	3
Adenomatous polyp	-	1
Ulcerative gastritis	1	-
Location of biopsy		
Antrum	36	74
Corpus	1	109

Majorly the histopathological appearance found was superficial chronic gastritis which was revealed in 83 subjects (46 male subjects and 37 female subjects). From those 83 subjects, *H. pylori* infection was found in 30 subjects with the same proportion between male and female subjects. Distribution of *H. pylori* infection incidence based on endoscopic diagnosis and sex can be seen in Table 3.

**Table 3. Distribution of subjects determined by sex, age, and *Helicobacter pylori* infection based on endoscopic diagnosis**

Diagnostic	Sex		<i>Helicobacter pylori</i> infection				Age (year)	
	Male	Female	Positive		Negative		< 40	> 40
			Male	Female	Male	Female		
Superficial chronic gastritis	46	37	15	15	31	22	2	28
Active chronic gastritis	7	13	1	3	6	10	1	3
Mild dysplasia	3	2	1	1	2	1	-	2
Adenomatous polyp	-	1	-	-	-	1	-	-
Gastric ulcer	1	-	1	-	-	-	-	1

Most endoscopic appearance found was superficial chronic gastritis 83 samples, with inflammation location in the antrum with various inflammatory degree. While others endoscopic appearances varied from active chronic gastritis, mild dysplasia, adenomatous polyp, and gastric ulcer were only found in the antrum (Table 4).

Results of endoscopic appearance of patients with positive *H. pylori* infection, majorly were superficial chronic gastritis. Only two of patients with positive *H. pylori* infection showed mild dysplasia and no one of them showed adenomatous polyp or gastric ulcer on endoscopic examination (Table 5).

## DISCUSSION

Incidence of *H. pylori* infection based on sex varies in different countries. In this study, it was obtained that there was no big difference in the incidence of *H. pylori* infection in chronic dyspepsia patients between female and male patients, in which the ratio of female/male was 1.05. Similarly, a study conducted in India found that the ratio of female/male with *H. pylori* infection was 1.44.<sup>6</sup> Meanwhile, in a study conducted by Javed M et al, it was stated that incidence of *H. pylori* infection in dyspepsia patients was higher in male.<sup>7</sup> Alazmi reported an opposing result and Kumar et al acknowledged that in the population of *H. pylori* infection, in which their study was performed, 65% was male and the rest was female.<sup>8,9</sup>

Based on the age group in this study, it was obtained that more patients aged > 40 year old were infected with *H. pylori* (34 subjects). In the distribution of patients based on age, this infection was mainly found in the age group of 46-55 year old (fourth to fifth decade), which was in concordance with the other earlier studies.<sup>7</sup> This was in line with what reported by Javed et al, that the prevalence of *H. pylori* infection increased with age.<sup>7</sup> Different prevalence based on age group may be caused by two possibilities, such as infection can be obtained during childhood or after adulthood.

From this study, general anatomy pathology appearance obtained from endoscopy biopsy was superficial chronic gastritis with mild inflammatory degree, with the location of sampling was from the gastric mucosa in the antral area. Furthermore, in patients with positive *H. pylori* infection, mostly the anatomy pathology appearance was superficial chronic gastritis with mild inflammatory degree, location of biopsy sampling was from the gastric mucosa at the antral area. This finding was different with the study done by Turkay et al which declared that there was no significant difference in positive *H. pylori* in biopsy samples taken from the antrum or corpus.<sup>1</sup> A study performed by Kumar et al revealed similar results that superficial chronic gastritis was found in almost 95% of population infected by *H. pylori*, in which the study was performed.<sup>9</sup> Besides, another study done in Northeastern Mexico reported different results, about 80% of the population infected by *H. pylori* showed

**Table 4. Endoscopic appearance based on the location specimen was obtained and inflammatory degree**

Results of endoscopic appearance	Severity of inflammatory degree*							
	Antrum				Corpus			
	G0	G1	G2	G3	G0	G1	G2	G3
Superficial chronic gastritis	2	59	14	6	-	7	3	-
Active chronic gastritis	-	10	7	3	-	-	-	-
Mild dysplasia	-	3	-	2	-	-	-	-
Adenomatous polyp	-	-	-	1	-	-	-	-
Gastric ulcer	-	1	-	-	-	-	-	-

\*Inflammatory cells consist of lymphocytes, plasma cells, granulocyte in lamina propria; G0 = absent, G1 = mild, G2 = moderate, G3 = severe

**Table 5. Distribution of endoscopic appearance with inflammatory degree, location of sample collection, and positive *Helicobacter pylori* infection**

Anatomy pathology appearance	Severity of inflammatory degree*							
	Antrum				Corpus			
	G0	G1	G2	G3	G0	G1	G2	G3
Superficial chronic gastritis	-	16	3	2	-	1	-	-
Active chronic gastritis	-	8	2	3	-	-	-	-
Mild dysplasia	-	-	-	2	-	-	-	-
Adenomatous polyp	-	-	-	-	-	-	-	-
Gastritis ulcer	-	-	-	-	-	-	-	-

\*Inflammatory cells consist of lymphocytes, plasma cells, granulocytes in lamina propria; G0 = absent, G1 = mild, G2 = moderate, G3 = severe

histopathological appearance in the form of non-ulcerative dyspepsia.<sup>10</sup>

## CONCLUSION

Proportion of *H. pylori* infection was almost equal in male and female and was mainly found in the age group of 46-55 year old. Mostly happened in chronic dyspepsia who has superficial chronic gastritis histopathology with mild inflammatory degree in the antrum. Further research is needed to explore more variables of subject characteristics with positive *H. pylori* appearance. This will give more information on patients who may need *H. pylori* eradication in patients with complaint of chronic dyspepsia without alarm signs.

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