

Research Article

## Histopathological Features of the Gastric Mucosa in Patients with Chronic Gastritis and *Helicobacter pylori* Infection at Pertamina Central Hospital Jakarta

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### ABSTRACT

**Background:** Chronic gastritis is a chronic inflammation of the gastric mucosa, accompanied by changes in mucosal histology with or without *Helicobacter pylori* infection. Changes in the gastric mucosa include gastric mucosal atrophy, intestinal metaplasia, and epithelial dysplasia. **Purposes:** This study aims to determine the microscopic appearance of the mucosa in chronic gastritis patients based on standard histopathological criteria, which include gland atrophy, intestinal metaplasia, dysplasia with or without *Helicobacter pylori* infection at Pertamina Central Hospital Jakarta period 2018 - 2019. **Methods:** This retrospective study was conducted in a cross-sectional study from March 15 to March 25, 2020. **Results:** This study reported 303 cases of active chronic gastritis (38.4%) out of 790 total samples that met the inclusion criteria. Microscopic changes of the mucosa were found in the form of atrophy of the mucous glands in 254 cases (32.2%), intestinal metaplasia in 25 cases (3.2%), and epithelial dysplasia cases in 23 cases (2.9%). **Conclusion:** the proportion of active chronic gastritis patients found in this study was helicobacter pylori infection is more dominantly found in patients with active chronic gastritis than in non-active chronic gastritis. The description of atrophic glands in chronic gastritis patients was more dominant than parameters based on intestinal metaplasia and epithelial dysplasia. It was a finding of intestinal metaplasia compared to all cases showing risk factors that require further clinical observation (follow-up) to detect potential malignancies earlier so that it is necessary to do more preventive action.

**Keywords:** dysplasia, gastric mucosal atrophy, histopathology of chronic gastritis, *Helicobacter pylori*, intestinal metaplasia

### INTRODUCTION

Gastritis is an inflammation of the gastric mucosa which can be caused by irritation or infection. The word "gastritis" was first used by a physician from Germany, George Ernst Stahl, to describe inflammation in the stomach lining or what we now know as mucosal damage (1). Gastritis is a disease that is most often found in hospitals or clinics. In most cases, inflammation of the gastric mucosa does not relate to the

patient's clinical complaints and symptoms, but the patient's complaints and clinical symptoms are related to gastritis complications (2). Gastritis can be caused by several conditions, such as *Helicobacter pylori* (*H.pylori*) infection, non-steroidal anti-inflammatory drugs (NSAIDs), alcohol, stress, and autoimmune. *H.pylori* infection is the most common type of bacteria involved in chronic gastritis infection, where the prevalence of *H.pylori*

infection in developing countries is higher (80-90%) compared to developed countries (30-40%) (2-5).

Research in 2005 by Zhang et al. showed that the favorable rates of glandular atrophy and intestinal metaplasia in superficial gastritis, erosive gastritis, gastric erosion, and gastric ulcer patients with *H.pylori* positive were significantly higher than those with *H.pylori* negative (6). Patients with chronic gastritis require histopathological examination of the mucosa with standard parameters to determine the active or inactive process with the discovery of *H.pylori* infection (2). This study aims to see the histopathological features of the gastric mucosa in gastritis patients and the possibility of *H.pylori* infection.

## METHODS

This study is a retrospective cross-sectional study by collecting secondary data from the results of all cases with a diagnosis of chronic gastritis by examining anatomical pathology in the period 2018-2019 according to the inclusion criteria with a determination of sample selection based on purposive sampling technique.

The standard parameters for microscopic examination of gastric mucosal biopsy patients with chronic gastritis include glandular atrophy, intestinal metaplasia, dysplasia, and *H.pylori* infection as inclusion criteria at Pertamina Central Hospital Jakarta from January 1, 2018-December 31, 2019. This research has received ethical approval from the Ethics Committee for health research from the Faculty of Medicine and Health, Universitas Muhammadiyah Jakarta, based on decree no: 165/PE/KE/FKK-UMJ/XI/2020.

## RESULT

In this study, there were 790 cases of chronic gastritis, 303 cases (38.4%) of active chronic gastritis, cases with findings of *H.pylori* infection in 17 patients (2.2%), gastric mucosal atrophy in 254 patients (32.2%), intestinal metaplasia in 25 patients (3.2%), dysplasia in 23 patients (2.9%).

**Table 1.** Frequency Distribution of Chronic Gastritis based on Histopathological Features

Histopathological Features	Frequency (n = 790)	Percentage (%)
<b>Gastric mucosal atrophy</b>		
Found	254	32.2 %
Not found	536	67.8 %
<b>Metaplasia Intestinal</b>		
Found	25	3.2 %
Not found	765	96.8 %
<b>Dysplasia</b>		
Found	23	2.9 %
Not found	767	97.1 %

**Table 2.** Frequency Distribution of Chronic Gastritis based on finding *H.pylori* Infection and Active/Non Active Inflammation

Histopathological Features	Frequency (n = 790)	Percentage (%)
<b>Chronic Active Gastritis</b>		
Chronic active Gastritis	303	38.4%
Chronic non active Gastritis	487	61.6%
<b><i>H.pylori</i> Infection</b>		
Found	17	2.2 %
Not found	773	97.8 %

**Tabel 3.** Distribution of Chronic Gastritis Patients based on Findings of *H.pylori* Infection in Active/Inactive Inflammation

Infection by <i>H. pylori</i>	Chronic Gastritis	
	Active	Non active
Found	15	2
Not found	288	485

## DISCUSSION

This retrospective study showed that the number of cases of chronic gastritis for two years was 790 patients where cases of chronic gastritis were inactive with mucosal histopathological features not finding neutrophil inflammatory cells. This study found the histopathological description of active chronic gastritis in 303 patients (38.4%). Research in 2017 by C. Jayanthi et al. at Sri Venkateshwara Medical College Hospital and Research Center found as many as 32.4% of active chronic gastritis cases. Inflammation of neutrophil cells in the stomach indicates the active course of the disease (7,8).

The findings of infection with *H.pylori* bacteria were found only in 17 cases with a percentage of 2.2%. Meanwhile, the research conducted by C. Jayanthi et al. found 35.6% of *H.pylori* bacteria. In research at Kariadi Hospital Semarang for similar cases (cases between 2011–2013) was 50-79% while the results of other studies at 2013, by Jihwan Lim, et al. with the determination of sample selection based on purposive sampling technique shows a higher percentage, which is 83.1%.

After acute infection with *H.pylori*, acute gastritis can progress to chronic gastritis. Infection is associated with the presence of hypochlorhydria and neutrophil infiltration in the gastric biopsy tissue mucosa. The presence of neutrophil inflammatory cells is an immune reaction to *H.pylori* infection. Continuous inflammation can cause gastric atrophy so that the mucous glands will be reduced in number and related to gastric acid production, resulting in hypochlorhydria or achlorhydria. These changes can cause chronic multifocal gastritis that progresses more progressively so that intestinal metaplasia

often occurs as a mucosal adaptation aimed at balancing areas of the gastric mucosa that are higher in gastric acid. The presence of this intestinal metaplasia picture can develop into dysplastic mucosal epithelium, which is a precancerous area that later becomes gastric cancer (9).

The description of gastric mucosal atrophy in patients with chronic gastritis at Pertamina Central Hospital Jakarta was found in 254 patients with a percentage of 32.2%. Another study conducted by C. Jayanthi et al. showed a low percentage of gastric mucosal atrophy findings of 0.4%. Another study also conducted by Garg et al. showed the percentage of gastric mucosal atrophy was 12.33%. This indicates that the appearance of gastric mucosal atrophy in chronic gastritis patients at Pertamina Central Hospital Jakarta is quite a lot (8,10).

In the normal stomach, there are different glands (mucosecreting or oxyntic glands) according to their function, namely the antrum and the corpus (appropriate glands). Meanwhile, in the atrophic condition of the gastric mucosa, atrophic glands will be replaced by fibrosis, and intestinal metaplastic or pseudopyloric epithelial cells can develop. The presence of these metaplastic intestinal glands that will be replaced can cause the "appropriate" gland structure to decrease. Oxyntic mucosal atrophy may be associated with loss of gastric secretions. This condition associated with loss of "appropriate glands" is closely related to gastric malignancy, which is characterized by altered epithelial dysplasia as a risk factor for gastric cancer (11).

An overview of intestinal metaplasia in patients with chronic gastritis at Pertamina Central Hospital Jakarta from 2018 - 2019 found as many as 25 cases with a percentage of 3.2%. In another study

conducted by Manoj Saxena, intestinal metaplasia was found in 0.16% of subjects in chronic gastritis. Research conducted at the Gastroenterology Center in Craiova showed a percentage of 61.6% with intestinal metaplasia in patients with chronic gastritis. In a study also conducted by Garg et al., the rate of intestinal metaplasia was 7%. Meanwhile, in a study conducted by C. Jayanthi et al, there were 22.8% of intestinal metaplasia (8,10,12,13).

In the microscopic findings of mucosal epithelial dysplasia, 23 cases were found with a percentage of 2.9%. Research by Jihwan Lim et al. reported 11% cases of dysplasia. Gastric dysplasia is usually classified into Low-Grade Dysplasia (LGD) and High-Grade Dysplasia (HGD). Gastric dysplasia has a high risk of synchronous carcinoma in other areas of the stomach (14).

According to the American Society for Gastrointestinal Endoscopy (ASGE), it is necessary to observe or follow up in the form of endoscopy one year after resection of gastric dysplasia (15). Based on the microscopic picture of active chronic gastritis cases in RSP, the findings of positive *H.pylori* infection were more than those from unexplained chronic gastritis cases.

## CONCLUSION

The proportion of active chronic gastritis patients found in the study at Pertamina Central Hospital reached 303 cases (38.4%). *H.pylori* infection is more dominantly found in patients with active chronic gastritis than in non-active chronic gastritis. The description of atrophic glands in chronic gastritis patients at the Pertamina Hospital in the 2018-2019 period was more dominant than parameters based on

intestinal metaplasia and epithelial dysplasia.

It was finding of Intestinal metaplasia in as many as 25 patients (3.2%) and dysplasia in 23 patients (2.9%) compared to all cases showing risk factors that require further clinical observation (follow-up) to detect potential malignancies earlier so that it is necessary to do more preventive action.

## ACKNOWLEDGMENT

The author thanks the Director of Pertamina Central Hospital and its range that have allowed to become this research place, head of the installation laboratory of Anatomy Pathology, Pertamina Central Hospital, and Anatomic Pathology Laboratory Technicians who helped us to take a lot of secondary data sampling.

## CONFLICT OF INTEREST

None.

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