

# Prevalence of *Helicobacter pylori* Infection in Adult Patients with Dyspeptic Symptoms in Abdi Waluyo Hospital Jakarta from January 2017 to December 2019

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## ABSTRACT

**Background:** *Helicobacter pylori* infection is a global public health problem and may be present in more than half of the world's population. Prevalence in developing country higher compared to developed country. However, in Indonesia prevalence of *Helicobacter pylori* infection is still low compare to other Asian countries. This study aims to determine the prevalence of *Helicobacter pylori* infection in Abdi Waluyo Hospital Jakarta from January 2017 to December 2019.

**Method:** In this descriptive study, a total of 772 adult patients were tested using Urea Breath Test-14C for detection of isotopic carbon produced by *Helicobacter pylori* ability to broke down urea.

**Results:** Prevalence of *Helicobacter pylori* infection in Abdi Waluyo hospital between January 2017 – December 2019 was 20.98% with endoscopic findings as follows: 17.48% with gastritis, 3.24% with gastric ulcers , 0.26% with gastric cancer

**Conclusion:** Increase prevalence of *Helicobacter pylori* infection every year in Abdi Waluyo hospital. It is suggested to perform Urea Breath Test for adult patients with dyspeptic symptoms to screened *Helicobacter pylori* infection.

**Keywords:** *Helicobacter pylori* infection, urea breath test, prevalence, gastritis, gastric ulcer, gastric malignancy

## ABSTRAK

**Latar belakang:** Infeksi *Helicobacter pylori* merupakan masalah kesehatan masyarakat dunia dan mungkin telah ada dalam lebih dari setengah populasi dunia. Prevalensi di negara berkembang lebih tinggi dibandingkan dengan negara maju. Akan tetapi, di Indonesia prevalensi infeksi *Helicobacter pylori* lebih rendah dibanding dengan negara Asia lainnya. Penelitian ini bertujuan menentukan prevalensi infeksi *Helicobacter pylori* di Rumah Sakit Abdi Waluyo Jakarta dari Januari 2017 sampai Desember 2019.

**Metode:** Dalam penelitian potong-lintang ini, total 772 pasien dewasa diuji menggunakan Uji Nafas Urea-14C untuk mendeteksi isotop karbon yang dihasilkan oleh kemampuan *Helicobacter pylori* dalam mengurai urea.

**Hasil:** Prevalensi infeksi *Helicobacter pylori* di Rumah Sakit Abdi Waluyo dari Januari 2017-Desember 2019 adalah 20.98% dengan hasil endoskopi seperti berikut: 17.48% dengan gastritis, 3.24% dengan tukak peptik, 0.26% dengan keganasan lambung.

**Simpulan:** Kenaikan prevalensi dari infeksi *Helicobacter pylori* setiap tahunnya di Rumah Sakit Abdi Waluyo. Disarankan untuk melakukan Uji Nafas Urea untuk pasien dengan keluhan dyspepsia untuk skrining infeksi *Helicobacter pylori*.

**Kata kunci:** infeksi *Helicobacter pylori*, urea breath test, prevalensi, gastritis, tukak peptik, keganasan lambung

## INTRODUCTION

*Helicobacter pylori* is a gram-negative bacillus that grows in the digestive tract. Some studies have shown that approximately 50% of the world population is infected with the organism, and the prevalence is higher in developing countries like Indonesia.<sup>1</sup> There is an association between the gastric colonization of *H. pylori* and chronic gastritis, peptic ulcer diseases and gastric cancer.<sup>2</sup> Varied prevalence in different locations in Indonesia maybe because several factors related to host-agent-environment.<sup>3</sup> There are several risk factors for *Helicobacter pylori* infection are related to: crowded conditions, no supply of clean water, developing country, living with someone who has a *Helicobacter pylori* infection.<sup>4</sup>

*Helicobacter pylori* can survive in acidic environment of the stomach. *Helicobacter pylori* infection often don't have any symptoms but can lead to gastritis, peptic ulcer, dan gastric malignancy. The most common manifestation of *Helicobacter pylori* is gastritis. Almost 95% of the infected patients usually have antral gastritis which predisposes to duodenal ulcers, whereas the less common corpus-predominant gastritis is a risk factor for gastric ulcers.<sup>5</sup> Patients younger than 55 years old who have new-onset dyspepsia without alarm features (family history of proximal gastrointestinal cancer, gastrointestinal bleeding, odynophagia, progressive dysphagia, unexplained iron-deficiency anemia, unintentional weight loss, persistent vomiting, palpable mass or lymphadenopathy, jaundice) should undergo *Helicobacter pylori* testing and treatment if the infection is confirmed.<sup>6</sup>

Many invasive and non-invasive methods can be used to diagnose *H. pylori* infection, including endoscopy with biopsy, serology for immunoglobulin titers, stool antigen analysis, and the urea breath test (UBT). Positive UBT indicates an active *H. pylori* infection which require treatment or further confirmation with invasive procedures.<sup>7</sup> Therefore, this study aims to describe the Prevalence of *Helicobacter pylori* infection in adult patients with dyspeptic

symptoms in Abdi Waluyo Hospital Jakarta from January 2017 to December 2019, where we tried to confirmed the positive UBT result with morphological images of the gaster by gastroscopy.

## METHOD

This study is a descriptive study of 772 adult patients more than 18 years of age admitted and outpatient with dyspeptic symptoms at Abdi Waluyo Hospital from January 2017 to December 2019. All adult patients were tested for *Helicobacter pylori* infection using UBT-14C. All patients need to stop taking any *Helicobacter pylori* sensitive medicine such as antibiotics, bismuth and proton pump inhibitor compound one month before the test since the medicine may affect the test results. Patients prepared for the breath test by fasting for at least 3 hours before taking a capsule with warm water. The whole capsule must be swallowed without chewing or broken. After waiting for 15 minutes, patient will be required to blow to the breath card until the indicator turned to the right colour. The card will then plug into the slot of the analyzer to obtain the diagnostic results. The entire process of the breath test will take about 25 minutes. We log and process the datum with Microsoft Excel 2010.

## RESULTS

A total of 772 adult patients were tested with UBT and underwent endoscopic procedure in Abdi Waluyo Hospital. Table 1 shows the gender distribution of patients with positive UBT. Table 2 shows age distribution of patients with positive UBT. Age group 46-60 years shows the most number of patients with UBT positive. In Table 3 and 4 shows prevalence of UBT positive patients dan the endoscopic findings of those patients. Prevalence of *Helicobacter pylori* infection in Abdi Waluyo hospital between January 2017 – December 2019 was 20.98% with endoscopic findings as follows: 17.48% with gastritis, 3.24% with gastric ulcers , 0.26% with gastric cancer.

In 2017, there were prevalence of 6.45% *Helicobacter pylori* infection patients with endoscopic findings as follows: 4.84% with gastritis, 1.61% with gastric ulcers, 0% with gastric cancer. In 2018, there were prevalence of 17.57% *Helicobacter pylori* infection patients with endoscopic findings as follows: 12.13% with gastritis, 5.02% with gastric ulcers, 0.42% with gastric cancer. In 2019, there were prevalence of 36.49% *Helicobacter pylori* infection patients with endoscopic findings as follows: 32.98% with gastritis, 3.16% with gastric ulcers, 0.35% with gastric cancer.

**Table 1. Gender distribution of patients with positive urea breath test (UBT) in Abdi Waluyo Hospital**

Year	Gender	Total number tested	Total number urea breath test (UBT) positive/n (%)
2017	Male	127	10 (7.87)
	Female	122	6 (4.92)
2018	Male	131	25 (19.08)
	Female	108	7 (15.74)
2019	Male	111	43 (34.13)
	Female	137	60 (34.86)

Total number tested male from are 369, with total number of UBT positive is 78 (21.1%). Total number tested female are 367, with total number of UBT positive is 73 (19.8%)

**Table 2. Age distribution of patients with positive urea breath test (UBT) in Abdi Waluyo Hospital**

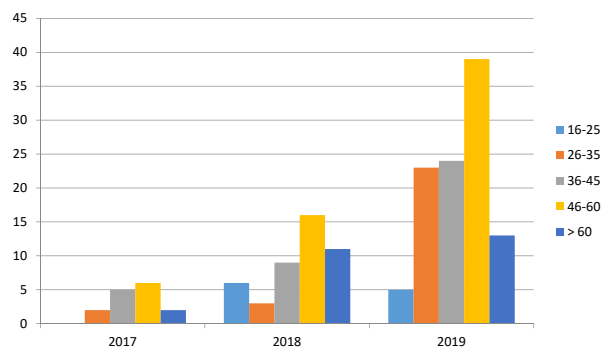
Year	Age (years)	Number tested	Total number urea breath test (UBT) positive
2017	16-25	14	0
	26-35	37	2
	36-45	61	5
	46-60	98	6
	> 60	38	2
	<b>Total number tested</b>		<b>248</b>
2018	16-25	15	6
	26-35	29	3
	36-45	63	9
	46-60	81	16
	> 60	51	11
	<b>Total number tested</b>		<b>239</b>
2019	16-25	19	5
	26-35	50	23
	36-45	50	24
	46-60	107	39
	> 60	58	13
	<b>Total number tested</b>		<b>284</b>

**Table 3. Prevalence of patients with positive urea breath test (UBT) in Abdi Waluyo Hospital**

Year	Total number tested	Total number urea breath test (UBT) positive/ n (%)
2017	248	16 (6.45)
2018	239	42 (17.57)
2019	285	104 (36.49)

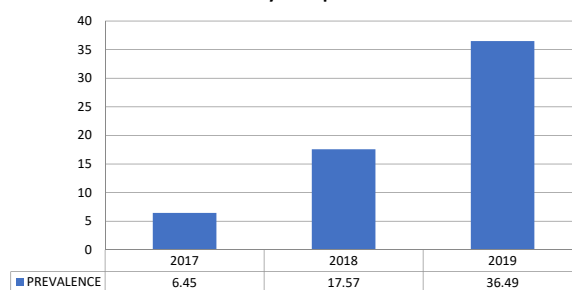
**Table 4. Endoscopic findings prevalence of patients with positive urea breath test (UBT) in Abdi Waluyo Hospital**

Year	Gastritis	Gastric ulcer	Gastric Ca
2017	4.84%	1.61%	0%
2018	12.13%	5.02%	0.42%
2019	32.98%	3.16%	0.35%



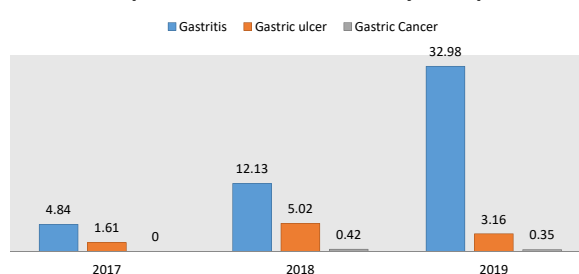
**Figure 1. *H. pylori* positive results by age group. Percentage of urea breath test (UBT) positive individuals across age ranges spanning 16-25, 26-35, 36-45, 46-60, >60**

**The Prevalence of patient with positive UBT in Abdi Waluyo Hospital**



**Figure 2. The Prevalence of patient with positive UBT in Abdi Waluyo Hospital, 2017 – 6,45%; 2018 = 17, 57%; 2019 = 36,49%.**

**Endoscopic findings prevalence of patients with positive UBT in Abdi Waluyo Hospital**



**Figure 3. Endoscopic findings prevalence of patients with positive urea breath test (UBT) in Abdi Waluyo Hospital**

## DISCUSSION

The main finding of our study are that more males with UBT positive than females. Most of *H.pylori* related disease are associated with male sex. This finding is inline with most of studies In Metaanalysis of large, population based studies, de Martel and Pasonnet analysed the role of gender as a risk factor for *H. pylori* infection.<sup>8</sup>

Otherwise, the study from Moshkowitz et al (2012) give the different result .There are more females UBT positive than the male, The difference between the total positive rate among females and males (34.8% vs. 37.2%) was highly significant (p = 0.0003).<sup>8</sup> Khalid

et al showed an effect of female hormone based on the ovarian cancer and polycystic ovarian syndrome induced gastric cancer and colleagues, have shown that there are gender differences in the magnitude of the gastric cytokine response to *H. pylori*.<sup>9</sup> But the higher positive result in male population is still debated, since UBT measures the amount of labeled CO<sub>2</sub> excreted through the lungs in exhaled breath. Thus, beyond the presence of *H. pylori* urease that hydrolyzes the urea into ammonia and labeled CO<sub>2</sub>, factors affecting endogenous production of CO<sub>2</sub> have an impact on UBT quantitative results. Endogenous production of CO<sub>2</sub> depends much on basal metabolic rate, which differs according to sex and body surface area (a function of weight and height). Which it should be higher in man.<sup>10</sup>

Recall that *H. pylori* infection is usually acquired in childhood, with the onset of symptoms and complications usually occurring much later in life. Our data in Figure 1 and Supplementary Table 2 show that the onset of *H. pylori* related disease occurs with significant over-representation of people in the 46–60 age range among those with positive UBT results.<sup>11</sup>

Epidemiological studies in developing countries show that the prevalence of *H. pylori* infection increases with age because of inadequate hygiene, low education level, and low socioeconomic conditions. According to the study from Murat Sadic et al, there were 1,390 cases were *H. pylori*- positive. The rate of UBT positivity was 43% in the pediatric group, 50% in the adult group, and 44% in the geriatric group. The difference was statistically significant between pediatrics and the other age groups ( $p = 0.043$ ). A positive correlation was found between C14- UBT positivity and age ( $r = 0.76$ )<sup>12</sup>

In our study, the prevalence of patient with *H. pylori* positive are increase every year since 2017 to 2019. The rate of Gastritis is significantly increase every year and the rate of gastric ulcer and gastric cancer in patient is fluctuating. There are some factor that may cause the result, based on the study from Ari Fariyal syam from Universitas Indonesia, Jakarta, there were difference of several demographic and environmental factors between ethnic groups; age, religion and the source of drinking water were associated with increased risk of infection. Several ethnics in Indonesia showed the age-related prevalence pattern of *H. pylori* infection in developing countries that *H. pylori* infections occur earlier in life and with high frequency.<sup>13</sup>

In parallel with more effective eradication of *H. pylori*, the prevalence of this infection is changing, and the proportion of ulcers that are not associated

with *H. pylori* infection seems to be increasing. One possible explanation for the increase in urease negative gastric ulcers in our study may be due to the increase in the usage of NSAIDs in the general population. It is well known that NSAID-related GI complications are increasing worldwide.<sup>14</sup>

This study has potential limitation. The effect are based on descriptive study only allow make summations about the prevalence of *Helicobacter pylori* infection in adult patients with dyspeptic symptoms. There are there fore subjects to biases and confounding that may have influenced our study, as its difficult to monitoring the obedience of stop taking any *Helicobacter pylori* sensitive medicine such as antibiotics, bismuth and proton pump inhibitor compound one month before the test since the medicine may affect the test results, and the variety of morphological gastroscopy findings which may be unique and different

## CONCLUSION

Dyspeptic symptoms may associated with gastritis, gastric ulcer and gastric cancer. But its not a definitive association with infection of *Helicobacter pylori*. Further study needed more inclusion and exclusion criteria to rule out other possible causes of gastritis to minimize biases.

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