



## RELATIONSHIP BETWEEN HELICOBACTER PYLORI INFECTION IN TYPE 2 DIABETES MELLITUS PATIENTS BASED ON ANTI IgA AND ANTI IgG HELICOBACTER PYLORI

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### Abstract

#### Background

Helicobacter Pylori (H. Pylori) infection is an infectious disease of the gastrointestinal tract especially the stomach and is currently associated with various systemic disorders in the body, one of which is hormonal disorders. Diabetes mellitus (DM) is an important cause of dyspepsia. Impaired gastrointestinal motor function is now recognized as a major problem in diabetes mellitus. The incidence of H. Pylori is increased in DM. Delayed gastric emptying and dysmotility are important causes of dyspepsia in diabetes.

#### Methods

This study was conducted by cross sectional method. The sample of the study was 39 patients who met the inclusion and exclusion criteria in the General Hospital H. Adam Malik Medan. Anti IgA and anti IgG H. Pylori examination by ELISA method using Chemwell.

#### Results

There were no difference in the incidence of anti IgA H. Pylori positive in patients with controlled DM and uncontrolled DM with  $p=0,431$ . There was no difference in the incidence of anti IgA H. Pylori positive in patients with controlled DM and uncontrolled DM with  $p=0,423$ . However, there were differences in H.Pylori infection in DM patients with dyspepsia and DM patients without dyspepsia with  $p=0.001$ .

#### Conclusion

There were no relationship between H. Pylori infections in patients with type 2 DM.

### Introduction

Helicobacter Pylori infection is an infectious disease of the gastrointestinal tract, especially the stomach and is currently associated with various systemic disorders in the body, one of which is hormonal disorders. About 30-50% of the population worldwide is infected by Helicobacter Pylori. The prevalence of H. pylori infection varies in various countries, in Europe around 7-33%, while in developing countries around 80%. Seroepidemiology studies in Indonesia show a prevalence of around 36-46.1%. (Banner A, 2017; Rani et al 2014).

Helicobacter Pylori (H. Pylori) is a gram-negative spiral bacterium, which colonizes in the stomach. Many studies have proven that H. pylori infection has been strongly associated with gastrointestinal diseases such as chronic gastritis, peptic ulcer disease, gastric cancer, and mucosa-associated lymphoid tissue (MALT) lymphoma since its discovery. (Jun Zhen Li, 2017)

DM is an important cause of dyspepsia. Impaired gastrointestinal motor function is now recognized as a major problem in diabetes mellitus. In addition to diabetes mellitus, H. pylori is also an important cause of dyspepsia. Hyperglycemia can cause infection by H. pylori or the infection can be reactivated and produce dyspeptic symptoms in diabetes. H. Pylori is also considered an important risk factor for both gastric cancer and lymphoma. (Rajesh S, 2017). Controlled and uncontrolled DM was assessed by HbA1c levels. DM is controlled if the HbA1c level is  $\leq 7\%$  and DM is not controlled if the HbA1c level is  $> 7\%$ . (PERKENI 2015).

The diagnostic tools for H. pylori infection are serology, endoscopic biopsy, histopathology, rapid urease test, urea breath test, PCR for H. Pylori DNA, H. Pylori Stool Antigen Test (HPSA). (Zuman R, 2016). Serological



## INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

examination is possible for diagnostic *H. pylori* infection, especially useful for screening. (Zuman R, 2016). Serological examination by examining anti-IgA *H. Pylori* and anti-specific IgG *H. Pylori* has a sensitivity of 91% and specificity 79-83%. (Trochimiak T, 2014).

The purpose of this study was to examine the relationship between *H. Pylori* infection with DM type 2 patients based on anti-IgA and anti-IgG *H. Pylori*.

### Method

This study was an observational study with cross-sectional data collection methods conducted at the Laboratory of Clinical Pathology Department of USU FK / H. Adam Malik Hospital in Medan in collaboration with the Department of Internal Medicine Division of Gastroentero-Hepatology and Endocrine Division of USU / RSUP H. Adam Malik Medan, starting in October 2018 - May 2019. The subjects of this study who met the inclusion criteria (type 2 DM sufferers according to PERKENI 2015 with and without symptoms of dyspepsia who seek treatment at Internal Medicine Clinic of H. Adam Malik General Hospital Medan, DM sufferers aged over 18 years, and willing to participate in the study) and exclusion (patients using NSAIDs, DM patients with other chronic diseases, patients undergoing gastrointestinal surgery, such as gastric resection, patients receiving *H. pylori* eradication therapy) with a sample of 39 people. Anti-IgA examination using Chemwell with ELISA method.

### Results

Of the 39 patients who participated in the study, 22 of the total sample were male (56.4%) and 17 (43.6%) were female. At the initial measurement, the total population of controlled DM was 19 people (48.7%). while the number of uncontrolled DM population is 20 people (51.3%), obtained 26 (66.7%) DM patients with dyspepsia and 13 (3.3%) DM patients without dyspepsia. (Table 1).

*Table 1. Characteristics of Research Subjects*

Variable	N(%)
Gender	
• Men	22 (56,4%)
• Women	17 (43,6%)
Age	
• Men	53 ± 7,33
• Women	48 ± 8.85
DM	
• Controlled	19 (48.7 %)
• Uncontrolled	20 (51.3 %)
DM	
• With dyspepsia	26 (66,7 %)
• Without dyspepsia	13 (3,3 %)

At the initial measurement it was found that the number of population who tested positive for IgA was 14 people (35.9%) while the anti-IgA negative was 25 people (64.1%). Likewise in the measurement of the number of population who tested positive for IgG was 12 people (30.8%), while the total population who tested negative for IgG was 27 people (69.2%). (Table 2).

*Table 2. Characteristics of Immunoglobulin A and Immunoglobulin G H. Pylori Serologic Examination Results*

Immunoglobulin A	Immunoglobulin G	Frequency (%)
Positive	Negative	2 (5,1 %)
Positive	Positive	12 (30,8 %)
Negative	Positive	0 (0 %)
Negative	Negative	25 (64,1 %)

Of all DM patients there were 26 people (66.7%) DM with dyspepsia and 13 people (33.3%) DM without dyspepsia. The incidence of *H. pylori* infection in DM patients with dyspepsia was 14 people (35.9%) and there was no *H. pylori* infection in DM without dyspepsia.



## INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

Phi Cramer test analysis showed that there were differences in H. pylori infection in DM patients with dyspepsia and DM patients without dyspepsia with a value of  $p = 0.001$  ( $p < 0.05$ ). It can be concluded that there is a relationship between H. Pylori infection in DM patients with dyspepsia. (Table 3).

**Table 3. Analysis of the Relationship of H. Pylori Infection in DM Patients with Dyspepsia and without Dyspepsia**

Variabel	Infeksi H.Pylori		P value*
	Negative	Positive	
DM with dispepsia	12 (30.8 %)	14 (35.9 %)	0,001
DM without dispepsia	13 (33.3 %)	0 (0 %)	

\*Significant if  $p < 0,05$

Of the 20 patients with uncontrolled diabetes, there were 6 (30%) positive H. pylori infections and H. pylori negative 14 people (70%). Whereas in 19 patients with Controlled DM the incidence of H. Pylori infection was positive as many as 8 people (42.1%) and H. Pylori negative as many as 11 people (57.9%). Of all patients infected with H. Pylori, 42.9% of patients with uncontrolled DM and 57.1% of patients with controlled DM. Chi Square analysis showed that there was no difference in H. Pylori infection in patients with controlled DM with uncontrolled DM with a value of  $p = 0.431$  ( $p > 0.05$ ). It can be concluded that there is no relationship between H. pylori infection with DM status. (Table 4).

**Table 4. Analysis of the Relationship of H. Pylori Infection with DM Status**

Variable	H.Pylori infection		P value*
	Negative	Positive	
DM uncontrolled	56%	42,9%	0,431
DM controlled	44%	57,1%	

\*Significant if  $p < 0,05$

Of all patients who had positive IgA there were 42.9% of patients with uncontrolled DM and 57.1% of patients with controlled DM. Chi Square analysis showed that there was no difference in the incidence of positive Ig A in patients with controlled DM with uncontrolled DM with  $p = 0.431$  ( $p > 0.05$ ). (Table 5).

**Table 5. Analysis of Relationship between DM Status with Anti-IgA H. Pylori Positive**

Variable	Anti IgA H. Pylori		P value*
	Negative	Positive	
DM uncontrolled	56%	42,9%	0,431
DM controlled	44%	57,1%	

\*Significant if  $p < 0,05$

Of all patients who had positive Ig G, there were 41.7% of patients with uncontrolled DM and 58.3% of patients with controlled DM. Chi Square analysis showed that there was no difference in the incidence of positive Ig G in patients with controlled DM with uncontrolled DM with  $p = 0.423$  ( $p > 0.05$ ). (Table 6).

**Table 6. Analysis of Relationship between DM Status and Anti-IgG H. Pylori Positive**

Variabel	Anti IgG H. Pylori		P value*
	Negative	Positive	
DM uncontrolled	55,6%	41,7%	0,423
DM controlled	44,4%	58,3%	

\*Significant if  $p < 0,05$



## Discussion

This study involved 39 type 2 DM patients who met the study criteria consisting of 22 men (56.4%) and 17 women (43.6%). In contrast to the results of research conducted by Ali SA, et al 2017 obtained as many men and women as suffering from H. pylori infection, which is 60 people (50%) men and 60 people (50%) women. Whereas in the study of Yeniova AO et al 2013, it was found that more women suffered H. pylori infection, 57.7%, while men 42.3%.

Based on gender, women are more often affected by gastritis. This is because women often diet too tight, for fear of being fat, eating irregularly, besides that women are more emotional than men. This bacterium is found throughout the world and correlates with the socioeconomic level of society. The lower the socioeconomic level the higher the prevalence of infection. Improved socioeconomic levels can reduce the prevalence of H. pylori infection. (Nguyen VB, 2015).

Analysis of the Phi Cramer test showed that there were differences in H. pylori infection in DM patients with dyspepsia and DM patients without dyspepsia with a value of  $p = 0.001$  ( $p > 0.05$ ).

In accordance with research conducted by Rajesh et al 2017, among the type II Diabetes group with dyspeptic symptoms, H. Pylori was 71.4% positive, while in the Diabetes group without symptoms of H. pylori dyspepsia was positive as much as 29.6%. In conclusion, Type II Diabetes patients with symptoms of dyspepsia are more vulnerable and at risk of contracting H. pylori infection. Therefore, proper monitoring of blood glucose levels and screening for H. pylori infection are effective for preventative measures for this chronic infection.

Of all patients infected with H. Pylori there were 42.9% of patients with uncontrolled DM and 57.1% of patients with controlled DM. Chi Square analysis showed that there was no difference in H. Pylori infection in patients with controlled DM with uncontrolled DM with a value of  $p = 0.431$  ( $p > 0.05$ ). In accordance with research conducted by Horikawa C et al in 2014, where there were no significant differences in controlled or uncontrolled HbA1c against H. Pylori infection (95% CI: N -0.18 to 0.46), ( $Pv = 0.16$ ). In contrast to research conducted by Joseph Kayat et al in 2014, a significant relationship was found between glycemic control and H. Pylori detection, which found 48.5% of patients with  $HbA1c \leq 7$  in H. Pylori positive ( $p = 0.35$ ), 82.8% of patients with  $HbA1c > 7$  in H. Pylori positive ( $p < 0.05$ ). Research conducted by Dai YN et al in 2015 found H. Pylori infection in patients with high HbA1c (95% CI: 0.07 - 0.79).

Serological blood examination to assess IgG is the most widely used examination of H. pylori infection. This examination is very dependent on the geographical variation of H. pylori bacteria. This examination also has a high false positive rate in patients with a low prevalence of H. pylori infection so it must be confirmed by other examination methods. The good thing is that this examination does not show false negatives in patients taking PPIs or antibiotics or patients with atrophic gastritis, extensive intestinal metaplasia or MALT. This examination is not recommended for children under 8 years because it has not been able to form specific antibodies to the fullest. Other considerations in this examination are its inability to determine acute or chronic infections and sampling methods with consideration of the concentration of H. pylori antibodies found more in urine and saliva than in serum. (Rana R, 2017, Zagari RM, 2015).

## Conclusion

tidak terdapat hubungan antara status DM dengan Infeksi H.Pylori.

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