

Histological Findings Of Helicobacter Pylori In Diabetic Patients

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ABSTRACT

Aim: The aim of this study was to determine the histological findings of H-pylori in diabetic patients.

Material and methods: This observation study was conducted on 90 diabetic patients with H-pylori infection at Gastroenterology Department, Nishtar Medical University, Multan in the duration from November, 2022 to April, 2023. Endoscopic and histological findings were determined. Chi Square test was applied with P value less than 0.05.

Results: The mean age was 53.73±8.66 years with majority male patients. On histological findings chronic gastritis was seen in 74.4%, gastric atrophy 18.9% and intestinal metaplasia 6.7%.

Conclusion: The histological findings of H-pylori in diabetic patients were chronic gastritis 74.4%, gastric atrophy 18.9% and intestinal metaplasia 6.7%.

Keywords: H-pylori, Diabetes, Histological findings, Endoscopy

INTRODUCTION

More than half of the human population has the gram-negative bacteria *Helicobacter pylori* (H. pylori) in their stomachs¹. It has been shown through research that the rate of H. pylori-positive status fluctuates with age, location, living conditions, and socioeconomic position. The most common way for H. pylori to spread is by direct mouth-to-mouth contact. This clarifies why infected family members often include both parents and children². In this approach, it appears that the exchange of utensils while feeding is critical for the establishment of infection³. Inadequate basic sanitation conditions are a leading cause of fecal-oral transmission, which happens when an infected person drinks water that has been contaminated with feces⁴.

Helicobacter pylori has been linked to a variety of autoimmune disorders, including rheumatoid arthritis, thyroiditis, and even diabetes in recent years⁵. *Helicobacter pylori* infection has been linked to metabolic syndrome. *Helicobacter pylori* can cause a reduction in the amount of glucose absorbed in the stomach by stimulating the secretion of gastric antrum secretory hormone⁶. This reduces the effectiveness of absorption of insulin in patients with *Helicobacter pylori*, which in turn affects the metabolic mechanism of blood glucose. Patients with severe illness will have many problems, and the therapeutic result is often not visible⁷. The typical cycle of diabetes is exceptionally long. A problem the avoidance and ongoing health management for patients with diabetes are important because they have been shown to reduce the risk of complications⁸. This includes providing patients with information about diabetes and its treatment, as well as encouraging those at high risk to make lifestyle changes⁸.

There is still debate on whether or not H. pylori infection causes diabetes, despite the fact that several research have drawn that conclusion⁹. Hypothesized causal pathways from H. pylori infection to atherosclerosis, metabolic syndrome, insulin resistance, and type 2 diabetes include alterations in lipid metabolism, which increase atherosclerosis¹⁰. Multiple lines of evidence suggest that diabetic patients may be more vulnerable to H. pylori infection. Susceptibility to H. pylori infection may be heightened due to the decrease of humoral and cellular immunity that diabetes often causes¹¹. The decreased gastrointestinal motility and secretion of acids that may result from diabetes may increase the prevalence of pathogen colonization and infection. Alterations in glucose metabolism may cause stomach mucosal chemistry that favors the colonization of H. pylori¹¹.

H. pylori has been linked to diabetes in a number of studies. Nonetheless, a few studies have found no relationship between diabetes and H. pylori infection rates. To determine the outcome of

this study, we set out to investigate the association between H. pylori infection and diabetes.

MATERIAL AND METHODS

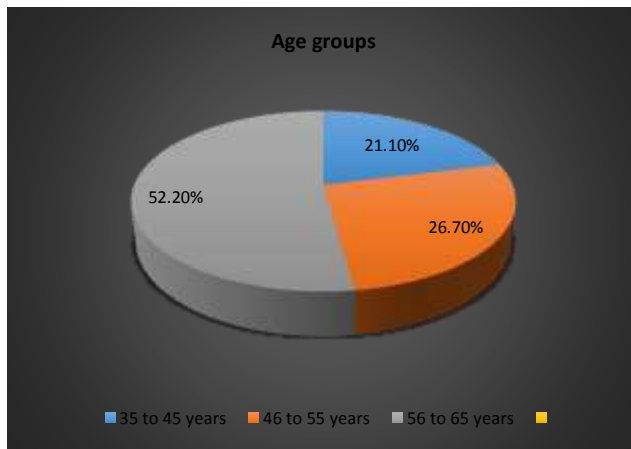
We conducted this observational study at Gastroenterology Department, Nishtar Medical University, Multan in the duration from November, 2022 to April, 2023 after obtaining an ethical clearance certificate from the hospital. We recruited 90 diabetic patients either type 1 or type 2 confirmed by HBA1C test with H-pylori infection, H-pylori infection was screened by stool polymerase chain reaction (PCR) test. Patients were of age 35 to 65 years of either gender. All the patients underwent oesogastroduodenal fibroscopy for endoscopic and histological findings. All the demographic data like age, gender, monthly income and education along with endoscopic and histological findings were recorded on a pre designed pro-forma.

The sample size was calculated with open epi sample size calculator by using previous frequency of gastric atrophy in diabetic patients with H-pylori infection 3.9%, margin of error 4% and confidence interval 95% the calculated sample size was 90.

We assessed and analyzed the data using IBM SPSS-23. Age was analyzed using mean and standard deviation. Frequencies and percentages were evaluated for gender, monthly income, and education, endoscopic and histological findings. Chi Square test was applied for assessing the association between gender and histological findings keeping P values less than 0.05.

RESULTS

This study was conducted on 90 diabetic patients with H-pylori infection. The mean age recorded was 53.73±8.66 years. Gender wise we observed that majority of the patients were male (55.6%) as compared to female patients (44.4%). We observed that majority of the patients had education intermediate and above (34.4%). According to monthly income most of the patients had monthly income > 50000 PKR. The endoscopic findings revealed that hiatal hernia was found in 13.3% patients, esophagitis was found in 12.2% patients, ulcerative gastritis was seen in 26.7% patients and congestive and nodular gastritis was seen in 47.8%. The histological findings were chronic gastritis which was seen in 74.4%. Gastric atrophy was seen in 18.9% patients while intestinal metaplasia was seen in 6.7%. We did not find any significant difference between gender and histological findings (P > 0.05).



Graph 1: Age distribution

Table 1: Demographics

| Demographics | | Statistics |
|----------------|----------------------|------------------|
| Age (Years) | | 53.73±8.66 years |
| Gender | Male | 50 (55.6%) |
| | Female | 40 (44.4%) |
| Education | Illiterate | 17 (18.9%) |
| | Primary | 18 (20%) |
| | Middle | 24 (26.7%) |
| | Intermediate & above | 31 (34.4%) |
| Monthly income | < = 25000 | 23 (25.6%) |
| | 25000 to 50000 | 32 (35.6%) |
| | > 50000 | 35 (38.9%) |

Table 2: Endoscopic findings

| Endoscopic findings | Frequency | Percent |
|----------------------------------|-----------|---------|
| Hiatal hernia | 12 | 13.3 |
| Esophagitis | 11 | 12.2 |
| Ulcerative gastritis | 24 | 26.7 |
| Congestive and nodular gastritis | 43 | 47.8 |
| Total | 90 | 100.0 |

Table 3: Histological findings

| Histological findings | Frequency | Percent |
|-----------------------|-----------|---------|
| Chronic gastritis | 67 | 74.4 |
| Gastric atrophy | 17 | 18.9 |
| Intestinal metaplasia | 6 | 6.7 |
| Total | 90 | 100.0 |

Table 4: Association between gender and histological findings

| Histological findings | Chronic gastritis | Gender | | Total | P value |
|-----------------------|-----------------------|--------|--------|--------|---------|
| | | Male | Female | | |
| Histological findings | Chronic gastritis | 40 | 27 | 67 | 0.37 |
| | Gastric atrophy | 7 | 10 | 17 | |
| | Intestinal metaplasia | 3 | 3 | 6 | |
| Total | | 50 | 40 | 90 | |
| | | 55.6% | 44.4% | 100.0% | |

DISCUSSION

Stomachs are typically teeming with *Helicobacter pylori* (*H. pylori*), a gram-negative spiral bacterium¹³. More over half of the world's population carries the *H. pylori* infection, making it one of the most widespread chronic illnesses.¹⁴ Most cases of peptic ulcer disease are now thought to be caused by *H. pylori*. Studies have also shown that it has links to other serious gastrointestinal conditions that are a global public health issue, such as chronic gastritis, gastric adenocarcinoma, and MALT lymphoma. Some studies have linked *H. pylori* to the onset of conditions outside the digestive system, including cardiovascular disease and metabolic syndrome, in which diabetes plays a major role.¹⁵ Diabetes is the

most common metabolic illness in the world and responsible for roughly 4 million fatalities per year. In 2010, 4.6% of adults worldwide had diabetes; by 2012 that number had increased to 3.71 billion; and by 2030, it was projected to rise to 5.52 billion.¹⁶

H. pylori was already mentioned as a possible factor in the occurrence of diabetes. In 1989, researchers first discovered a link between *H. pylori* infection and type 2 diabetes¹⁷. It has been suggested that the *H. pylori* may be contributing to the occurrence of cardiovascular disease and diabetes through elevations in inflammatory cytokines levels such as C-reactive protein (CRP) and interleukin-6. In general, various studies have investigated the role of *H. pylori* in the pathogenesis of diabetes and its complications, but the results are inconsistent with each other.¹⁸ Patients with diabetes have been found in several case-control studies to have a greater prevalence of *H. pylori*. *H. pylori* has been linked to an increased risk of diabetes in several cross-sectional studies. Nonetheless, a few studies have found no correlation between diabetes and *H. pylori* infection rates.¹⁹

We conducted this study on 90 diabetic patients presenting with *H. pylori*. Majority of the patients were presented with Type 2 diabetes. Male predominance was observed while majority of the patients belonged to the age group of 56 to 65 years. Similar to our findings a study¹² revealed that majority of the patients in their study were males as compared to female while 55 to 65 years age group had the highest number of patients and type 2 was the most frequent type of diabetes.

Regarding the endoscopic findings we found that congestive and nodular gastritis were the most common findings which were present in 47.8% patients. Ulcerative gastritis was found in 26.7% patients while esophagitis and hiatal hernia were found in 12.2% and 13.3% patients. Our results are in line with the aforementioned study which also reported that congestive and nodular gastritis were the most common finding followed by ulcerative gastritis.¹²

Regarding the histological findings we found that chronic gastritis was present in 74.4% patients while gastric atrophy was 18.9% and intestinal metaplasia was 6.7%, similar findings were observed in the aforementioned study¹², they reported that majority of the diabetic patients in their study had chronic gastritis on histological findings followed by gastric atrophy.

CONCLUSION

From our study we conclude that the histological findings of *H. pylori* in diabetic patients were chronic gastritis (74.4%) followed by gastric atrophy (18.9%) and intestinal metaplasia (6.7%).

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