

Association Between Helicobacter pylori Infection and Nonalcoholic Fatty Liver Disease (NAFLD): A Cross-Sectional Study

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ABSTRACT

Background: In patients with gastrointestinal symptoms Helicobacter pylori has been known to cause non alcoholic fatty liver disease. However, there is still gap in literature regarding it in our local clinical setting population.

Objective: The study aims to determine association between Helicobacter pylori Infection and Nonalcoholic Fatty Liver Disease

Materials & Methods: The cross-sectional study was done on 100 patients at the MMC General Hospital, from January 2022 to June 2022. Participants with both abdominal ultrasound (US) for diagnosing fatty liver disease and stool antigen for the detection of H. pylori infection were included. The pros and cons as well as rationale of the study were clearly explained to the participants with an option to withdraw from the study if needed. The data analysis was done by SPSS version 25.

Results: Among cases 15(30%) patients were male and 35(70%) were female while among controls 16(32%) were male and 34(68%) were female. Among cases 35(70%) patients and among controls only 18(36%) participants were positive for H-Pylori. Frequency of H-Pylori infection was significantly higher among cases as that of controls. i.e. 70% vs. 36%, p-value<0.001 Odds ratio of 4.14 shows that among cases risk of H-pylori infection was 4.14 times higher as compared to controls. Data entry and analysis was done with SPSS version-25. Quantitative variables were presented with mean±SD and qualitative variables with frequency and percentage. Frequency of H-Pylori was compared among cases and controls with Chi Square test.

Conclusion: There is an association between NAFLD and Hpylori indicating the need for regularly screening such patients.

Keywords: NAFLD, H Pylori

INTRODUCTION

Nonalcoholic fatty liver disease (NAFLD) is a part of metabolic syndrome and has been reported to cause devastating sequelae.¹ It has been associated with high cholesterol levels in the blood and is a repeated finding especially in people over the age of 40 and type 2 diabetics. There has been a linkage between obesity and NAFLD with large proportion of patients having waist circumference larger than normal.²

Helicobacter Pylori is considered to be a bug but it has its own way of causing detrimental effects.³ The most common and hazardous outcome is gastritis or peptic ulcer disease in which the patients presents with agonizing pain long with hematemesis and melena.⁴ If left untreated it can lead to gastrointestinal lymphoma as well and that's why experts try different therapies for its eradication.⁵ The prevalence of thus is quite high in Pakistani population and that's why it's a common clinical practice to test for it in suspected patients with stool antigen test which is non invasive and has excellent sensitivity of over 95%.⁶

While NAFLD has been found to associated with hypertriglyceridemia, obesity, type 2 diabetes and even hyperuricemia as well, recent literature has shown increased positivity rate of helicobacter pylori, this relationship needs more elaboration and validation in our local context.⁷ The general practitioners have been testing for it in gastroesophageal reflux disease which according to guidelines is a futile exercise.⁸ This study will be of great help to physicians in general and gastroenterologists in particular for formulating guidelines for testing Helicobacter Pylori as both of them are clinically important entities

MATERIALS& METHOD

The cross-sectional study included patients come at the MMC General Hospital, from February 2022 to July 2022. Total sample size was 100 and method was non probability convenient sampling. The pros and cons as well as rationale of the study were clearly explained to the participants with an option to withdraw from the study if needed. The helicobacter test was done by stool antigen test and fatty liver was done by Ultrasound Abdomen

Sample Size: Sample size for 50 cases was calculated with the following parameters. i.e. 90% confidence level, 9% margin of error and by taking expected percentage of NAFLD in H-pylori positive patients as 18%. Following formula was used for sample size calculation. For comparison we took 50 controls as well so total sample size was 100. i.e. 50 cases and 50 controls.

$$n = \frac{z_{1-\alpha/2}^2 P(1-P)}{d^2}$$

Reference for sample size calculation: Zhao XX, Wang RL, Liu MH, Huang XJ. Is the Occurrence or Reversal of Nonalcoholic Fatty Liver Disease Associated with Long-Term Helicobacter pylori Infection among Chinese Adults? A Cohort Study. Gastroenterology Research and Practice. 2021 Nov 24;2021.

Data Analysis: Data entry and analysis was done with SPSS version-25. Quantitative variables were presented with mean±SD and qualitative variables with frequency and percentage. Frequency of H-Pylori was compared among cases and controls with Chi Square test. Odds ratio was calculated to see the risk of H-Pylori infection among fatty liver disease patients as that of controls. Odds ration >1 considered significant risk. p-value <0.05 was considered statistically significant.

RESULTS

Table-1: Patients Characteristics among Cases and Controls

	Cases (n=50)	Controls (n=50)
Age (Mean±SD)	45.54±10.76	39.90±14.38
Gender (Male/Female)	15/35 [30%/70%]	16/34 [32%/68%]
Ultrasound Findings		
Fatty Liver Disease	50(100%)	0(0%)
Normal	00(0%)	50(100%)

In this study we included 50 cases and 50 controls. Cases were patients who were diagnosed with fatty liver disease on ultrasound and controls were normal without having fatty liver disease. Mean age of cases and controls was 45.54±10.76 and 39.90±14.38. Among cases 15(30%) patients were male and

35(70%) were female while among controls 16(32%) were male and 34(68%) were female. **(Table-1)**

Table-2: Pylori among Cases and Controls

	Cases	Controls	Total
H-Pylori (+)	35(70%)	18(36%)	53
H-Pylori (-)	15(30%)	32(64%)	47
Total	50	50	100
Odds Ratio	4.14 (1.79-9.57)		
p-value	<0.001		

Among cases 35(70%) patients and among controls only 18(36%) participants were positive for H-Pylori. Frequency of H-Pylori infection was significantly higher among cases as that of controls. i.e. 70% vs. 36%, p-value<0.001 Odds ratio of 4.14 shows that among cases risk of H-pylori infection was 4.14 times higher as compared to controls.

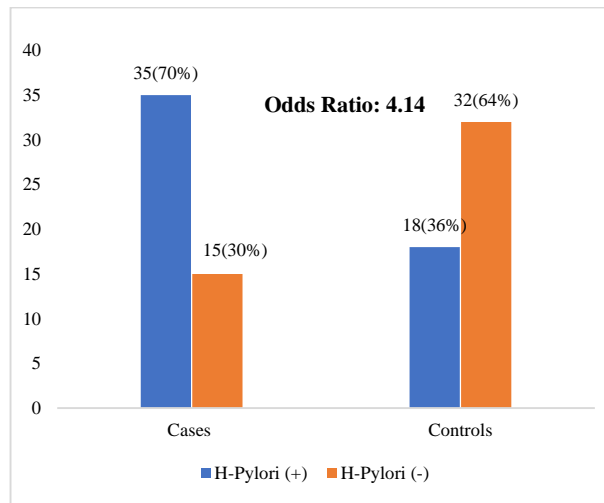


Figure-1: H-Pylori among Cases and Controls

DISCUSSION

The presence of NAFLD has been recognised for causing upper GI tract symptoms as reflected by the results of the study .⁹According to this study there was significant association helicobacter pylori and NAFLD. Among cases 35(70%) patients and among controls only 18(36%) participants were positive for H-Pylori. Frequency of H-Pylori infection was significantly higher among cases as that of controls. i.e. 70% vs. 36%, p-value<0.001 Odds ratio of 4.14 shows that among cases risk of H-pylori infection was 4.14 times higher as compared to controls.

According to one of the systemic review published in 2018 derived from various studies Helicobacter Pylori was significantly associated with NAFLD as reflected by odd ratio 1.21 with significantly enhanced risk of it among positive patients as proven by metaanalysis .¹⁰Further studies are needed that how this can

be assessed in the clinical context was the main recommendation of the study further justifying our rationale for research.

Another cross sectional study was done in China on a very large sample size of 5665. Interestingly in men the H pylori infection had a significant association with NALFD and enhanced liver stiffness as demonstrated by a p value of less than 0.01 and there was no significant correlation in case of women in the same study giving rise to speculation that probably gender is one of the key factor as contradiction to other studies.¹¹

Baeg et al. also failed to find a relation between H. pylori and NAFLD by doing a study on a sample size of 3,663 South Koreans Even in those studies which did have positive results, the OR values were not significant .So in light of these studies our study will prove a bench mark for further large scale studies to further prove the correlation between H pylori and NAFLD as both are clinically significant disorders with fatal outcomes for the patient.¹¹

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