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Association between H Pylori and Hyperemesis gravidarum: A Cross Sectional Study

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ABSTRACT

Background: Hyperemesis gravidarum (HG), is a condition that is classically manifested by severe nausea and vomiting during pregnancy and affects women in the first trimester. If left untreated it can lead to a large number of complications both for the mother and the foetus.

Objective: To determine the relationship between Helicobacter Pylori induced infection and hyperemesis gravidarum.

Material and Methods: This cross-sectional study was conducted at MMC General Hospital Peshawar from 1st Jan 2021 till 30th June 2021.The sampling technique was non-probability convenient sampling. The inclusion criteria were pregnant women in first trimester aged between18 and 45 years. Patients with molar pregnancy and those having history of gastrointestinal disorders were excluded from the study. A total of 100 patients were taken with 50 fulfilling the criteria for hyperemesis gravidarum and50 normal pregnant women taken controls. A well-informed consent was taken from all the participants and H Pylori test was done by stool antigen. The frequency of H-Pylori was compared in both the groups with Chi Square test. The odds ratio was calculated to see the risk of H-Pylori infection among cases as that of controls. Odds ration >1 and p-value ≤0.05 was considered significant

Results: Mean age of women with and without Hyperemesis Gravidarum was 30.80±5.28 and 30.92±5.25 years respectively. Mean weight of these women was 59.52±9.06 and 60.42±7.40 kg. Mean gestational age of women with and without Hyperemesis Gravidarum was 13.36±3.95 and 13.56±3.18 weeks respectively. The frequency of H-Pylori infection was significantly higher among cases as compared to controls. i.e. Cases: 78% vs. Controls: 32%, p-value<0.001. The risk of H-Pylori infection increases 7.53 times higher among women with Hyperemesis Gravidarum than those without it

Conclusion: This study proved that there was positive correlation between H pylori and hyper emesis gravidarum patients.

Keywords: Helicobacter Pylori Infection, Hyperemesis

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INTRODUCTION

Hyperemesis gravidarum (HG), is a condition that can result in gastrointestinal symptoms like dyspepsia, vomiting with loss of weight and affects 32% of women in pregnancy.[1] It can lead to dehydration, problems, ketone bodies in blood and urine and imbalance in electrolytes level causing liver and kidney damage.[2] The condition erupts in early course of pregnancy between 4 and 9 weeks reaching at its peak at 1215 weeks, and then starts resolving around week 20. However, a considerable number (920%) of patients have persistent symptoms till the very end of the pregnancy.[3] It does affect a small proportion of live births and most common reason for hospital admission during first 3 months of pregnancy and does impact the quality of life .It has a variety of life threatening consequences like encephalopathy, derangement in clotting factors, depression, and hazardous results like premature babies, underdeveloped foetuses, and foetal anomalies.[4] A number of etiological factors are responsible for hyperemesis.[1]Some research has recommended that Helicobacter pylori infection testing is a prerequisite in hyperemesis gravidarum patients.[5]One explanation is that reduction information of gastric acid in first trimester arising from an rise in the body ?uid, immune system dysfunction and alteration in steroid hormones can cause activation of H. pylori infection, and thus causing irritating gastrointestinal symptoms.[6]

H Pylori and its prevalence differ in various countries governed by geographical locations and socioeconomic status. Different explanations have been proposed to explain the relationship between H. pylori and its disastrous effects during pregnancy. In the past studies have recommended mandatory testing of H Pylori infection to rule it out as a cause of anaemia in pregnancy.[7] Treating H. pylori infection is extremely important but at same time testing it first has a lot of significance.[8]

Well there are studies for gastrointestinal manifestations of hyperemesis gravidarum and its possible consequences; literature is still deficient about the proportion of patients positive for H pylori as an etiological factor for it. It essential to

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determine its relationship with pregnancy induced vomiting as that could help to determine the appropriate treatment and hence improve the clinical conditions of patients.[4] The objective of this study was to determine the relationship between H. pylori induced infection and hyperemesis.

MATERIAL AND METHODS

This cross-sectional study was done on 100 patients at MMC General Hospital Peshawar. The sample size was calculated by using prevalence of H pylori as 64.4% with 10% margin of error and 95% confidence interval The study duration was 6 months after the approval of proposal by ERB letter dated 20-12-2020.The sampling technique was probability convenient sampling. The inclusion criteria were pregnant women in first trimester aged between18 and 45 years. Hyperemesis gravidarum can be defined as intractable vomiting associated with loss of more than 5% of pre pregnancy weight, dehydration, electrolyte disturbances, or need for hospital admission.[9] Patients with molar pregnancy and those having history of gastrointestinal disorders were excluded from the study. The rationale of the study was clearly explained to the participants and well-informed consent was taken. Patients did have routine antenatal investigations like Ultrasound. Stool antigen test was used being non-invasive for detection of H Pylori performed by LIAISON XL analyser. The stool antigen test detects the antigen of the bacterium, as opposed to the antibodies developed as a result. A stool antigen test checks to see if substances that trigger the immune system to fight an H. Pylori infection (H. Pylori antigens) are present in the stool. It is capable of diagnosing an ongoing infection, whereas the serological testing merely diagnoses contact with the bacterium. The last menstrual period confirmed by an ultrasound. After the data collection the analysis was done with SPSS version 22. Quantitative variables were presented with mean±SD and qualitative variables in form of frequencies and percentages. The frequency of H-Pylori was compared in both the groups with Chi Square test. The odds ratio was calculated to see the risk of H-Pylori infection among cases as that of controls. Odds ration >1 and p-value $\leq$0.05 was considered significant.

RESULTS

Mean age of women with and without Hyperemesis Gravidarum was 30.80±5.28 and 30.92±5.25 years respectively. Mean weight of these women was 59.52±9.06 and 60.42±7.40 kg. Mean gestational age of women with and without Hyperemesis Gravidarum 13.36±3.95 and 13.56±3.18 weeks respectively. No significant difference was seen for age (p-value=0.910), weight (p-value=0.588), gestational age (p-value=0.781) and parity (p-value=0.453) of women with and without Hyperemesis Gravidarum. Among cases and controls 38% and 24% women were primiparous. (Table 01)

Table 01. Patients Characteristics in Study Groups

		Hyperemesis Gravidarum		p-value
		Cases (+)	Controls (-)	
		50	50	
Age		30.80±5.28	30.92±5.25	**0.910**
Weight		59.52±9.06	60.42±7.40	**0.588**
Gestational Age		13.36±3.95	13.56±3.18	**0.781**
Parity	**1**	19(38%)	12(24%)	**0.453**
	2-3	23(46%)	26(52%)	
	4-5	7(14%)	10(20%)	
	>5	1(2%)	2(4%)	
H-Pylori	**Positive**	39(78%)	16(32%)	**<0.001**
	Negative	11(22%)	34(68%)	

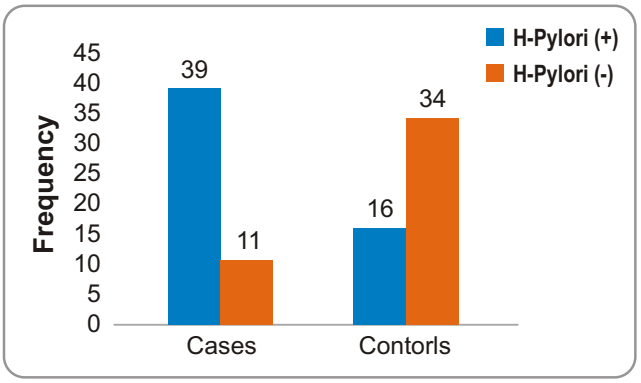


Figure 1. Association of H-Pylori Infection with Hyperemesis Gravidarum

The graph shows that frequency of H-Pylori infection was significantly higher among cases as compared to controls. i.e. Cases: 78% vs. Controls: 32%, p-value<0.001.

The odds of H-Pylori infection increases 7.53 times higher among women with Hyperemesis Gravidarum as that of women without Hyperemesis Gravidarum.

Table 02. Infection H-Pylori among Cases and Controls Stratified for Patients Characteristics

	H-pylori	Hyperemesis Gravidarum		P-value
		Cases (+)	Cases (+)	
Age (Year)				
18-25	Positive	5(83.3%)	0(0%)	0.003
	Negative	1(16.7%)	6(100%)	
26-30	Positive	18(78.3%)	10(41.7%)	0.011
	Negative	5(21.7%)	14(58.3%)	
31-35	Positive	14(73.7%)	5(29.4%)	0.008
	Negative	5(26.3%)	12(70.6%)	
>40	Positive	2(100%)	1(33.3%)	0.136
	Negative	0(0%)	2(66.7%)	
Parity				
1	Positive	15(78.9%)	5(41.7%)	0.035
	Negative	4(21.1%)	7(58.3%)	
2-3	Positive	20(87%)	9(34.6%)	<0.001
	Negative	3(13%)	17(65.4%)	
4-5	Positive	3(42.9%)	1(10%)	0.116
	Negative	4(57.1%)	9(90%)	
>5	Positive	1(100%)	1(50%)	0.386
	Negative	0(0%)	1(50%)	
Gestational Age (Weeks)				
6-10	Positive	9(75%)	3(42.9%)	0.161
	Negative	3(25%)	4(57.1%)	
11-15	Positive	20(83.3%)	9(32.1%)	<0.001
	Negative	4(16.7%)	19(67.9%)	
16-20	Positive	10(71.4%)	4(26.7%)	0.027
	Negative	4(28.6%)	11(73.3%)	

Except age group >40 years frequency of H-Pylori infection was significantly higher in all age groups among cases as compared to control. i.e. 18-25 years: 83.3%, 26-30 years: 78.3%, 31-35 years: 73.3% and >40 years: 100%. For parity women with parity 1 and 2-3 had significantly higher frequency of H-Pylori infection as compared to that of control group. However, women higher parity did not show statistically significant difference for H Pylori infection among cases and control. (Table 02)

DISCUSSION

The frequency of H-Pylori infection was significantly higher among cases as compared to controls. i.e. Cases: 78% vs. Controls: 32%, p-value<0.001. Risk of H-Pylori infection increases 7.53 times higher among women with Hyperemesis Gravidarum as that of women without Hyperemesis Gravidarum. The frequency of H-Pylori infection was significantly higher in all age groups among cases as compared to control. I.e. 18-25 years: 83.3%, 26-30 years: 78.3%, 31-35 years: 73.3% and >40 years: 100%. No significant difference was seen for age (p-value=0.910), weight (p-value=0.588), gestational age (p-value=0.781) and parity (p-value=0.453) of women with and without hyperemesis gravidarum.

The results of this study are quite similar to another study which came to a conclusion that pregnant women with H. pylori presented with vomiting in 64.4% of patients.[10] The frequency of *H. pylori* in the present study (68.25%) which was more, compared to of other studies with a 68.8% infection rate. In addition, a study conducted in Addis Ababa mentioned the infection rates of 30.8% and 34.1% in primigravida and multigravida women, respectively.[10] The findings of studies previously performed in Turkey showed prevalence rates of pregnant women with H. pylori infection were 56.8% and 61.5% in 2007 and 2006, respectively.[8]

Helicobacter Pylori has slow growth and is relatively motile with gram-negative characteristics, forming colonies the gastric mucosa. It has been reported to be present in 40% adult population in well-developed countries and is one of the main culprits for peptic ulcer beside Non-Steroidal anti-inflammatory drugs.[11] The speculation that H. Pylori infection may precipitate hyperemesis gravidarum in pregnant women arose from the detection of a higher H. Pylori IgG titres in the pregnant women with hyperemesis gravidarum, compared to patients without symptoms in certain trials.[12] A few trials supporting this hypothesis reported a remarkable improvement in clinical symptoms when drugs such as erythromycin was given in patients with serious hyper emesis needing intravenous fluid treatment.[13]

Similarly, different trials were published reporting a massive improvement in the clinical condition after being given antibiotics with proton-pump inhibitors or antacids for 2 weeks in patients with diagnosis of hyper emesis .Karaca C et al. reported that H. Pylori IgG was higher pregnant ladies with hyper emesis and that a low socioeconomic level was one of the major factors for H. Pylori infection in pregnant women with hyperemesis gravidarum.[14]

Though the use of clarithromycin isn't recommended in pregnancy, agents such as amoxicillin and metronidazole can be given for the eradication of H Pylori, but the efficacy isn't that great, The American Disease Control and Prevention Centre has recommended that metranidazole can be given in the 1st trimester.[15] A reasonable alternative treatment is simultaneous administration of amoxicillin and omperazole; however, there are not effective and have inferior rates for H Pylori eradication.[16] Consequently, although H. Pylori is the major culprit in the causation of hyperemesis, safest therapeutic choices are still a big question mark. The use of antibiotics should judicious as there is high rate of resistance.[17]So, the future research should stress upon identifying the effective therapies for H Pylori eradication that can have a positive impact on the patients with hyperemesis gravidarum and its potential complications.[18] But due to multiple microbial resistance , highly sensitive tests such as stool antigen tests should be used to confirm eradication.[19]

Strengths&Limitations:

The main strength of this cross-sectional study that it was relatively quick and inexpensive to conduct. Since the sample size was small, more studies are needed to generalize these results.

CONCLUSION

This study proved that there was positive correlation between H pylori and hyper emesis gravidarum patients.

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AUTHOR'S CONTRIBUTION

The following authors full fill authorship criteria as per ICMJE guidelines;

Ayub JU, Qaisar A:	Substantial contribution to conception and design, drafting the manuscript, final approval, agreed to be accountable for all the work.
Shah AZ, Amin S:	Substantial contribution to conception and design, data acquisition, drafting the manuscript, final approval, agreed to be accountable for all the work.
Fayaz H:	Analysis and interpretation of data, drafting the manuscript, final approval, agreed to be accountable for all the work.
Khan UA:	Analysis and interpretation of data, critical revision,final approval, agreed to be accountable for all the work.