



Research Article

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# *Helicobacter Pylori* Infection in Cases of Hyperemesis gravidarum; Updates



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## Abstract

**Background:** One of the serious problem affecting pregnant females is Hyperemesis gravidarum. Different theories were suggested. But the main etiology is still unknown

**Objectives:** To determine the incidence of *Helicobacter pylori* infection in cases of hyperemesis gravidarum.

**Patients and methods:** case control study of 80 cases (40 case of HEG) and (40 case of normal pregnant females. Determination of *Helicobacter pylori* antibodies were done in serum and stool for the two studied groups.

**Results:** 75% of cases of HEG were positive of *Helicobacter pylori* in stool samples and 37.50% of normal pregnant females. These results were statistically significant ( $p=0.001$ ). The prevalence of HplgG AB and HpSAB was 77.5% in the patients group with HEG, and 55.0% in control studied group ( $P=0.05$ ). There was a significant difference between HEG cases and normal pregnancy as regards serum sodium (0.042).

**Conclusions:** Infection by *helicobacter pylori* may be one of the risk factors for HEG. *Helicobacter pylori* AB in both serum and stool is higher in HEG cases than in normal pregnant females.

**Keywords:** HEG; *H. Pylori*; Pregnancy

## Introduction

Approximately 50% of pregnant women suffer from nausea and vomiting. And in about of 80% these symptoms begin between the 4<sup>th</sup> and 7<sup>th</sup> week after the last menstrual period [1].

On the other side, one of the complications occurring during pregnancy is Hyperemesis gravidarum (HG). Its symptoms include intractable nausea, vomiting, and dehydration and occur in 0.5-2.0% of pregnant women [2,3] usually in the 1<sup>st</sup> trimester [4]. In case of severe or inadequately treated hyperemesis gravidarum, another symptoms may be appear such as: [2] Loss of 5% or more of pre-pregnancy body weight, Dehydration, causing ketosis [4] and Metabolic imbalances which may results in metabolic ketoacidosis [2].

The etiology of HG is most likely to be multifactorial. Women with HG are more likely to be younger, primiparous and with Female infant sex while Body mass index, smoking, socioeconomic status and Paternal genes didn't not affect the occurrence of HG [5].

*Helicobacter pylori* which is also named Campylobacter pylori, is a Gram-negative, microaerophilic bacterium found in the stomach, and may be in other parts of the body, such as the eye [6,7].

Nashaat et al. [8] suggested that hyperemesis gravidarum may be caused due to chronic infection with *Helicobacter pylori* [8]. On the other hand some researchers failed to assign a relation between the onset and the chronicity of the infection and the occurrence and the severity of HG [9].

Our objectives were to determine the possible relationship between *Helicobacter pylori* infection and the occurrence of HG in pregnant women during the first three month of pregnancy.

## Materials and Methods

This study was approved by national research ethics committee and was performed according to the ethical standards shown in the 1964 Declaration of Helsinki and its comparable ethical standards.

**Informed consent**

Written informed consent was obtained from all women included in the study. It is a case control study carried out on 80 pregnant females attending the antenatal care clinic of El Shat by Maternity University Hospital in the period from April 2015 till March 2016.

They were divided into two studied groups:

**Group 1:** Forty (50%) pregnant females complaining of hyperemesis gravidarum (cases) and group 2: Forty (50%) normal pregnant females (controls).

**Inclusion criteria:** all pregnant women included in the study were pregnant with gestational age from 5 to 15 weeks and complaining from symptoms of severe vomiting ( $\geq 3$  times a day) not responding to traditional treatments, weight loss ( $\geq 5\%$  of body weight); hyperemesis gravidarum and presence of ketonuria. While the control group were pregnant women with the same gestational age but without manifestation of HG. Both groups in the study were comparable as regards age, obstetric history, and gestational age.

**Exclusion criteria:** Patients with history of thyroid disorders, multiple pregnancy, psychological diseases, gestational trophoblastic disorders, hepatobiliary disorders and gastric or any intestinal disease.

Women eligible for the study were informed about the nature of the study before blood samples and stool specimens were taken.

**Assessment of serum H pylori IgG antibody**

Samples were obtained by venous blood sample and centrifuged at 3000rpm for 10 minutes. Serum was stored at -30 °C till the analysis. H pylori IgG antibody (HpIgGAb) was assessed by enzyme-linked immunosorbent assay (ELISA) kits. Results were measured by BioTek ELx 800 ELISA reader. Results were assigned as positive, negative, and equivocal. The lower limit for a "positive" result was  $\geq 1.00$  and  $\leq 0.9$  as a negative test. Values ranging from 0.91–0.99 was assigned as equivocal.

**Determination of h pylori stool antigen**

Stool samples from each woman were put into clean cups and stored at -30 °C until assessment. All stool samples were assessed for H pylori stool antigen (HpSA) by HpSA enzyme-linked immune sorbent assay (Diagnostic Bio Probersrl, Milano, Italy) according to the manufacturer's manual. positive result was considered as any value  $\geq 0.298$  at optical density of 450nm and negative results were  $< 0.298$ .

**Statistical analysis of the data**

Data were introduced to the computer and processed using IBM SPSS software package version 20.0. Qualitative data were presented using number and percentage. Quantitative data were presented using range (minimum and maximum),

mean, standard deviation and median. 5% level was chosen as Significance for results.

We used the following statistical tests:

- A. Chi-square test: in categorical variables
- B. Monte Carlo correction: Correction for chi-square when more than 20% of the cells have expected count less than 5
- C. Student t-test: in normally quantitative variables.
- D. Z for Mann Whitney test: in abnormally quantitative variables.

**Results**

Forty (50%) pregnant females complaining of hyperemesis gravidarum (cases) and forty (50%) normal pregnant females (controls) were enrolled in the study during the period from April 2015 till March 2016. There was no cancelled or dropped cases from the study.

The ages of the women in both groups ranged from 20 to 35years, they were more or less matched for age;the mean age of patients was  $27.50 \pm 4.66$  while that of the controls was  $26.95 \pm 4.71$  (Table 1).

**Table 1:** Comparison between the two groups according to demographic data.

	Cases (n = 40)	Control (n = 40)	T	P
Age (years)				
Min.-Max.	20.0–35.0	20.0–35.0	0.525	0.601
Mean±SD.	27.50±4.66	26.95±4.71		
Median	27.5	26.5		
Weight (kg)				
Min.-Max.	42.0–74.0	57.0–83.0	5.461*	<0.001*
Mean±SD.	60.40±10.45	71.70±7.88		
Median	59.5	73.5		

T: Student t-test

\*: Statistically significant at  $p \leq 0.05$

Body weight was significantly lower among patients as compared to controls (Table 1). There was no significant difference between patients and controls according to obstetric history; gravidity, parity and abortion.

A significant difference between patient and controls according to vital signs including systolic blood pressure, diastolic blood pressure, and pulse rate (Table 2).

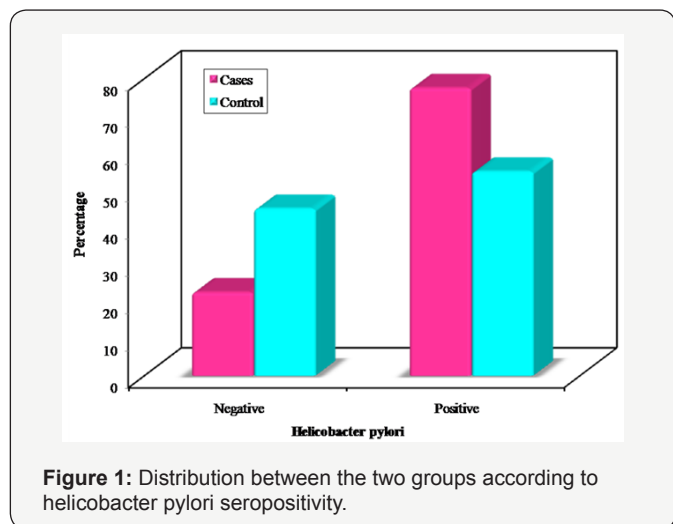
**Table 2:** Comparison between the two groups according to vital signs.

	Cases (n = 40)	Control (n = 40)	T	P
Systolic				
Min. – Max.	80.0 – 100.0	100.0–130.0	13.933*	<0.001*
Mean±SD.	89.13±6.97	116.0±10.01		
Median	90	117.5		
Diastolic				
Min. – Max.	50.0–75.0	70.0–80.0	9.985*	<0.001*
Mean±SD.	60.75±7.81	75.0±4.53		
Median	60	75		
Pulse				
Min. – Max.	75.0–96.0	71.0–84.0	7.862*	<0.001*
Mean±SD.	86.45±7.32	76.52±3.19		
Median	87.5	76		

t: Student t-test

\*: Statistically significant at  $p \leq 0.05$

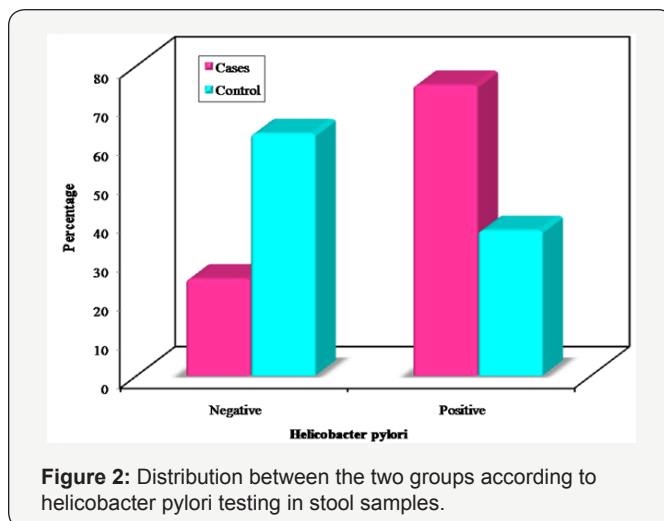
*H. pylori* stool antigen (HpSA) was 77.5% (31 of 40) in the patients with HEG, and 55.0% (22 of 40) in controls ( $P=0.05$ ;  $\chi^2=4.528$ ). These results are considered as significant one Figure 1.



**Figure 1:** Distribution between the two groups according to helicobacter pylori seropositivity.

*Helicobacter pylori* in stool samples were 30 positive of 40 cases with 75% and 15 positive of 40 controls with 37.50%. These results were statistically significant difference ( $p=0.001$ ) Figure 2.

Regarding the prevalence of *H. Pylori*, it didn't differ with age, gravidity and parity in cases with HEG with positive or negative *helicobacter pylori* infection.



**Figure 2:** Distribution between the two groups according to helicobacter pylori testing in stool samples.

There was a significant difference between cases with HEG and control groups as regards serum sodium levels while there was no statistical difference as regards serum potassium and serum bilirubin (Table 3).

**Table 3:** Serum sodium , potassium and total serum bilirubin levels in the cases and the control Z: Z for Mann Whitney test.

	HEG Cases(n = 40)	Control(n = 40)	Test of sig.	P
Serum sodium				
Meq/L				
Min. – Max.	124–139	129–140	t=0.201	0.042*
Mean±SD.	129.6±6	134±4.15		
Median	128	131		
Serum potassium				
Meq/L				
Min. – Max.	1.5-4.2	3.6 - 5.1	t=0.306	0.052
Mean±SD.	3.2±1.78	4.61±1.45		
Median	2	4		
Serum total bilirubin mg/dl				
Min.-Max.	0.3–2.0	0.2–1.2	t=0.826	0.409
Mean±SD.	0.9±0.48	6±0.31		
Median	1	0.7		

t: Student t-test.

### Discussion

50% of pregnant women suffer from Vomiting, and 25% suffer from nausea [10]. However, only 0.3–1.5 % is the

incidence of HEG [11] its cause is theoretical, and one of its reasons is *Helicobacter pylori* (*H. pylori*). *H. pylori* was first discovered in the stomachs of patients with gastritis and ulcers in 1982 [12]. *H. pylori* is a helix-shaped (classified as a curved rod, not spirochaete) Gram-negative microaerophilic bacterium [13]. This study was targeted to determine the relation between *H. pylori* infection and HEG.

Rate of *H. pylori* sero positivity in hyperemetic patients was significantly higher (77.5%) compared to the control group (55.0%),  $p=0.058$ .

Frigo et al. [14] found that 90.5% of female suffering from HG were positive for serum *H. pylori* A Bif compared to 46.5% of the normal pregnant group. Another study showed that females with HG had positive serum *H. pylori* (HP) AB in 92% of them as and it was 45% in the normal women group [15]. On the other hand two other researchers concluded that there was no correlation between HG and serum *H. pylori* AB, one conducted USA [16] and the other done by Berker et al. [17] from Turkey. Also, Shirin Rafie et al. [18] concluded that there was no association between HEG and H.P sero positivity. Golberg D et al. [19] and Irene Sandven et al. [20] found that there was a positive relation between HG and *H. pylori* seropositivity.

Salimi et al. [21] detect Positive serum *H. pylori* Ig G antibody in 88.9% of the patients in the test group vs. 40.7% of the control group ( $P<0.001$ ). Although more patients with HG were seropositive for *H. pylori* infection than control studied group, The correlation between seropositivity for *H. pylori* and the time of onset or duration of HG symptoms were not able to be demonstrated. Although *H. pylori* infection may be an important factor in causing HG, it may not represent the only cause of the disease.

On the other hand Vikanes et al. [22] reported that *H. pylori* exposure was not significantly associated with severe HG among immigrant women in Norway, By investigating *H. pylori* exposure by IgG seropositivity, VacA and CagA seropositivity or by the detection of *H. pylori* antigens in stool. These results may show a weakness in the association between *H. pylori* and HG previous expectations, especially in populations with high incidence of *H. pylori* infection.

Our results were comparable to the results found in previous studies, and showed that there is an association between HEG and *H. Pylori* infection. *H. pylori* infection is one of the factor that cause GIT disturbance, vomiting, and nausea in general population. But, *H. Pylori* infection determined by the seropositivity for its antibodies is also, prevalent in asymptomatic population as found by Sarker et al. [23] They found the high seroprevalence of vacA- and cagA- positive virulent *H. pylori* strains in an asymptomatic paediatric population indicate that such strains are common in this population and may cause characteristic *H. pylori* infection in Bangladesh. So, geographical distribution, age, general condition of the female and patient susceptibility may

be confounding factors for the associations of *H. pylori* infection with sever HEG cases.

## Conclusion

*H. pylori* infection is conducted with severe form of HEG and may be listed as one of the risk factors for sever HEG.

## Acknowledgement

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## Conflict of interest

There is no conflict of interest

## Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

## Informed consent

Informed consent was obtained from all individual participants included in the study.

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