

# Relation of Helicobacter Pylori and Hyperemesis Gravidarum in sample of pregnant women in Maternity Teaching Hospital of Erbil city

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## Abstract

**Background and objectives:** Nausea and vomiting in early pregnancy are accompanied by great impact on general health status of pregnant women especially if presented as hyperemesis gravidarum. The helicobacter pylori infection is predominant in Iraqi community. The aim of the study is to find out whether sero-positivity for immunoglobulin G antibodies to Helicobacter pylori is related to hyperemesis gravidarum.

**Methods:** A study carried out in Maternity Teaching Hospital in Erbil city, Kurdistan region-Iraq from 1<sup>st</sup> of May, 2019 to 30<sup>th</sup> of April, 2020 on a sample of 80 pregnant women; 40 pregnant women with hyperemesis gravidarum and 40 pregnant women as controls. Diagnosis of hyperemesis gravidarum was done depending on clinical presentations and investigations findings. Serum electrolytes and immunoglobulin G antibody tests were done for the studied women.

**Results:** In the current study, 60% of pregnant women with hyperemesis gravidarum pregnant women had positive immunoglobulin G of Helicobacter Pylori as compared to 35% of control group. The serum levels of sodium, potassium and chloride were significantly lower in 40%, 50% and 25% of pregnant women with hyperemesis gravidarum respectively compared to 10%, 17.5% and 7.5% in control group. Low educational level and socioeconomic status of pregnant women were significantly associated with hyperemesis gravidarum. Hyperemesis gravidarum was more common in pregnant women with normal body mass index.

**Conclusions:** Helicobacter pylori infection is more common in pregnant women with hyperemesis gravidarum. The development of hyperemesis gravidarum in pregnancy leads to obvious electrolyte imbalance.

**Key words:** Helicobacter pylori, Hyperemesis gravidarum, Immunoglobulin G.

## Introduction

The nausea and vomiting are predominantly affecting pregnancies.<sup>1-3</sup> Hyperemesis gravidarum (HEG) is a disease recognized by continuous severe nausea and vomiting of pregnant women that lead to ketosis with prevalence rates reaching to (0.3–2%).<sup>4</sup> It leads to weight loss, nutrients deficiency, dehydration, ketonuria, electrolytes and acid–base imbalance. The common complications of untreated HEG are Wernicke's

encephalopathy, coagulopathy, depression, longer hospital stay and poor pregnancy outcomes like preterm labour, small for gestational age, fetal mal-development and fetal congenital anomalies.<sup>6, 7</sup> The exact etiology of hyperemesis gravidarum is mostly unknown; however, some explanations exist such as hormonal changes, changes in gastrointestinal tract and genetic factors,<sup>8</sup> in addition to other risk factors such as increasing placental

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mass for molar pregnancy or multiple pregnancies, pre-conceptual ingestion of oestrogen containing medications, motion disorders, history of migraine and positive family history of HEG.<sup>9</sup> Helicobacter pylori (*H. pylori*) infection is considered to affect about half of the population all over the world, mainly affecting population living in developing countries.<sup>10</sup> Helicobacter pylorus is a bacterium that colonizes the stomach early during childhood. *H. pylori* infection is the common risk factor for developing peptic ulcers and future gastric cancer.<sup>11</sup> It is prevalent among pregnant women, and the prevalence rates of this infection during pregnancy are different depending on many factors like geography and socioeconomic status, in addition, to differences in techniques used to diagnose

### Patients and methods

The design of present study was a case control study carried out in Maternity Teaching Hospital in Erbil city, Kurdistan region-Iraq through one-year period from 1<sup>st</sup> of May 2019 to 30<sup>th</sup> of April 2020. The inclusion criteria included all pregnant women admitted in Maternity Teaching Hospital in Erbil city between five to fifteen weeks of pregnancy complaining from symptoms of hyperemesis gravidarum, while the control group was pregnant women with same gestational age but without manifestations of HEG. The exclusion criteria were pregnant women with history of thyroid disorders, multiple pregnancy, gestational trophoblastic disorders, hepatobiliary disorders, gastric or any intestinal diseases and women refused to participate in the study. An ethical approval was taken from the Ethical Committee of Kurdistan Higher Council of Medical Specialties and respecting the confidentiality of patients' data. The data were collected directly from pregnant women of both groups and filled in prepared questionnaire. Diagnosis of hyperemesis gravidarum was done depending on clinical presentations severe vomiting ( $\geq 3$  times per day), not

the *H. pylori* infection. Helicobacter pylori infection was thought to play role in development of many pregnancy disorders like maternal anemia, maternal thrombocytopenia, intrauterine fetal growth restriction and miscarriage.<sup>12</sup> Many authors explored the relationship between *H. pylori* infection and increase risk and severity of HEG in pregnancy.<sup>13-15</sup> Iraqi studies on relationship between HEG and *H. pylori* infection are scarce, although, higher prevalence of *H. pylori* infection among Iraqi general population ranges between 26.6% to 55.8% in different age groups.<sup>16, 17</sup> For these reasons, we conduct this study that is aiming to find out whether sero-positivity for IgG antibodies to *H. Pylori* are related to hyperemesis gravidarum.

responding to traditional treatment, weight loss ( $\geq 5\%$  of body weight). The socioeconomic status was classified according to family income per month; high ( $>1500$  \$ per month), middle (500-1400 \$ per month) and low ( $<500$  \$ per month). The body mass index was classified into normal ( $BMI < 25$  Kg/m<sup>2</sup>), overweight (25-29.9 Kg/m<sup>2</sup>) and obese ( $BMI \geq 30$  Kg/m<sup>2</sup>). The gravidity history of pregnant women was categorized into; primigravidity, 2-4 gravida and  $\geq 5$  gravida, while the parity history was categorized into; nulliparity, 1-2 para and 3-4 para. The past medical history included the previous history of medical diseases like hypertension, diabetes mellitus and ischemic heart diseases. A sample of 5 ml blood was drawn from each woman for serum electrolytes and immunoglobulin G antibody tests for *H.pylori*. The investigations were all done in the laboratory of Maternity Teaching Hospital except for *H. pylori* IgG antibody, which was done at private laboratory in Erbil city by ELISA. The data collected were analyzed statistically by Statistical Package of Social Sciences software version 22. The Chi square and

Fischer's exact tests were applied for analyzing the data as suitable. Level of significance (p-value) was regarded

statistically significant if it was 0.05 or less.

### Results

The selected sample included eighty pregnant women; one group included forty pregnant women with HEG and second group included forty controls after eligibility to inclusion and exclusion criteria. No significant differences were observed between pregnant women with HEG and control pregnant women regarding their age (p=0.3), residence (p=0.3) and smoking (p=0.4). There was a

highly significant association between primary and secondary educational level of pregnant women with HEG (p<0.001). A significant association was observed between low socioeconomic status of pregnant women and HEG (p=0.02). Pregnant women with normal BMI were significantly related to HEG (p=0.03) Table (1).

**Table (1):** Distribution of CLL woman's general characteristics according to study groups.

Variable	Study groups				p-value
	HEG		Control		
	No.	%	No.	%	
Age					0.369
<20 years	7	17.5	4	10.0	
20-29 years	24	60.0	22	55.0	
30-39 years	9	22.5	14	35.0	
Residence					0.340
Urban	15	37.5	11	27.5	
Rural	25	62.5	29	72.5	
Educational level					<0.001
Illiterate	19	47.5	34	85.0	
Primary level	8	20.0	0	-	
Secondary level	6	15.0	0	-	
College/institute	7	17.5	6	15.0	
Socioeconomic state					0.025
High	3	7.5	2	5.0	
Middle	22	55.0	33	82.5	
Low	15	37.5	5	12.5	
Smoking					0.456
Yes	3	7.5	5	12.5	
No	37	92.5	35	87.5	
Body mass index					0.039
Normal	29	72.5	20	50.0	
Overweight	11	27.5	20	50.0	

No significant differences were observed between pregnant women with HEG and control pregnant women regarding

gravidity (p=0.2), parity (p=0.2), abortion (p=0.09), previous history of HEG (p=0.7) and drug history (p=0.6). Table (2)

**Table (2):** Distribution of gestational and clinical characteristics according to study groups.

Variable	Study groups				p-value
	HEG		Control		
	No.	%	No.	%	
<b>Gravidity</b>					0.233
Primigravida	18	45.0	11	27.5	
2-4 gravida	20	50.0	25	62.5	
≥5 gravida	2	5.0	4	10.0	
<b>Parity</b>					0.243
Nulliparous	18	45.0	13	32.5	
1-2 para	20	50.0	21	52.5	
3-4 para	2	5.0	6	15.0	
<b>Abortion</b>					0.094
No	35	87.5	29	72.5	
Yes	5	12.5	11	27.5	
<b>Gestational age</b>					0.446
7-10 weeks	12	30.0	9	22.5	
11-15 weeks	28	70.0	31	77.5	
<b>Previous history of HEG in past pregnancy</b>					0.799
Yes	11	27.5	10	25.0	
No	29	72.5	30	75.0	
<b>Drug history</b>					0.606
Positive	9	22.5	11	27.5	
Negative	31	77.5	29	72.5	

A significant relationship was observed between serum IgG of H. Pylori and pregnant women with HEG (p=0.02), 60% of pregnant women with HEG had positive IgG of H. Pylori as compared to 35% of

controls. No significant differences were observed between pregnant women with HEG and control pregnant women regarding serum Mg level (p=0.1) and serum total bilirubin (p=0.3). Table (3)

**Table (3):** Distribution of investigations measures according to study groups.

Variable	Study groups				p-value
	HEG		Control		
	No.	%	No.	%	
<b>Serum IgG</b>					0.025
Positive	24	60.0	14	35.0	
Negative	16	40.0	26	65.0	
<b>Serum Na level</b>					0.002
Normal	24	60.0	36	90.0	
Low	16	40.0	4	10.0	
<b>Serum K level</b>					0.007
Normal	20	50.0	32	80.0	
High	0	-	1	2.5	
Low	20	50.0	7	17.5	
<b>Serum Cl level</b>					0.034
Normal	30	75.0	37	92.5	
Low	10	25.0	3	7.5	
<b>Serum Mo level</b>					0.166
Normal	36	90.0	39	97.5	
Low	4	10.0	1	2.5	
<b>Serum total bilirubin level</b>					0.314
Normal	39	97.5	40	100.0	
Low	1	2.5	0	-	

## Discussion

The burden of HEG does not include the physical impact on pregnant women only, but it also has prevalent social, psychological and economic implications on women and the family, in addition to national health burden.<sup>18</sup> In present study, 60% of HEG pregnant women had positive IgG of *H. pylori* as compared to 35% of controls. This finding is consistent with results of Ahmed's study<sup>19</sup> which reported that pregnant women with positive IgG of *H. pylori* were at high risk of gastrointestinal disorders and alteration of trace elements. Moreover, our study findings are similar to results of many literatures such as Al-Omda et al<sup>20</sup> study, Boltin et al<sup>21</sup> study and Li et al<sup>22</sup> study which found that positivity of IgG of *H. pylori* was higher among pregnant women with hyperemesis gravidarum. In Iraq, previous prospective study found that positive *H. pylori* stool antigen test was significantly higher among pregnant women with hyperemesis gravidarum than controls, while the *H. pylori* serology test was not significantly different between both groups and recommended the use of *H. pylori* stool antigen test in pregnant women with HEG.<sup>23</sup> Similarly, Hussein study also found that the positivity of *H. pylori* stool antigen test was related to pregnant women with hyperemesis gravidarum.<sup>24</sup> However, recent study in Egypt reported higher *H. pylori* IgG serology titer among pregnant women with hyperemesis gravidarum than controls.<sup>25</sup> Although plenty of studies suggesting the relationship between *H. pylori* infection and hyperemesis gravidarum in pregnancy,

## Conclusions

Our study found that *H. pylori* infection is more common in women with hyperemesis gravidarum. The development of hyperemesis gravidarum in pregnancy leads to obvious electrolyte imbalance.

## Conflicts of interest

The author reports no conflicts of interest.

many authors failed to find a significant relationship between them.<sup>26-28</sup> This inconsistency of relationship might be attributed to differences in definition of HEG, study inclusion criteria and differences in study population. Many mechanisms were suggested for effects of *H. pylori* to HEG like distorted gastric emptying; decreased gastrointestinal motility and hypersensitivity to gastric or duodenal distention.<sup>29</sup> The present study found that serum levels of sodium, potassium and chloride were significantly lower among pregnant women with hyperemesis gravidarum. These findings are in agreement with results of many studies.<sup>30, 31</sup> In current study, there was a highly significant association between primary and secondary educational level of pregnant women with HEG. This finding coincides with results of Loh ET al<sup>32</sup> study. Our study found a significant association between low socioeconomic status of pregnant women and HEG. Consistently, Karaca ET al<sup>33</sup> study reported a significant relationship between hyperemesis gravidarum in pregnant women and *H. pylori* with important role of low socioeconomic status on *H. pylori* infection. In our study, pregnant women with normal BMI were significantly related to HEG. This finding is inconsistent with results of Kosus ET al<sup>34</sup> study. This inconsistency might be due to differences in study designs and inclusion criteria between two studies in addition to differences in obesity prevalence and dietary patterns between different communities.

Low educational level and low socioeconomic status of pregnant women are risk factors for hyperemesis gravidarum.

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