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## The Association Between Helicobacter Pylori Seropositivity And Risk Of Hyperemesis Gravidarum During Pregnancy

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### ABSTRACT

**Background:** A severe form of nausea and vomiting known as hyperemesis gravidarum is common among women who are expecting a baby. The reported occurrence of hyperemesis gravidarum is about .3 to 1.5 percent. Hyperemesis gravidarum's cause is still a mystery. Different explanations such as immune, endocrine disorders, genetics and metabolic problems as well as infections like helicobacter pylori. Helicobacter pylori infection and hyperemesis gravidarum have been linked in recent studies.

**Aim of the work:** To see whether there is a relationship between Helicobacter pylori infection and hyperemesis gravidarum during pregnancy.

**Patients and methods:** The obstetrics department at Al Hussein University Hospitals conducted a controlled comparative research between February and October 2021. There were 100 first-trimester pregnant women in the study. Group (A) consisted of 50 women with hyperemesis gravidarum, whereas Group (B) consisted of 50 women in excellent health. Both groups had their serum helicobacter pylori IgG titers checked to see whether they were seropositive.

**Results:** When it came to helicobacter pylori IgG levels, patients and controls differed significantly.

**Conclusion:** Research shows that helicobacter pylori infection should be regarded a risk factor for the development of hyperemesis gravidarum.

**Keywords:** Helicobacter Pylori; Hyperemesis gravidarum; Pregnancy.

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### INTRODUCTION

A disorder known as "morning sickness" affects up to 80% of all first-trimester pregnancies, and the symptoms typically begin between weeks 4 and 8 of pregnancy, but may linger up to weeks 16–18 of pregnancy. Most of the time, it's a non-emergency. Hyperemesis gravidarum (HG), which occurs in a tiny proportion of all pregnancies, is the medical term for extreme nausea and vomiting.<sup>1</sup>

About one to ten percent of all pregnancies are affected by symptoms lasting into the 20th or 22nd week of pregnancy.<sup>2</sup>

It is possible that some women may consider terminating their pregnancies or avoiding future pregnancies if the symptoms are severe enough.<sup>3</sup>

HG is characterised by constant nausea and vomiting, as well as ketosis and a considerable weight loss of more than 5% of the pre-pregnancy weight. It is possible for this illness to cause acute hypovolemia, acid-base imbalances, nutritional deficiencies, and even death. Patients with severe hyperemesis

necessitate hospitalization in 0.3% to 3% of the time.<sup>4</sup>

Hyperemesis gravidarum affects between 0.3% and 1.5% of all live births.<sup>5</sup>

It's unclear what causes pregnancy-induced vomiting and nausea, also known as hyperemesis gravidarum, which may be caused by a variety of factors, including hormonal changes and infections, as well as concerns with the immune system and metabolism.<sup>6</sup>

HG is the most frequent reason for a woman to be admitted to the hospital during the first half of her pregnancy, but it's by no means the only one. Mortality may occur if it is accompanied with other serious maternal morbidities, such as Wernicke's encephalopathy.<sup>5</sup>

Helicobacter pylori (H. pylori), a common bacteria present in the stomach has been linked to both gastritis and peptic ulcers. H. pylori is considered to have a role in the development of stomach tumours and lymphomas according to a number of studies.<sup>7</sup>

H. Pylori prevalence in destitute countries ranges from 70 to 90 percent, but in industrialised countries, it is between 25 and 50 percent.<sup>5</sup>

Testing for helicobacter pylori is possible using a variety of methods. These include blood antibody tests, stool antigen tests, and carbon urea breath tests for H. pylori infection (in which the case drinking urea labelled with 14C or 13C, then the bacteria absorb the labelled urea creating labelled CO<sub>2</sub> that could be measured in the patient breath). To detect H. pylori in an endoscopic biopsy, urease tests, histological examination, and microbic culture can all be used.<sup>8</sup>

Compared to a gastric biopsy, serology is expected to be more sensitive since the inflammatory process may be patchy. Pregnant women may now be tested for Helicobacter pylori infection using a simple, affordable and noninvasive fluorescent blood antibody test.<sup>4</sup>

### PATIENTS AND METHODS

From February through October 2021, the obstetrics department at Al Hussein University Hospitals conducted a controlled comparison research. Two groups of 100 first-trimester pregnant women were compared. For women with HG, if they vomited three or more times per day for no apparent reason

other than pregnancy, lost at least 5% of their pre-pregnancy weight, or developed ketonuria (+1 or more), they were classed as Group A. In Group B, there were a total of 50 healthy expectant mothers.

Expectant mothers ranged in age from 18 to 40 and had one successful intrauterine pregnancy, as well as a gestational age of less than 14 weeks. They also had no history of GIT or thyroid abnormalities. In addition, this study excluded patients with thyroid abnormalities, vomiting-inducing medical conditions (such as gastrointestinal problems or a history of stomach ulcers), multiple pregnancies, and gestational trophoblastic illnesses. Medical history, physical examination, pelvic ultrasound, blood count, serum electrolytes, hepatic and renal function tests, urine analysis, random blood sugar, and H. pylori IgG titer by ELISA were performed on all participants in the study.

### Statistical methodology:

In order to analyse the collected data, IBM-SPSS 26.0 was employed (SPSS Inc., Chicago, IL, USA). For two-tailed comparisons, we regarded any P-value less than 0.05 as significant, while any value more than or equal to 0.05 was insignificant. Qualitative data in percentages and frequencies was provided as a result. The standard deviation and the mean were used to depict quantitative data.

### RESULTS

Age, parity, or gestational age did not vary significantly across study groups. (As shown in Table No. 1)

Serum electrolytes, haemoglobin, and hematocrit levels were significantly altered in the groups studied. While hematocrit levels in the cases group (HG) were higher, serum electrolytes and haemoglobin were lower than control group. (As shown in Table No. 2)

This difference was statistically significant, with 74% of the patients having IgG antibodies to Helicobacter pylori, compared to only 32% of the control group (p 0.001). (As shown in Table No. 3)

Variable	Cases group (HG) n=50	Control group n=50	P value
<b>Age (years)</b> mean± SD	26.5± 2.6	27.4±3.1	0.134 <sup>1</sup>
<b>Parity (n,%)</b>			
Nulliparous	26(52%)	23(46%)	0.548 <sup>2</sup>
Multiparous	24(48%)	27(54%)	
<b>Gestational age (Weeks)</b> mean± SD	8.6± 1.4	8.9± 1.7	0.211 <sup>1</sup>

Student t test; 2. Chi square test. \*p is significant at <0.05

**Table 1:** Basic maternal characteristics among the studied groups

Variable	Cases group (HG) n=50	Control group n=50	P value
<b>Na<sub>(mmol/L)</sub></b> mean± SD	135.74±2.95	140.2±2.87	<0.001* <sup>1</sup>
<b>K<sub>(mmol/L)</sub></b> mean± SD	3.57±0.32	4.17±0.33	<0.001* <sup>1</sup>
<b>Hct(%)</b> mean± SD	33.67±1.95	32.04± 2.61	0.001* <sup>1</sup>
<b>Hb(g/dl)</b> mean± SD	10.86±0.83	11.24±0.65	0.012* <sup>1</sup>
<b>Urine Acetone (n,%)</b>			
Nil	8(16%)	50(100%)	0.548 <sup>2</sup>
+	17(34%)	0(0%)	
++	18(36%)	0(0%)	
+++	7(14%)	0(0%)	

Student t test; 2. Chi square test. \*p is significant at <0.05

HCT; hematocrit, Hb; hemoglobin

**Table 2:** Laboratory investigations results among the studied groups

H.pylori IgG test	Cases group (HG) n=50	Control group n=50	P value
<b>Positive</b> (n,%)	37(74%)	16(32%)	<b>&lt;0.001*<sup>1</sup></b>
<b>Negative</b> (n,%)	13(26%)	34(68%)	

Chi square test; \*p is significant at <0.05

**Table 3:** H.pylori IgG seropositivity results among the two studied groups

## DISCUSSION

Whereas the "Morning sickness" describes mild to moderate disease, Hyperemesis gravidarum is the term used to describe the severe end of the symptom spectrum.<sup>9</sup>

Recurrent vomiting and considerable weight loss (greater than 5% of pre-pregnancy weight) are symptoms of HG, a disorder that affects pregnant women which may cause symptoms like as vomiting, ketosis, nutritional deficiencies, and even death.<sup>4</sup>

Patients with HG often need inpatient care to prevent possibly fatal effects.<sup>10</sup>

The origins of HG are still a mystery, despite its intricacy. It's possible that oestrogen, human chorionic gonadotropin, and progesterone all have a role in this disease. Personal variables, such as weight gain, have also been cited as probable causes of the problem.<sup>11</sup>

*Helicobacter pylori* is classified as a gram-negative spiral bacterium. Infection with this bacterium for an extended period of time has been linked to chronic gastritis, duodenal ulcers, and stomach cancer. Pregnant women who are infected with *Helicobacter pylori* are more likely to develop severe HG than those who are not infected.<sup>12</sup>

The obstetrics department at Al Hussein University Hospitals conducted a controlled comparative research from February to October 2021. Two groups of 100 first-trimester pregnant women were compared. There were 50 women with HG and 50 women who were healthy in each group. According to serum H. pylori IgG titers, both groups were tested for positive H. pylori.

Each group's fundamental maternal characteristics matched up well with the other's. The age, parity, and gestational age differences between the two groups were so small that they could not be detected statistically.

Serum sodium and potassium were comparable among the studied groups with statistical significant differences as HG group had lower Na ( $135.74 \pm 2.95$ ) and K ( $3.57 \pm 0.32$ ) than Control group ( $140.2 \pm 2.87$ ), ( $4.17 \pm 0.33$ ) respectively. The findings of Jarraya et al.<sup>13</sup> and Hussein et al.<sup>10</sup> are consistent with these findings.

Patients' haemoglobin concentrations ( $10.86 \pm 0.83$ ) were substantially lower than those of the controls

( $11.24 \pm 0.65$ ). The findings of Hussein et al.<sup>10</sup> are consistent with these findings.

Higher IgG antibody titers against *Helicobacter pylori* were found in the hyperemesis group compared to the control group. The proportion of IgG seropositivity in patients (74%) was statistically higher than in controls (32 %). ", which is statistically significant (P-Value= 0,001).

Various research, with ELISA technique support this assertion. P-value was 0.001, which is very statistically significant when comparing H.pylori seropositivity across groups. As indicated by Tamamy et al.,<sup>11</sup> 86.67% of patients with hyperemesis gravidarum exhibited positive H pylori IgG antibodies, while 15 of 45 asymptomatic pregnant women had positive IgG antibodies.

According to Hussein KS<sup>10</sup>, 84.4% of pregnant women in the study group and 42.22% of those in the control group were found to have *Helicobacter pylori* (P= 0.003).

Ng and colleagues observed that the mean H. pylori IgG antibody level in the group that had vomiting was 73.8%, whereas the group with no vomiting was 25.8 (p<0.01).<sup>14</sup>

HG was shown to be linked to H. pylori infection in a meta-analysis. HG patients were shown to have a significantly higher rate of H. pylori infection (1289/1851) than non-HG patients, a meta-analysis of studies including 1851 HG patients.<sup>15</sup>

After looking at 25 case-control studies with 1455 HG patients and 1970 healthy controls, Sandven et al.<sup>16</sup> concluded that H. pylori infection rates in HG patients were considerably higher than healthy controls.

One more interesting finding was made by the researchers Golberg et al.<sup>17</sup> who found that in their large study of 1,732 participants and controls, women with *Helicobacter pylori* infection had an increased risk of HG compared to women without the infection.

HG and *Helicobacter pylori* infection have been linked in several investigations, including those by Cevrioglu et al.<sup>18</sup>. Similar arguments have been put out by Gisbert et al.<sup>19</sup> and Mansour et al.<sup>20</sup>

On the other hand, An unremarkable or non-significant connection was found in one study, but not in any other. As an example, Lee et al.<sup>21</sup> found that Hispanic American women with HG had a

somewhat lower incidence of *H. pylori* infection (65%) than those without the illness (67%).

Women with HG had lower rates of *H. pylori* infection (68 %) than those without the condition (79%). This difference was statistically insignificant in a study by Karadeniz et al.<sup>22</sup>

A study by Aytac et al.<sup>23</sup> including pregnant women with HG and controls, the *H. pylori* infection rates were not significantly different (41,1 vs. 40 %, respectively). This suggests that *H. pylori* infection does not increase the chance of developing HG.

Erdem et al.<sup>24</sup> and Hayakawa et al.<sup>25</sup> found no link between the severity of clinical symptoms and *Helicobacter pylori* seropositivity in emesis gravidarum.

*H. pylori* infection and HG were not linked in other trials, according to Golberg et al.<sup>17</sup> It's possible that these studies couldn't detect a link because of the small number of participants. Patients' memories of their prenatal symptoms are also used in this research, which introduces the possibility of self-reporting bias. There are several risk factors for *H. pylori* infection during pregnancy, such as "age, race, socioeconomic status, blood grouping, parity," "cigarette smoking, and changes in environmental variables," that might explain the discrepancy between our findings and those of other research.

### CONCLUSION

We believe that *helicobacter pylori* is to blame since we identified a strong correlation between high levels of *H. pylori* infection and HG. Consequently, *H. pylori* is a risk factor for HG .

Pregnant women with HG who give no response to therapy should be tested for *H. Pylori* infection, as well as those who want to get pregnant soon.

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