

## Anaemia in Women with Hyperemesis Gravidarum Admitted in a Tertiary Hospital

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Hyperemesis gravidarum is the most severe form of nausea and vomiting in pregnancy with poor pregnancy outcome. It is a disease with unknown etiology with great varieties of contributing factors. Prevalence of *H. pylori* among women with hyperemesis gravidarum has been revealed. A descriptive, cross-sectional study was carried out at antenatal ward, Department of Obstetrics and Gynaecology, Mymensingh Medical College Hospital, Mymensingh among purposively selected thirty-six patients with hyperemesis gravidarum with a view to assess the anaemia in women with hyperemesis gravidarum. Data were collected by using case record form. Statistical analysis was performed using SPSS version 20.0 for windows. Highest number 16 (44.44%) of respondents were in age group 20 to 24 years with a mean of 23.81 years and a standard deviation (SD) of 4.55 years. As many as 28(77.78%) women were housewives, and at least 14(38.89%) women had unplanned pregnancies. Highest 29(80.56%) number of women had their pregnancy duration between 8 to 12 weeks. Majority 20(55.56%) of the women were pregnant for first time. Of 16 multigravid women, 7(43.75%) had history of similar condition in their previous pregnancies. As many as 9(25.00%) women had family history of similar condition. On clinical examination 22(61.11%) women had anaemia. Mean haemoglobin level was 10.50 with a standard deviation of 1.04 gm per decilitre. At least 11 (30.56%) stool samples were positive for *H. pylori* stool antigen. Mild anaemia is common in women with hyperemesis gravidarum. Presence of clinical anaemia and HpSA test status has statistical association.

[SSNI Med Col J 2016 Jul; 1 (2):110-116]

**Key words:** Hyperemesis, gravidarum, anaemia

### Introduction

**H**yperemesis gravidarum, the most severe form of nausea and vomiting in pregnancy, is the most common indication of hospitalization during first trimester.<sup>1,2</sup> Hyperemesis gravidarum affects 0.3 to 2 percent pregnancies.<sup>3-5</sup> Hyperemesis gravidarum (HG) can seriously affect health and well-being of the pregnant women and her unborn foetus.<sup>6</sup> It has deleterious effects

like dehydration, metabolic acidosis due to starvation, metabolic alkalosis resulting from loss of hydrochloric acid, electrolyte imbalance like hypokalaemia, and weight loss.<sup>7,8</sup> Hyperemesis gravidarum (HG) cases with more than 5 percent weight loss coupled with long term undernourishment result in adverse pregnancy outcomes like low birth weight, antepartum haemorrhage, preterm delivery and foetal anomalies.<sup>9-11</sup> Known

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facts are that it is limited to first trimester, more common in first pregnancy with tendency to recur in subsequent pregnancies. Besides, it has a familial history, common in unplanned pregnancy, more prevalent in multiple pregnancies, more common in younger mothers, women with history of motion sickness, migraine and nausea and vomiting associated with oral contraceptive, and in hydatidiform mole.<sup>3,8</sup> Hyperemesis gravidarum is a multifactorial disease with mostly unknown pathogenesis. Numerous genetic and environmental risk factors considered to involve in the condition. Hormones, psychogenic factors, dietary deficiency and allergic or immunological factors contribute in the pathogenesis. Recently, a high prevalence of *Helicobacter pylori* has been revealed among pregnant women with Hyperemesis gravidarum. Besides hormones, psychogenic, dietary deficiency and allergic or immunological factors play role in the pathogenesis of Hyperemesis gravidarum.<sup>8</sup> In addition, there is an association between infection with *H. pylori* and Hyperemesis gravidarum. Socio-economic status is an important risk factor for *H. pylori* infection in pregnant women with Hyperemesis gravidarum.<sup>12</sup> *Helicobacter pylori* is one of the most common bacterium affecting man.<sup>13,14</sup> The infection has high prevalence in developing countries<sup>13,14</sup> and affects particularly the young children.<sup>14</sup> Pregnant women are at an increased susceptibility to *H. pylori* infection resulting in a significantly high prevalence of *Helicobacter pylori*. During pregnancy, increased level of steroid hormones and Human Chorionic Gonadotrophin (hCG) result in change in P<sup>H</sup> and motility of gastrointestinal tract. These changes favour activation of *Helicobacter pylori* infection.<sup>1,2,7</sup> Moreover, altered humoral and cell-mediated immunity contribute to the manifestation of a latent *Helicobacter pylori* infection.<sup>1,7</sup> Nashaat et al. (2010)<sup>15</sup> made suggestions for

conducting screening test for *Helicobacter pylori* in prolonged cases of Hyperemesis gravidarum. *Helicobacter pylori* captures as well as utilizes iron for its survival, results in bleeding gastritis and interferes with iron absorption from the gut. Thus the organism is responsible for producing iron deficiency anaemia.<sup>1</sup> There exists a positive relationship between iron deficiency anaemia and *Helicobacter pylori* infection in pregnant women.<sup>11</sup> As a consequence, severe anaemia may complicate the pregnancy and childbirth in the form of antepartum haemorrhage, obstructed labour, post-partum haemorrhage and retained placenta. Over and above, undernutrition has been described in relation to Hyperemesis gravidarum as a consequence of the disease, not as a cause. Undernutrition affects the immune system and increases the risk of infection. Though it is not established that concomitant infections contribute to the development of Hyperemesis gravidarum, an association between Hyperemesis gravidarum and *H. pylori* infection has been described.<sup>16</sup> Involvement of *Helicobacter pylori* can easily detected by invasive method like *Helicobacter pylori* stool antigen (HpSA) test. *H. pylori* Stool Antigen (HpSA) test is qualitative in nature and is focused on the diagnostic detection of *H. pylori* antigens in stool samples. As a noninvasive method, HpSA test gives reliable result particularly in adult patients.<sup>17</sup> Unlike serology, HpSA test does not require highly specialized equipment.<sup>18</sup> and is more likely to provide evidence of active or ongoing, rather than past infection.<sup>19</sup> This study was carried out with a view to assess the anaemic status of women with Hyperemesis gravidarum.

## Methods

A descriptive cross-sectional type was carried out at antenatal ward, Department of Obstetrics and Gynaecology, Mymensingh Medical College Hospital, Mymensingh ranging from September 1, 2014 to May 31,

2016. Study was conducted among purposively selected thirty-six patients with Hyperemesis gravidarum who got admitted into the Hospital for treatment with age range from 18 to 35 years and pregnancy duration of 6 to 17 weeks. However, Hyperemesis gravidarum with thyroid diseases, multiple pregnancy, molar pregnancy and infections like Urinary Tract Infections (UTIs), Hepatitis, Meningitis, Appendicitis, Cholecystitis and Pancreatitis; and Gastrointestinal diseases like Small bowel obstruction etc. were excluded from the study. After obtaining informed written consent data were collected through interview when the patient became stable enough, and recorded in pretested Case Record Form (CRF). Gestational age was determined using the first date of last menstrual period, and confirmed by ultrasonography. Blood sample was taken for relevant laboratory investigations, whereas morning stool sample collected in sterile, clean, dry specimen container. On the very day of specimen collection, stool sample was tested for *Helicobacter Pylori* Stool Antigen (HpSA) using HpSA enzyme-linked immunosorbent assay (q detect™ One Step *H. pylori* Ag Rapid test, OMC Healthcare (Pvt.) Ltd., Canada, 2012<sup>20</sup>) according to manufacturer's instructions. At the end of each interview and filling up of each Case Record Form (CRF), the same was cross-checked for completeness, consistency, and discrepancy. Statistical analyses were performed using SPSS (Statistical Package for Social Sciences) version 20.0 for Windows (SPSS Inc, Chicago, III, USA). Descriptive statistics were calculated and reported as frequency and proportion for qualitative data, while quantitative data were described by frequency, proportion, mean and standard deviation.

## Results

A descriptive, cross-sectional study was carried out among 36 pregnant women to

assess the association of *Helicobacter pylori* in patients with hyperemesis gravidarum. Highest number 16 (44.44%) of respondents were in age group 20 to 24 years with a mean 23.81 years and standard deviation (SD) 4.55 years. At least 32(88.89%) women were literate, and an overwhelming majority 28(77.78%) of the respondents were housewives. Monthly family income was ranged from 12000 to 35000 Taka with a mean monthly family income 21166.67 Taka and a standard deviation (SD) of 5689.59 Taka.

Highest majority 22(61.11%) of the respondents had a plan for their current pregnancies, while in 14(38.89%) women did not have plan. Pregnancy duration of the respondents was ranged from 8 to 17 weeks with a mean duration of 10.64 weeks and a standard deviation of 2.35 weeks. An overwhelming majority 29(80.56%) of respondents had their pregnancy duration of 8 to 12 weeks, while 7(19.44%) respondents had their pregnancy duration over 12 weeks. Majority 22(61.11%) of pregnant women were nullipara, while 14(38.89%) were multipara. Majority 20(55.56%) of women with Hyperemesis gravidarum were pregnant for first time, while 16(44.44%) women were multigravida. Minimum duration of illness was 2 weeks and highest duration of illness was 10 weeks with a range of 8 weeks. Mean duration of illness was 5.53 weeks with a standard deviation of 1.98 weeks. Duration of illness in majority 19(52.78%) of the respondents was 5 to 9 weeks, while in 15(41.66%) respondents it was within 4 weeks and in 2(5.56%) respondents it was 10 to 14 weeks. Onset of manifestation for Hyperemesis gravidarum in majority 23(63.89%) of women was between 5 to 9 weeks, while in 13(36.11%) women it was in first 4 weeks of pregnancy. Mean time for onset of manifestation was 5.22 weeks with a standard deviation of 1.20 weeks. Of 16

multigravid women, 7(43.75%) had history of similar condition in their previous pregnancy. Of 36 women with Hyperemesis gravidarum, 9(25.00%) had family history of similar condition. Of 9 women with family history of similar condition, mother of 6(66.67%) women were affected, while sister(s) of 3(33.33%) women had history of similar condition during their pregnancies. Majority 21(58.33%) of the pregnant women had vomiting frequency 10 to 12 times, while 15(41.67%) had frequency between 4 to 9 times in a day. Mean frequency of vomiting was 5.47 times with a standard deviation of 2.16 times in 24 hours. Cent per cent pregnant women were dehydrated. Of 36, majority 24(66.67%) women had some sign of dehydration, while 9(25.00%) had no sign of dehydration and 3(8.33%) women had severe dehydration. It was evident from clinical examination that 22(61.11%) women had anaemia (Table I). Regarding Haemoglobin level was ranged from 9.00 gm to 12.50 gm per decilitre with a mean of 10.50 gm per decilitre and standard deviation of 1.04 gm per decilitre. It was revealed that out of thirty-six, 22 (61.11%) women who were detected anaemic in clinical examination were suffering from mild anaemia with haemoglobin percentage between 8 to 10 gm per deciliter (Table II). As regard to the result of HpSA test, it was estimated that 11 (30.56%) stool samples were positive for *H. pylori* stool antigen, while 25 (69.44%) samples were negative for the antigen. Presence of anaemia had statistical association with *H.pylori* infection ( $p < 0.05$ , Table III).

Table I: Respondents by status of anaemia

Anaemia	Frequency	Percentage
Present	22	61.11
Absent	14	38.89
Total	36	100.00

Table II: Pregnant women by haemoglobin percentage

Haemoglobin percentage in gm/decilitre	Frequency	Percentage
Over 10	14	38.89
8 - 10	22	61.11
Total	36	100.00

Mean  $\bar{x}$  = 10.50 gm per dl; Standard Deviation, SD = 1.04 gm per dl

Table III: HpSA test status by clinical status of anaemia

HpSA Test Status	Clinical Status of Anaemia		Total
	Present	Absent	
Positive	7(63.64)	4(36.36)	11
Negative	15(60.00)	10(40.00)	25
Total	22	14	36

- Figure within parentheses indicate percentages
- $\chi^2_{1} = 0.035$ ;  $p < 0.05$

## Discussion

A descriptive, cross-sectional study was conducted among 36 women with Hyperemesis gravidarum admitted at antenatal ward of Obstetric and Gynaecology Department of Mymensingh Medical College Hospital (MMCH), Mymensingh to assess the association of *Helicobacter pylori* with Hyperemesis gravidarum.

It was observed that highest number 16 (44.44%) of respondents were in age group 20 to 24 years with mean age of 23.81 years and standard deviation (SD) of 4.55 years. As many as 18(50.00%) respondents had their residence in rural area. At least 28(77.78%) pregnant women were housewives, and an overwhelming majority 29(80.56%) of the respondents had educational status below 12 years. As many as 20(55.56%) women were pregnant for the first time. These findings have been vindicated by the observation made by Karaca et al. (2004) that lower socio-economic status is the risk factor for infection with *H. pylori* in general population.<sup>16</sup> Moreover, these findings are substantiated by observation made by Lee and Saha (2011) that nausea and vomiting in pregnancy is more common in younger women, primigravida and women with less than 12 years of education.<sup>21</sup>

An overwhelming majority 29(80.56%) of the respondents had their pregnancy duration between 8 to 12 weeks, and at least 20(55.56%) of women with Hyperemesis gravidarum were pregnant for first time. Of 16 multi-gravid women, 7(43.75%) had history of similar condition in their previous pregnancies. Of 36 women with hyperemesis gravidarum, 9(25.00%) had family history of similar condition. Of 9 women who had family history of similar condition, mother of 6(66.67%) women were affected, while sister(s) of 3(33.33%) women had history of suffering from the similar condition during

their pregnancies. A significant number 14(38.89%) of women did not have plan for current pregnancy. These findings are in accordance with the observation made by Dutta (2015) that Hyperemesis gravidarum (HG) is mostly limited to the first trimester, more common in first pregnancy with a tendency to recur in subsequent pregnancies, runs in family, mother and sisters too suffer from similar manifestations and most common in unplanned pregnancies.<sup>8</sup> Lee and Saha (2011) revealed that mothers of nearly 28 percent women and sisters of 19 percent women suffered from Hyperemesis gravidarum.<sup>21</sup> These findings are not in line with that of current study findings that might be due to small sample size and purposive, nonprobability sampling technique followed for the selection of the patients with Hyperemesis gravidarum.

As many as 21(58.33%) pregnant women had vomiting frequency 10 to 12 times a day, and loss of weight was five percent or more in comparison to their prepregnancy weight in cent per cent women. All the pregnant women had dehydration. Carmella (2012)<sup>22</sup> observed that Hyperemesis gravidarum usually starts during the first 12 weeks of pregnancy, the most common symptoms of hyperemesis gravidarum are vomiting more than three times per day, becoming dehydrated, losing more than 10 pounds or five percent of prepregnancy body weight due to vomiting which is in line with the current study findings. It was revealed that in majority 19(52.78%) of women duration of illness was 5 to 9 weeks. In as many as 23(63.89%) women manifestation of Hyperemesis gravidarum started in between 5 to 9 weeks of gestation. These findings are in agreement with the observation made by Abd Alwahed et al. (2014) that nausea and vomiting in pregnancy usually starts between 4 to 9 gestational weeks, becomes maximum at 12 to 15 weeks.<sup>7</sup> Moreover, Carmella (2012)

observed that Hyperemesis gravidarum usually starts during the first 12 weeks of pregnancy that has consistency with the current study findings.<sup>22</sup>

It was evident from clinical examination that of thirty-six, 22(61.11%) women had anaemia. Minimum level of haemoglobin was 9.00 gm per decilitre, while maximum was 12.50 gm per decilitre with a mean of 10.50 gm per decilitre and a standard deviation of 1.04 gm per decilitre. It was revealed that twenty-two (61.11%) women who were detected anaemic in clinical examination were suffering from mild anaemia with haemoglobin percentage was between 8 to 10 gm per decilitre. Bezircioglu et al. (2011)<sup>1</sup> in a case-control study revealed that out of 36 women with Hyperemesis gravidarum, anaemia was encountered in 5(13.89%) patients. Moreover, a positive relationship was demonstrated between iron deficiency anemia and *H. pylori* infection in pregnant patients. Pregnant women with Hyperemesis gravidarum and positive *Helicobacter pylori* Stool Antigen (HpSA) had higher prevalence of iron deficiency anemia. Of 5, four (80%) had HpSA test positive. However, grading of anaemia was not done. These do not match with the current study findings that might be attributed to small sample size and purposive sampling used for selection of the patients with Hyperemesis gravidarum. At least 11(30.56%) of stool sample were positive for *H. pylori* stool antigen. In a case-control study by Bezircioglu et al. (2011)<sup>1</sup> in Turkey including 36 women with hyperemesis gravidarum between 10 to 14 weeks of pregnancy revealed that stool specimen of 8 women were positive for HpSA with a prevalence of 22.2 percent among cases. Karadeniz et al. (2005) in a prospective study revealed a 22.6 percent prevalence of *H. pylori* infection among cases.<sup>23</sup> These

findings are more or less in concordance with the current study findings.

### Conclusion

On the basis of study findings it can be concluded that mild anaemia is common in women with hyperemesis gravidarum. Presence of clinical anaemia and HpSA test status have statistical association.

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