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Original Research Article

Prevalence of hyperemesis gravidarum and associated risk factors among pregnant women in a tertiary health facility in Northeast, Nigeria

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ABSTRACT

Background: One of the commonest symptoms observed in pregnant women before the 20th week of gestation is nausea and vomiting, an exaggeration of these symptoms hyperemesis gravidarum (HEG) could result in maternal and fetal catastrophes and even death. The objective of this study was to determine the prevalence and associated risk factors for hyperemesis gravidarum among pregnant women at booking.

Methods: A prospective institutional based study design was done among 452 pregnant women seen at booking in a tertiary hospital in Northeast Nigeria from the 1st February 2019 to 30th June 2019. Data was summarized using descriptive statistics. OR was used to measure significant risk.

Results: The observed prevalence of hyperemesis gravidarum among pregnant women in the study is 44.9%. The Majority (81.4%) of these women were between the age range of 21 and 35 years. Mean age of 27 years. Multiparity (33.4%), previous (44.9%) and family history of HEG (31.6%) were identified as important risk factors for developing HEG. Grand multiparity (11.5%) and gestational age less than 13 weeks (6.64%) were however less likely observed to be risks for HEG.

Conclusions: HEG is a common problem in pregnancy with almost half of the number of pregnant women at booking affected. Multiparity and past history of HEG are pointers to developing the condition and it should be looked out for among at risk group of pregnant women, so that early intervention can be instituted to avoid any possible adverse outcome.

Keywords: Hyperemesis gravidarum, Prevalence, Risk factors

INTRODUCTION

Among the commonest and earliest gastro-intestinal symptoms observed during pregnancy is nausea and vomiting, with as many as 60% of women getting relief by the end of first trimester and 90% of pregnant women

by the 20th week of gestation, although only one tenth of women have symptoms that continue throughout pregnancy.^{1,2} and close to 5% women get a solution to these symptoms only after delivery of the baby.¹⁻⁴ The persistence of these symptoms may have on-toward effects on both the psychosocial, environmental and

partners support for the pregnant women.⁵ Hyperemesis gravidarum (HEG) have clinically been categorized as mild and severe with the severest form of the symptoms spectrum characterized by severe nausea and vomiting which interferes with nutritional intake and food metabolism, resulting in fluid and electrolyte imbalance.^{1-3,6} It is the commonest reason for in-hospital admission in the first half of pregnancy and it is second only to preterm labour as a cause of hospitalization during pregnancy, complicating between 0.3% to 2% of all pregnancies.⁷⁻¹⁰

The prevalence of severe nausea and vomiting varies from one population to another with the Asians and Blacks having higher rates. It ranges from as low as 0.3% in a Sweden, to as high as 10.8% in Chinese population of pregnant women.^{11,12} Higher incidence rate have been noted in Asian population. For instance, a Malaysian Eastern Asian population study noted HEG in 3.6% of the population.^{13,14} The highest rate of severe nausea and vomiting of pregnancy had been seen in Shanghai, China, a study done over a year revealed that the prevalence of HEG was 4.5% while in Addis Ababa, Ethiopia, a study on antenatal care clients in of three hospitals revealed a prevalence rate of 74.5% for Nausea and vomiting with 4.4% being admitted for severe symptoms.¹⁵ In Nigeria however, a study done in both eastern and northern Nigeria showed a high prevalence of nausea and vomiting of 43.7% with the eastern (Igbo race) having the highest incidence rate of 53.9% and the northern (Hausa Ethnic group) with the least (34.80%).¹⁶

Even though this health problem is huge with a significant adverse outcome, there is paucity of studies to show this huge burden and factors that are associated with the problem in north eastern Nigeria. So, the main aim of this study is to assess the prevalence of hyperemesis gravidarum and associated factors among women attending the antenatal clinic of Abubakar Tafawa Balewa University Teaching Hospital, Bauchi. It is hoped that the study will help all women affected by this health problem, health care professionals, researchers, government bodies and NGOs to find a lasting solution to it. In addition, it will provide a baseline information for further studies to be carried out and hopefully add to the literature pool of the burgeoning library.

Aims and objectives

To determine the prevalence of hyperemesis gravidarum and associated risk factors among women attending the antenatal clinic of Abubakar Tafawa Balewa University Teaching Hospital, Bauchi, Nigeria.

METHODS

The study design was a prospective descriptive type conducted at the Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH), Bauchi state. Participants

in this study included all consecutive pregnant women seen from 1st February to 30th June 2019, who came for their first antenatal clinic visit at this tertiary level public hospital in the north eastern Nigeria. The hospital received referrals from neighboring Yobe, Gombe, Jigawa and some parts of plateau states. All pregnant women who consented to the study were interviewed by trained research assistant using a structured questionnaire written in English, those pregnant women who were not literate had the questions translated into local language.

Inclusion criteria

Inclusion criteria of this study were all pregnant women that gave consent to participate in the study. Pregnant women carrying singleton fetuses.

Exclusion criteria

Pregnant women recently treated for Malaria, UTI, pyelonephritis and other acute surgical emergencies in index pregnancy. Pregnant women with multiple pregnancies and molar gestation. Pregnant women that had treatment for vitamin deficiency and any psychiatric illness. Women that did not give consent for the study were excluded from the study.

After verbal informed consent, each study participant was interviewed. The evaluation protocol included biodata, risk factors and complications of HEG. Personal identifiers were not used on the questionnaires.

Statistical analysis

Data gathered during interviews were coded, entered, verified, and cleaned in SPSS version 21 (IBM, USA). Analysis of the data was represented in frequency, percentages and odd ratios.

RESULTS

The observed prevalence of hyperemesis gravidarum among pregnant women in the study was 44.9%. The Majority (81.4%) of these women were between the age range of 21 and 35 years, with mean age of 27 years. Multiparity (33.4%), previous (44.9%) and family history of HEG (31.6%) were identified as important risk factors for developing HEG. Grand multiparity (11.5%) and gestational age less than 13 weeks (6.64%) were however less likely observed to be associated risks for HEG.

DISCUSSION

There is a high prevalence of HEG 44.9%, among the studied population even though this is slightly lower than the figures obtained from an earlier study in northern Nigeria in 2014, indicating that the condition has not changed much.¹⁶ In Norway, a similar prevalence rate of 47% was recorded. Lower figures have been reported in other studies like in Ethiopia with the prevalence of 4.8%

and 1.48% from a large population study in England, this may indicate a wide variation in the natural response to hormonal changes in pregnancy among the different study populations, in addition the time span in the studies vary.^{1,17}

Table 1: Age, parity, gestational and number of history of hyperemesis (n=452).

| Factors | Frequency | % |
|--|-----------|------|
| Age group (in years) | | |
| 11-15 | 1 | 0.22 |
| 16-20 | 35 | 7.74 |
| 21-25 | 142 | 31.2 |
| 26-30 | 131 | 28.8 |
| 31-35 | 96 | 21.4 |
| 36-40 | 43 | 9.51 |
| 41-45 | 4 | 0.88 |
| Parity | | |
| Primigravida | 89 | 19.7 |
| Multigravida | 311 | 68.8 |
| Grand multipara | 52 | 11.5 |
| Gestational age (weeks) | | |
| <13 | 30 | 6.64 |
| 14-27 | 314 | 69.7 |
| >28 | 108 | 23.9 |
| Previous history of hyperemesis | | |
| Yes | 203 | 44.0 |
| No | 249 | 55.0 |

Similar to the study in Ethiopia, the age range of women with HEG was between the 21 to 35 years (Table 1), this is a critical age that is considered to be the peak of reproductive career in women, the higher-risk observed in this group for HEG means that the condition should be routinely enquired and properly managed in all pregnant

women in this age bracket. In addition, age range below 30 years while pregnant as observed in this study (Table 2) is pivotal for women developing HEG. A study in England also observed an increased rate of HEG among pregnant women below the age of 30 years, who were also mostly found to be from the low socioeconomic class.^{1,17}

One of the consistent associates of HEG is nulliparity as observed in the England and other studies, this is largely due to the increasing circulating levels of human chorionic gonadotrophins and other stress hormones of pregnancy all occurring for the first time. Such was not exactly the case in this study, where quite a significant percentage of those that had HEG from this study (33.4%) were multigravidas with the nulliparous clients constituting only 19.7%. Multiparity as observed in the study was a significant risk for HEG in this population (Table 3). Most women at the age of 30 in this environment might have had 2 or more deliveries because of the cultural practice of early marriage and child bearing in our region of practice. A glance at the age-related prevalence rates analyzed in this study population where 48% of the pregnant women (26-30 years) had history of HEG in the index pregnancy further corroborated these inference/observation (Table 4).

Unlike the Scandinavian cohort studies which show that hyperemesis gravidarum was associated with higher risk of lower birth weight and shorter gestational duration, this study indicated that the women with history of HEG have significantly higher gestational age more than the usual weeks for the peak for the occurrence of HEG.¹⁸⁻²⁰ (Table 5) for the low birth weight, this study did not follow-up the women to determine their pregnancy outcome.

Table 2: Comparisons of pregnant women with history of hyperemesis and age group (n=203).

| Age group | Yes | % | No. | % | Total | % | OR | Lower (95% C.I.) | Upper (95% C.I.) | P value |
|--------------|-----|-------|-----|-------|-------|-------|-------|------------------|------------------|---------|
| 11-15 | 1 | 0.22 | 0 | 0.00 | 1 | 0.22 | - | - | - | 0.666 |
| 16-20 | 12 | 2.65 | 23 | 5.09 | 35 | 7.74 | 0 | 0.000 | 0.000 | 1.000 |
| 21-25 | 64 | 14.16 | 78 | 17.26 | 142 | 31.42 | 0.639 | 0.060 | 6.823 | 0.711 |
| 26-30 | 63 | 13.94 | 68 | 15.04 | 131 | 28.98 | 0.406 | 0.041 | 4.000 | 0.440 |
| 31-35 | 46 | 10.18 | 50 | 11.06 | 96 | 21.24 | 0.36 | 0.036 | 3.549 | 0.381 |
| 36-40 | 16 | 3.54 | 27 | 5.97 | 43 | 9.51 | 0.362 | 0.036 | 3.608 | 0.387 |
| 41-45 | 1 | 0.22 | 3 | 0.66 | 4 | 0.88 | 0.563 | 0.054 | 5.875 | 0.631 |

Table 3: Comparisons of pregnant women with history of hyperemesis and parity (n=203).

| Parity | Yes | % | No. | % | Total | % | OR | Lower (95% C.L.) | Upper (95% C.L.) | P value |
|------------------------|-----|-------|-----|-------|-------|-------|-------|------------------|------------------|---------|
| Primigravida | 25 | 5.53 | 64 | 14.16 | 89 | 19.69 | 1 | - | - | 0.002 |
| Multigravida | 151 | 33.41 | 160 | 35.40 | 311 | 68.81 | 2.765 | 1.354 | 5.645 | 0.000 |
| Grand multipara | 27 | 5.97 | 25 | 5.53 | 52 | 11.50 | 1.144 | 0.636 | 2.06 | 0.021 |

Table 4: Prevalence rate among the respondents.

| Age group (in years) | Frequency | Respondent with history of HEG | Prevalence |
|----------------------|------------|--------------------------------|--------------|
| 11-15 | 1 | 1 | 100.00 |
| 16-20 | 35 | 12 | 34.29 |
| 21-25 | 142 | 64 | 45.07 |
| 26-30 | 131 | 63 | 48.09 |
| 31-35 | 96 | 46 | 47.92 |
| 36-40 | 43 | 16 | 37.21 |
| 41-45 | 4 | 1 | 25.00 |
| Total | 452 | 203 | 44.91 |

The mean gestational age for the occurrence of symptoms observed in this study was 13-20 weeks with the highest occurrence at 17 to 20 weeks and average range of 14-27

weeks, this is in sharp contrast to other studies where consistently, a gestational age of 9.6 to 9.8 + standard deviation were observed as the commonest gestational ages for the occurrence of HEG.^{19,20} The real etio-pathogenesis of HEG is not known but among the multiple risks associated with the occurrence of this condition are, women who are blacks or Asians, multiple pregnancies, trophoblastic disease, female sex fetuses, psychiatric condition, low social class and lower age are all considered to be at increased risk for HEG.^{3,21-27} A family history of HEG was also discovered in this study to be a reasonable risk for a pregnant woman to have HEG (Table 6), this finding is supported by Zhang et al and Vikanes et al who observed that HEG may indeed have a familial aggregation with both mothers and siblings of affected women having had or would have increased risk of intractable nausea and vomiting in their pregnancies.^{28,29}

Table 5: Comparisons of pregnant women with history of hyperemesis and gestational age (n=203).

| G.A (weeks) | Yes | % | No | % | Total | % | OR | Lower (95% C.L.) | Upper (95% C.L.) | P-value |
|-------------|-----|------|----|-------|-------|-------|-------|------------------|------------------|---------|
| 0-4 weeks | 0 | 0.00 | 2 | 0.44 | 2 | 0.44 | - | - | - | 0.415 |
| 5-8 weeks | 6 | 1.33 | 3 | 0.66 | 9 | 1.99 | 461.9 | 0 | - | 0.999 |
| 9-12 weeks | 9 | 1.99 | 10 | 2.21 | 19 | 4.20 | 0.143 | 0.018 | 1.161 | 0.069 |
| 13-16 weeks | 22 | 4.87 | 37 | 8.19 | 59 | 13.05 | 0.317 | 0.052 | 1.942 | 0.214 |
| 17-20 weeks | 43 | 9.51 | 59 | 13.05 | 102 | 22.57 | 0.481 | 0.092 | 2.521 | 0.386 |
| 21-24 weeks | 32 | 7.08 | 42 | 9.29 | 74 | 16.37 | 0.392 | 0.078 | 1.981 | 0.257 |
| 25-28 weeks | 40 | 8.85 | 39 | 8.63 | 79 | 17.48 | 0.375 | 0.073 | 1.928 | 0.240 |
| 29-32 weeks | 14 | 3.10 | 15 | 3.32 | 29 | 6.42 | 0.279 | 0.054 | 1.425 | 0.125 |
| 33-36 weeks | 23 | 5.09 | 16 | 3.54 | 39 | 8.63 | 0.306 | 0.054 | 1.73 | 0.180 |
| 37-40 weeks | 2 | 0.44 | 7 | 1.55 | 9 | 1.99 | 0.199 | 0.036 | 1.084 | 0.062 |

Table 6: Comparisons of pregnant women with history and family history of hyperemesis (n=203).

| Family history | Yes | % | No | % | Total | % | OR | Lower (95% C.L.) | Lower (95% C.L.) | P-value |
|----------------|-----|-------|-----|-------|-------|-------|-------|------------------|------------------|---------|
| Yes | 143 | 31.64 | 95 | 21.02 | 238 | 52.65 | 0.259 | 0.174 | 0.384 | 0.000 |
| No | 60 | 13.27 | 154 | 34.07 | 214 | 47.35 | 0.101 | 0.022 | 0.314 | 0.000 |

Also, previous past history of HEG has been associated with recurrence of HEG, these with the exception of multiple gestation were also the findings in this study, additionally, the incidence of HEG increases with multiple gestation, molar pregnancy, trisomy and fetal hydrops, though this study excluded women with those conditions.^{3,23}

A significant rise in body weight noticed during pregnancy might not be taken very serious by some women, but studies have shown that, a significant raise in body weight during pregnancy has been associated with occurrence of HEG.

Associations have also been noted between HEG and adverse maternal and fetal outcome sometimes even leading to adverse maternal condition like, Wernicke's encephalopathy and depressive illness on the fetus. HEG can lead to intrauterine growth restriction, birth asphyxia and even neonatal death.^{3,4,7,29}

This study has provided the point prevalence of HEG and its associated risk factors among pregnant women at booking in north east, Nigeria, further studies to determine the effect of maternal weight gain, pregnancy progress and outcome in these women will be required in the future.

CONCLUSION

The prevalence of HEG is high, while to compare to other studies, it is higher than that from other studies. The commonest risk factors were low maternal age, multiparity and previous history of HEG. Thus, this condition needs to be enquired from all pregnant women at risk for proper management.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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