ORIGINAL ARTICLE

HYPEREMESIS GRAVIDARUM IN A TERTIARY CARE CENTRE IN EASTERN NEPAL: A PROSPECTIVE OBSERVATIONAL STUDY

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Background: Hyperemesis gravidarum (HG) is the most severe form of nausea and vomiting of pregnancy which can have potentially dangerous complications if untreated. Its treatment is basically supportive as the condition itself is self-limiting. The aim of our study was to evaluate maternal characteristics in patients with HG including risk factors and treatment outcome with respect to improvement in Pregnancy Unique Quantification of Emesis (PUQE) scores, number of doses of antiemetics used, weight gain during treatment and duration of intravenous fluid therapy **Methods:** A cross-sectional study where all women admitted to B.P. Koirala Institute of Health Sciences with a diagnosis of HG during a period of one year were studied for different maternal characteristics. The severity of disease was quantified using Modified PUQE score and the various treatment outcomes considered. **Results:** The admission for hyperemesis gravidarum (n=81, including 13 readmissions) was 10.64% of total early pregnancy admissions (n=735).The condition was more common in nulliparous patients (56%) at a mean period of gestation of 8.93±2.33wks. Most patients suffered from moderate to severe disease at presentation, mean PUQE scores being 12.29±1.59.The median number of doses of intravenous antiemetics used was three (IQR 3-6), median weight gain was one kg (IQR 0-1 kg), median duration of intravenous fluid therapy was 24hrs (IQR 24-48 hrs) and mean length of hospital stay was 3.2±1.48 days. **Conclusions:** Hyperemesis is one of the common causes of hospitalization in early pregnancy. Treatment has favourable outcome with early recovery.

Keywords: hyperemesis gravidarum; pregnancy; treatment outcome

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INTRODUCTION

Hyperemesis is the most severe form of nausea and vomiting of pregnancy which often requires hospitalization. It is associated with dehydration and electrolyte imbalance, disturbance of nutritional uptake and metabolism causing physical and psychological debilitation.[1]

Its severity can be assessed using the Pregnancy Unique Quantification of Emesis (PUQE) Score[2] which has been validated and correlates well with clinical outcomes.[3] The PUQE score includes questions on the number of daily vomiting episodes, the length of nausea per day in hours and the number of retching episodes, with a minimum score of 3 and maximum score of 15. A score of <6 suggests mild HG , 7-12 moderate HG and 13 or more severe HG.[2] Its treatment is mostly supportive with the aim to control vomiting, manage electrolyte imbalance, correct dehydration and avoid complications. HG causes increased hospital burden, loss from work and reduced quality of life among pregnant ladies.[4]Hence, this study was designed to study the maternal characteristics in HG including various risk factors and treatment outcome with respect to improvement of the PUQE score, duration of hospital stay, duration of intravenous fluid therapy, number of doses of intravenous medication and weight gain during treatment.

MATERIAL AND METHODS

This study was a hospital based cross-sectional study conducted on patients admitted to gynaecology ward during their pregnancy due to hyperemesis gravidarum during the period of one year and meeting the inclusion criteria. The study was started after ethical clearance from the Institutional Ethical Review Board.

All the pregnant patients with hyperemesis in the first or early second trimester (≤16 weeks) meeting any of the inclusion criteria were enrolled in study. These included: inability to hold food, presence of ketonuria, electrolyte imbalances, weight loss ≥2.25kg (if weight documented) or more than one visit to outpatient department requiring treatment for vomiting. The exclusion criteria included patients who could be managed on outpatient basis, those with known eating disorders, history of psychiatric illness, with previous admission for HG in current pregnancy and those who refused to give consent. A detailed history was taken; clinical examination and investigations were done as per *pro forma*. Period of gestation was calculated from the last menstrual period or first trimester ultrasound scan whichever

available. Patients were managed as per routine hospital protocol which included keeping patient nil per orally (NPO) for first 24 hrs, administrating antiemetics 8 hourly,H2 receptor antagonist-ranitidine iv 8 hourly, thiamine folic acid/ and intravenous hydration therapy till they tolerated well orally.They were discharged on oral medications only after they met the following criteria: were able to tolerate food and water for 24hours, no ketonuria, no further weight loss, and no emesis for last 24 hours. The daily weight and PUQE scores were recorded and the outcome measures considered were: improvement in PUQE scores, duration of hospital stay (in days), duration intravenous fluid therapy (in hours), number of doses of intravenous medications and weight gain during treatment (in kg).

All analysis were done using SPSS version11.5.Normally distributed continuous data were analysed with the students *t*-test. Categorical data were analysed with the Fisher exact or Pearson chi square test; ordinal and skewed continuous data were analysed using Mann Whitney U test. *p* value <0.05 was considered statistically significant. The values have been expressed as mean±SD or median (interquartile range) whichever applicable.

RESULTS

Out of the total 735 patients who were admitted for early pregnancy complications 81 were admitted for HG out of which 68 women were hospitalized for the first time while 13 patients had readmissions. The baseline characteristics are shown in table-1.

The Criteria for diagnosis of hyperemesis was based on presence of excessive vomiting with any one of the enlisted complaints as shown in table-2. The different investigation parameters of the patients are shown in table-3.

Out of the total 56 patients who had ketonuria, in 49 patients (87%) it resolved in 3 days. For 13% it took longer than 3 days maximum being 10 days in a patient who was diagnosed as hyperthyroid and UTI.

Seventeen patients (25%) had deranged liver function tests. 10 of them had more than 2 fold rise in serum alanine transaminase and aspartate transferase.

A total of 8 patients (12%) who were admitted with diagnosis of hyperemesis were found to have culture positive urinary tract infection (UTI). They were treated with antibiotics according to culture sensitivity. Electrolyte abnormalities were seen in 3 cases (4%). In two patients hyponatremia was seen and one patient had hypokalemia, but all three patients were asymptomatic. Total 60 patients were actually suffering HG after excluding patients with UTI and hyperthyroidism.

The disease severity was assessed using PUQE scores. The mean PUQE scores at admission was12.29±1.59 signifying that most patients had moderate to severe disease at presentation. Paired t test showed improvement in the PUQE scores after treatment, with improvement in the severity of disease. The mean difference between the admission and day 1 PUQE scores was 5.51±2.20.

The variation in mean PUQE scores from admission to 96 hours of therapy has been depicted in figure-1.Course of hospital stay in the patients and the treatment parameters considered have been depicted in table-4.

Thirteen patients (19%) were readmitted with HG in the current pregnancy. Out of them two patients were hyperthyroid, one patient had history of sacrococcygeal teratoma operated at birth and subsequent history of pulmonary tuberculosis followed by tubercular meningitis during adolescent (treated),two of them had a culture positive UTI in first admission.7 patients had history of HG in family members and 3 patients had history of HG in previous pregnancy.

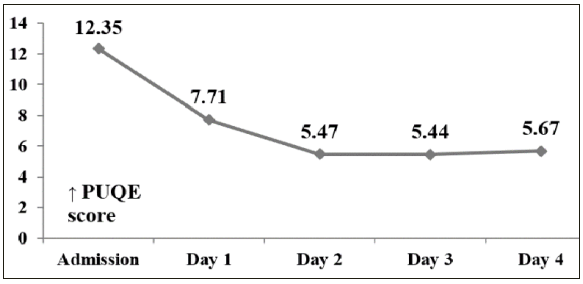

Figure-1: Variation in Mean PUQE score from admission to 96 hours

Table-1: Baseline characteristics of patients including possible risk factors (n=68).

Baseline characteristics (Mean/Median)		n	%
Age (24±4.43yrs)	<20 years	9	13
	20–25 years	38	56
	26–30 years	15	22
	>30 years	6	9
Occupation	Housewife	50	74
	Job holder	15	22
	Farmer	3	4
Parity Median parity one (IQR -1-2)	One	38	56
	Two	14	21
	≥3	16	23
Period of gestation Mean (8.93±2.33wks)	≤7wks	21	31
	8–10wks	31	46
	11–14wks	16	23
Singleton/twin gestation	Twin pregnancy	7	10
	Singleton pregnancy	61	90
Previous hyperemesis(n=33)		16	24
Previous molar pregnancy(n=33)		1	1.5
Family history of hyperemesis in mother/sisters		21	31
Used Drugs on outpatient basis		33	49

Table-2: Presenting complaints of patients

Presenting complaints	n	%
Unable to hold food	68	100
Ketonuria	56	82.35
Weight loss ≥2.25kg of pre pregnancy weight	20	29.41
≥2 OPD visits requiring treatment for emesis	18	26.47

Table-3: Investigations

Investigations	Categories	n	%
Ketonuria		56	82.4
Ketonuria resolved in (eligible=56/68)	≤3 days	49	87.5
	>3 days	7	12.5
Median number of days (IQR)		2 (2–3)	
Ultrasound finding	Missed	2	2.9
	Single	61	89.7
	Twin	5	7.4
Abnormal LFT		17	25
Growth in Urine c/s		8	11.8
Abnormal Na/K		3	4.4

Table-4: Treatment parameters during hospital stay

Characteristics(Mean/Median)		n	%
Weight change(median=1, IQR=0-1)	Loss≤3kg	6	9.1
	No change	21	31.8
	Gain≤3kg	39	59.1
Duration of hospital stay in days (Mean=3.22±1.48 days)	2	23	
	3	23	
	4	15	
	≥5	5	
Duration of iv fluids (Median-24hrs, IQR=24-48 hrs).	≤24hrs	43	65.2
	24–48hrs	14	
	>48hrs	7	
Induced abortion due to hyperemesis		4	5.8
Readmission		13	19.11
No of doses of iv medication (Median doses-3 IQR 3-6).	2	5	
	3	23	
	4	11	
	5	4	
	≥6	23	

DISCUSSION

Up to 80% of women experience nausea or vomiting (NVP)in early pregnancy but HG which affects only 0.3–1.5%[5–7]of pregnant women is the severe form of NVP with potential life threatening complications. In study done by Gazmararian *et al*[8] HG is found to be the second most common indication for hospital admission in pregnancies which ended with a live birth and the most common indication for hospital admission in early pregnancy. Another study done in Nepal medical college teaching hospital showed the incidence of HG to be 2.5% of all pregnancy.[9]In our study, the admission for HG was found to be 10.6%of total early pregnancy admissions.

Out of the 68 patients enrolled in this study 91% were of less than 30 years while only 9% were of age more than 30 years. In a study including 1270 patients by Dodds *et al*[10] 76.9% of patients were in age group of less than 30 years while 23.2% were of age more than 30 years. In a study done by Klebanoff *et al*[11], Price *et al*[12]decreased HG incidence was seen in women with advanced maternal age (≥35yrs, OR 0.5).

Fifty one percent of enrolled patients were pregnant for the first time. In a study done by Dodds *et al* 48.7% of the enrolled patients with HG were nulliparous.[10]In a study done by Giri *et al*[9] in Nepal 61.5% of patients admitted with HG were nulligravida and condition was less common in parity more than three. In other studies high incidences have been seen with nulliparity (odds ratio,1.6).[11]

Nausea and vomiting usually appears by 4th to 6th weeks of pregnancy and a peak is observed between 8th and 12th week. In a study done by Fejzo *et al*[13] on HG the mean gestational age at hospital admission was 8.6weeks. In this study also the mean period of gestation (in weeks) of the enrolled patients at time of admission was 8.93±2.33. In another study done in Nepal by Giri *et al*[9] the condition was seen at gestational age of 5–7 weeks in 50% of the patients.

The case definition of HG used was similar to that used by Sullivan *et al*.[14] All patients presented with history of excessive vomiting with inability to hold food severe enough to need hospitalization.

In this study 7 (10%) of the patients had twin pregnancy, remaining 61 were singleton pregnancies. In a study done by Fell *et al*[15] 2.4% (31/1270) of patients with HG were found to have multiple gestation which when compared with singleton pregnancy the relative risk was 2.1 (1.5–3.0) (*p*-value <0.001).

In my study, 16(24%)patients had history of hyperemesis in previous pregnancy .In a study done by Fell *et al*,[15] the chance of hyperemesis in second pregnancy was 19% if previous pregnancy was complicated with HG and 0.7% if there was no HG in first pregnancy. Similarly, a study done in Norway found the risk of HG in a woman's second pregnancy to be 15.2% if hyperemesis occurred in first pregnancy and 0.7% if it had not occurred.[16]

In a study done by Fejzo *et al*[13] 28% of patients had a family history of severe nausea or hyperemesis in their mothers and 19% in their sisters. Similarly in our study31% had history of HG in mother or sisters. This could be due to similar environmental risk factors, though none have been identified or due to genetic factors.

In our study only 1 patient had history of previous molar pregnancy. In previous study done by Klebanoff *et al* increased incidences have been noted in gestational trophoblastic disease, triploidy (partial mole).[11]

In the present study 16.05% (13 patients) were readmitted for HG. In a study done by Fell *et al*[15] the hospital readmission rate for HG was found to be 25% which is significant.

Most patients suffered from moderate to severe disease at presentation, mean PUQE scores being 12.29±1.59 which is acceptable as hyperemesis is the most severe form of NVP and the mean duration of hospital stay was 3.2±1.48 days. In study done by Giri *et al*[9] the mean hospital stay was 2.26 days and the range being 1–10 days. Other studies found hospital stay of 3–4 days.[15]

In a large cohort study done on elective termination of pregnancy done by Poursharif *et al*,[17] 123 women(15.2%) reported at least one elective termination of pregnancy due to HG and of these,49(39.8%) reported 2–10 terminations due to hyperemesis. In our study, four women (6%) opted for pregnancy termination due to HG inspite of treatment.

CONCLUSIONS

Hyperemesis is one of the common causes of hospitalization in early pregnancy. Treatment has favourable outcome with early recovery.

Competing interest: None

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AUTHOR'S CONTRIBUTION

MC contributed in study design, statistical analysis and manuscript writing; AT contributed in study design, preparation of manuscript; DKU contributed in study design; PB contributed in data acquisition and analyses; RJ contributed in data acquisition and analyses and manuscript preparation. All authors have read and approved of the document.

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