A Cross Sectional Study of Frequency of Transient Hyperthyroidism in a Tertiary Care Hospital in Patients with Hyperemesis Gravidarum

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Abstract

OBJECTIVE: To determine the frequency of transient hyperthyroidism in patients with hyperemesis gravidarum admitted in the obstetrics and gynaecology ward in Ayub Teaching Hospital Abbottabad.
MATERIALS AND METHODS: This study has been conducted in Department of obstetrics and Gynecology, Ayub Teaching Hospital Abbottabad for a period of 6 months. It was a prospective observational study conducted over a period of 6 months f from15th Dec 2015 to 15th of June 2016.
RESULTS: Our study shows that mean age was 29 years with SD ± 8.27. 68 % of patients were primi para while 32% patients were multi para. Mean gestational age was 12 weeks with SD ± 3.71. Mean duration of condition was 6 weeks with SD ± 2.57. The frequency of ttransient hyperthyroidism was 6%
CONCLUSION: Our study concludes that the frequency of transient hyperthyroidism was 6% in patients of hyperemesis gravidarum admitted in the obstetrics wards in Ayub teaching hospital.
KEY WORDS: transient, hyperthyroidism, hyperemesis

INTRODUCTION

Mild nausea and vomiting is a common occurrence in pregnant women. Most pregnant women experience morning sickness during the first 20 weeks of pregnancy[1.] However, it can occasionally become persistent and severe, taking the shape of a condition known as hyperemesis gravidarum (HG). This condition can be explained in may ways but the key features are unstoppable vomiting associated with weight loss of more than 5% what she had before pregnancy, dehydration, electrolyte imbalances, ketosis, and hospitalization. This disorder has an estimated incidence of 0.3% - 3% of all live births.[2]

This condition not only affects the health of the mother but also affects the growth and development of the fetus as well[3]. HG may continue through out the pregnancy, in contrast to morning sickness, which usually improves in the second trimester.

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This has an imperative role in increasing patients' morbidity and mortality. In addition to this it also affects her day-to-day life including her social and professional activities. Patient may resort to termination of pregnancy as a result of severe symptoms [4]

The aetiology of Hyperemesis gravidarum has been associated with excess levels of hormones related to pregnancy. During pregnancy, these hormones also alter the function of thyroid gland physiologically[5.]The term of 'transient hyperthyroidism of hyperemesis gravidarum' (THHG) has been suggested for pregnant patients with marked elevation of HCG and free T4 levels. Increased in the level of thyroid hormones occur in seventy per cent of women who experience excessive nausea and vomiting[6]

It has been proposed that THHG is partially caused by the high levels of human chorionic gonadotrophin that are often seen in patients with hyperemesis gravidarum. HCG and TSH are both structurally very similar and can mimic each other in their function. Thus this structural similarity enables HCG to act like TRH and hyper-stimulate the thyroid leading to hyperthyroidism[7.]

The thyroid function tests in transient hyperthyroidism in hyperemesis gravidarum show decreased TSH with elevated total T4, free T4, total T3 and free T3, a picture similar to that of Graves' disease [8.] The diagnosis is thus based on abnormal thyroid function tests

developing in the context of hyperemesis gravidarum, and absence of any history of thyroid disease before pregnancy and absence of thyroid antibodies[9].
It is essential to diagnose hyperthyroidism in hyperemesis gravidarum so that unnecessary waste of medical resources can be avoided. The aim of this study is to know the frequency of transient hyperthyroidism in hyperemesis gravidarum so that local evidence is created and this will increase evaluation on part of clinician for overall health management of hyperemesis gravidarum.

MATERIALS AND METHODS:
This research was carried out in obstetrics and gynaecology unit of Ayub Teaching Hospital Abbottabad in 6 months from 15th Dec 2015 to 15th June 2016 in 79 patients. The study was conducted after approval from hospital's ethical and research committee. Population size was calculated using the WHO software for sample size. Confidence interval 95%, Anticipated population of patients with decreased TSH 8%[10].Sampling technique was consecutive non-probability sampling with patients of age 18-35, any parity having pregnancy of up to 20 weeks gestation and presenting with hyperemesis gravidarum diagnosed by her clinical presentation and laboratory investigations. Patients with known causes of hyperemesis like Hydatiform mole, liver disorders, pyelonephritis and any other medical disorder leading to excessive vomiting were not included after checking their clinical records and relevant laboratory investigations like LFTS, RFTS and abdominal and pelvic ultrasound etc.
Age of patients, parity, duration of condition, gestational age, all other variables like HG, TH, TSH, free T4 were noted on a *proforma*.
Data was analyzed in SPSS version 10.0. Results were presented in the form of tables and graphs. Categorical variables like presence of transient hyperthyroidism were described as frequency or percentages. Quantitative variables like age, parity, levels of thyroid hormones were determined as mean ± standard deviation Data was stratified by age and parity, duration of condition and gestational age with respect to outcome variable i.e. presence of transient hyperthyroidism. Chi square test at 5% significance level was used to know difference by age and parity with respect to outcome variable.

Results:
Total 79 patients were studied as 32(40.5%) patients were between 18-25 years, 35 (43.5%) were 26-30 years and 12(15%) were between 31-35 years. Mean age was 29 ± 8.27 (Table No 1)
Parity distribution among 79 patients was analyzed.
54 (67.5%) patients were primi para while 25 (31.5%) patients were multi para (Table No 2).
Gestational age among 79 patients was analyzed as 28(34.5%) patients had gestational age range 1-10 weeks while 51 (64.5%) patients had gestational age range 11-20 weeks. Mean gestational age was 12 weeks with SD ± 3.71. (Table No 3)
Duration of condition among 79 patients was analyzed as 30(37.5%) patients had duration of condition range 1-5 weeks while 49(61.5%) patients had duration of condition range 6-10 weeks. Mean duration of condition was 6 ± 2.57. (Table No 4)
Levels of thyroid hormones among 79 patients was analyzed as 5 (5.5%) patients had serum TSH level, 5 (5.5%) patients had serum T4 level and 5(5.5%) patients had serum T3 level.(table No 5)
Transient Hyperthyroidism among 79 patients was analyzed as 5(5.5%) patients had transient hyperthyroidism, 74(93.5%) patients had transient hyperthyroidism (Table No 6).

Stratification of transient Hyperthyroidism with age, parity, gestational age and duration of condition is given in table no 7,8,9,10

TABLE NO 1. Age Distribution (n= 79)

Age	Frequency	Percentage
18-25 years	32	41%
26-30 years	35	44%
31-35 years	12	15%
Total	**79**	**100%**

Mean age was 29 ± 8.27

Table no 2. Parity distribution (n= 79)

Parity	Frequency	Percentage
Primi Para	54	68%
Multi Para	25	32%
Total	**79**	**100%**

Table no 3. Gestational age distribution (n= 79)

GESTATIONAL AGE	FREQUENCY	PERCENTAGE
1-10 weeks	28	35%
11-20 weeks	51	65%
Total	**79**	**100%**

Mean gestational age was 12 weeks with SD ± 3.71

Table no 4. Duration of condition (n= 79)

Duration of condition	Frequency	Percentage
1-5 weeks	30	38%
6-10 weeks	49	62%
Total	**79**	**100%**

Mean duration of condition was 6 ± 2.57

Table no 5. Levels of thyroid hormones (n= 79)

Levels of thyroid hormones	Frequency	Percentage
Serum TSH level (below 0.3 µIU/ml)	5	6%
Serum T4 level (11.5-23.0 p mol /L)	5	6%
Serum T3 level	5	6%
Total	**79**	**100%**

Table no 6. Transient hyperthyroidism (n= 79)

Transient hyperthyroidism	Frequency	Percentage
Yes	5	6%
No	74	94%
Total	**79**	**100%**

Table no 7. Stratification of transient hyperthyroidism w.r.t age distribution (n= 79)

Transient hyperthyroidism	18-25 years	26-30 years	31-35 years	Total
Yes	2	2	1	5
No	30	33	11	74
Total	**32**	**35**	**12**	**79**

Chi square test was applied in which P value was 0.9493

Table no 8. Stratification of transient hyperthyroidism w.r.t parity (n= 79)

HYPERTHYROIDISM	Primi para	Multi Para	Total
Yes	3	2	5
No	51	23	74
Total	**54**	**25**	**79**

Chi square test was applied in which P value was 0.6781.

Table no 9. Stratification of transient hyperthyroidism w.r.t gestational age (n= 79)

TRANSIENT HYPERTHYROIDISM	1-10 weeks	11-20 weeks	Total
Yes	2	3	5
No	26	48	74
Total	**28**	**51**	**79**

Chi square test was applied in which P value was 0.8257

Table no 10. Stratification of transient hyperthyroidism w.r.t duration of condition (n= 79)

Transient hyperthyroidism	1-5 weeks	6-10 weeks	Total
Yes	2	3	5
No	28	46	74
Total	**30**	**49**	**79**

Chi square test was applied in which P value was 0.9231

DISCUSSION

Our study shows that mean age was 29 ± 8.27. Sixty eight per cent patients were primi para while 31.5% patients were multi para. Mean gestational age was ± 3.71. Mean duration of condition was 6 ± 2.57. The frequency of transient hyperthyroidism was 6%

Tan JY[11] had reported that free T4 levels normalised by 15 weeks of gestation in the 39 (44.8%) women with transient hyperthyroidism while TSH remained suppressed until 19 weeks of gestation. None of these women were clinically hyperthyroid. Thyroid antibodies were not found in most of them. Median birth weight in the infants of mothers who experienced weight loss of > 5% of their pre-pregnancy weight was lower compared with those of women who did not (P = 0.093). Five women were diagnosed with Graves' disease based on clinical features and thyroid antibody profile.

Timothy[12] had reported that because thyroid function tests cannot distinguish Graves disease from TIIHG, the diagnosis of TIIHG rests largely on the concurrent development of hyperemesis and hyperthyroidism and the absence of signs and symptoms of hyperthyroidism before and during pregnancy. nIHG might be responsible for 40% to 70% of thyroid function abnormalities in pregnancy. Both the thyroid function abnormalities and hyperemesis are related to elevated levels of human chorionic gonadotropin TIIHG resolves by 18 weeks of pregnancy without a sequel. No treatment is required. Diagnosis of TIIHG by the primary care provider can prevent unnecessary treatment or referral for specialty care.

According to Goodwin et al [13,14] sixty six per cent of women with excessive vomiting had biochemical hyperthyroidism or suppressed TSH and that the severity of vomiting is associated directly with the degree of hyperthyroidism. In this study, we assessed different aspects like signs and symptoms, lab findings and antibody level of thyroid in a group of a women at both ends and tried to develop the criteria which could help to differentiate between temporary hyperthyroidism of hyperemesis gravidarum and Grave's disease.

Glinoer et al.[15]reported that human chorionic gonadotrophin remains abnormally high for several weeks during the second trimester and that normalisation of free T4 levels paralleled the decline in human chorionic gonadotrophin, supporting its role in the pathogenesis of transient hyperthyroidism with excessive vomiting. Unfortunately, our study did not look at HCG levels.

Babies born with low birth weight to the mother who experience excessive nausea and vomiting during the early part of the pregnancy specifically who experience weight loss during pregnancy and these are the women who are at risk of intra uterine growth retardation.[16]

In patients with hyperemesis mean birth weight was (2998.4g) which was much lower than the population mean of (3100g), but weather this is directly related to excessive vomiting alone or it has any clinical significance its is still not clear. Birth weight can be affected by multiple factors and as it was not the primary purpose of this study to look at those factors[17]

The temporary biochemical abnormality gets normal by itself at the middle of the pregnancy and does not require any different management of these women[18].

Grave's disease, which is the most common cause of hyperthyroidism in this population, can generally be diagnosed by clinical presentation as shown in our study.

In patients who develop excessive nausea and vomiting it was seen that female to male fetuses ratio was 2.6-3:1. This observation is also present in other studies related to excessive vomiting with pregnancy. The main reason seems to be high human chorionic gonadotrophin level that is in addition to its thyrotrophic effect, which has been hypothesised to support female conception.

In normal pregnancies, a female fetus is associated with higher concentration of human chorionic gonadotrophin at birth than a male fetus[19]. Further evidence comes from the studies that show a significant excess of female infants born after hormonal induction of ovulation with human chorionic gonadotrophin.

CONCLUSION

Our study concludes that the frequency of transient hyperthyroidism was 6% in patients of hyperemesis gravidarum admitted in the obstetrics wards in Ayub teaching hospital.

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