FREQUENCY OF HYPOTHYROIDISM AMONG WOMEN PRESENTING WITH PREECLAMPSIA

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Abstract

Objective: To determine the frequency of hypothyroidism among women presenting with Preeclampsia.

Methods: We conducted this cross-sectional study in Gynecology and Obstetrics unit, Khyber Teaching Hospital, Peshawar. A total of 369 patients (age above) with preeclampsia were selected meeting the inclusion criteria, through non-probability sampling and serum TSH and T4 measurements done in these.

Results: Total 369 women presenting with Preeclampsia with mean age was 33.02 years ± 7.50. Among total sample about 26 (7.05%) patients had hypothyroidism.

Conclusion: Women with hypothyroidism identified during pregnancy have an increased risk for severe Preeclampsia.

Keywords: Hypothyroidism, Preeclampsia, eclampsia, blood pressure, pregnant women.

Introduction

Hypertension in pregnancy are associated with significant maternal and perinatal morbidity and are second leading cause after embolism of maternal mortality.[1] They complicate approximately 12% - 22% of all pregnancies. Preeclampsia is related to pregnancy only and is a principal cause of maternal and fetal morbidity and mortality.[1, 2] Preeclampsia is estimated to affect 8 370 000 women every year in the world. It occurs in 6 to 8 per cent of pregnant women worldwide 5 and responsible for 10–15%of maternal death.[3-7]

Preeclamptic pregnancies have 1.5 to 2 fold increase risk of infant mortality in comparison to normal pregnancies.[7, 8] Even mild to moderate cases of preeclampsia lead to complications like low birth weight, prematurity, stillbirth and intrauterine growth retardation.[9]

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It has been recognized that although pregnancy is associated with mild hyperthyroidism but high incidence of hypothyroidism has been observed in pregnancies complicated with pre-eclampsia.[10] In one study, no significant difference was observed in serum T3, T4 and TSH levels were observed between pre elampsia and eclampsia groups[11] and the same was reported by Gulaboglu et al.[12] However, Van der Zanden et al reported hypothyroidism in 19.6% of women with pre-eclampsia.[13] In another study by Männistöa T et al, Hypothyroidism was observed in 4% of women with pre-eclampsia.[14] In another study, a positive correlation was observed between biochemical hypothyroidism and severity of pre-eclampsia and in the same study a significant difference was observed in serum T3 levels between pre-eclampsic and normotensive women ($p < 0.001$).[15]

The current research is intended to determine the frequency of hypothyroidism among women with pre-eclampsia. The literature suggested that thyroid dysfunction does occur during pregnancy and it can lead to bad maternal and fetal outcome including pre-eclampsia. The results of previous literature suggest that there might be some geographical differences in the relationship between hypothyroidism and pre-eclampsia as the results of different studies are not

consistent with each other. The results of this study will give us with local magnitude of frequency of subclinical hypothyroidism among women with pre-eclampsia and if found to be significantly high, we will share the results of this study with local obstetricians and will suggest more studies regarding association between hypothyroidism and pre-eclampsia before making future suggestion.

Material and Methods

This descriptive cross-sectional study was competed in Department of Gynecology, Khyber Teaching Hospital Peshawar from May 2018 to November 2018. A total of 369 patients of pre-eclampsia were included in study by non-probability consecutive sampling using 4 % prevalence of hypothyroidism in pre-eclampsia with 95 % confidence level and 2 % margin of error. All pre eclamptic women presenting after 20-28 weeks of gestation of any gravidity and parity having age group 15 to 45 years were included. Those patients who were using levothyroxine, having multiple pregnancies, history of diabetes, major medical or metabolic disorder, severe anemia or malnourishment were excluded from study. The study approval was taken from institutional ethical research board and patient were selected from OPD of OBS/GYN department. An informed consent was taken from patients and their demographic information was recorded based on history, examination and past investigations. All patients were subjected to blood pressure measurement and quantification of proteinuria using 24 hour urine collection or dip stick method. Once the patients were confirmed to have preeclampsia blood was taken for free T4 and TSH to detect hypothyroidism.

All the patients were managed under the supervision of an expert obstetrician having minimum of five years of experience. The relevant laboratory tests were done by same hospital laboratory under supervision of an expert pathologist having minimum of five years of experience.

All this data were recorded on a specially designed proforma. Confounding factors and bias were controlled by strictly following exclusion criteria. All the data were analyzed in SPSS version 16. Mean + SD were calculated for numerical variables like age, gravidity and parity. Frequencies and percentages were calculated for categorical variables hypothyroidism. Hypothyroidism was stratified among age, gravidity and parity to see the effect modifications. The results were displayed in tables.

RESULTS

This was a descriptive study of 369 women presenting with Preeclampsia admitted in Obstetrics and Gynecology Department of Khyber Teaching Hospital, Peshawar. Maternal age analysis showed that 73(18.8%) were of 25 years or less, 69(18.7%) were between 26-30 years, 65(17.6%) were between 31-35 years, 83(22.5%) were between 36-40 years and 79(21.4%) of the mothers aged 41 years and older. The youngest age was 15 years and the oldest was 45 years. Mean Age was 33.02 years ± 7.50. (Table no 1). Gravidity among 369 patients was observed as 71(19.2%) patients were Primary gravid (Gravida1), 129(35%) patients were Multi gravid (Gravida 2-5) and 169(45.8%) patients were grand multigravida (Gravida 6 & above). (Table No 2). Hypothyroidism among 369 patients was observed as 26(7.05%) patients had hypothyroidism while 343(92.95%) patients were free from hypothyroidism. (Figure 4). Age wise distribution of hypothyroidism shows that hypothyroidism in old age was high as that of younger age. The patients having age less than or equal to 25 years have hypothyroidism 5.6%. Age group 26-30 years have 5.8% hypothyroidism. 31-35 years age group gave 4.6% hypothyroidism. 36-40 years age groups gave 8.4% hypothyroidism and patients having more than 40 years of age have 11.2% hypothyroidism in preeclampsia patients. (Table 4). Stratification over parity and gravid shows no evidence of statistical significance. (Table No 5).

TABLE NO: 1 Age Wise Distribution (n=369)

S.No	Age Group	Frequency	Percent
01	< 25.00	73	19.8
02	26.00 - 30.00	69	18.7
03	31.00 - 35.00	65	17.6
04	36.00 - 40.00	83	22.5
05	>41.00	79	21.4
	Total	**369**	**100.0**

Table No: 2 Gravida (n=369)

S.No	Grivida	Frequency	PERCENT
01	<=1	71	19.2
02	2-5	129	35.0
03	6+	169	45.8
Total		**369**	**100.0**

Table No: 04 Age Wise Distribution of hypothyroidism (n=369)

Age (in years)	Hypothyroidism		Total	P value
	Yes	No		
<= 25.00	4 5.6%	68 94.4%	72 100.0%	0.518
26.00 - 30.00	4 5.8%	65 94.2%	69 100.0%	
31.00 - 35.00	3 4.6%	62 95.4%	65 100.0%	
36.00 - 40.00	7 8.4%	76 91.6%	83 100.0%	
41.00+	9 11.2%	71 88.8%	80 100.0%	
Total	27 7.3%	342 92.7%	369 100.0%	

DISCUSSION

Patients with preeclampsia have high probability of hypothyroidism and that may have correlation with severity as well.[16] The mechanism of hypothyroidism in preeclamptic women is not known, but high circulating estrogen can be the reason for changes in thyroid function during pregnancy. [17] Preeclamptic Women have high TSH level. Preeclamptic women have higher incidence of high TSH and low T4 level in comparison to normal pregnant women. [18] this elevation can be explained by elevation of the placental thyrotropic like peptide and increasing quartiles of pre-delivery soluble fms-like tyrosine-kinase level.[18]

The frequency of hypothyroidism in our study was 7.3 % which is in contrast to a study conducted in Christian medical college vellore in 2018 which showed 29.3 % prevalence of hypothyroidism in pregnant female with pre-eclampsia.[19] The results of our study showed higher TSH level which is consistent with other studies.[20] other studies have shown that women with preeclampsia have increased angiogenic factors which reduces production of nitiric oxide and thus reduces capillary blood flow. This can lead to reduce production of thyroid hormones.[21]

There may be a reciprocal relation between thyroid function and preeclampsia.[22] Means that one of the cause of preeclampsia may be thyroid dysfunctions[23] and hypothyroidism is one of the pathophysiologic causes of preeclampsia.

Some investigators have shown a relationship between maternal and fetal complications and thyroid dysfunction.[24] therefore obstetrician should recommend thyroid function test to pregnant women for early diagnosis,

especially in pre-eclamptic women[25] and treatment to prevent further complications.

Present study has the strength of being the first of its kind in local population. The limitation of the study is that the prevalence was low in comparison the other studies. For that we need to do further studies to find out the odds of preeclampsia. Fortunately, thyroid function test is easily available and cheap investigation and it should be recommended to all preeclamptic pregnant women.

CONCLUSION

It is necessary to evaluate thyroid functions before starting drugs to the patients with preeclampsia by taking account of the large population of pregnant women, because many of these have no specific clinical complaints or signs of hypothyroidism. A misdiagnosed hypothyroidism may increase the risk of treatment which could be a further reason to diagnose hypothyroidism early in these patients.

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