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Original Article

Frequency Of Hypothyroidism In Pregnant Women Visiting Antenatal OPD In A Tertiary Care Hospital

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ABSTRACT

Objectives: - To determine the frequency of hypothyroidism in pregnant women visiting Outpatient Department (OPD) for antenatal care in a Tertiary Care Hospital. **Settings: -** Department of Gynecology and Obstetrics unit II Civil Hospital Karachi. **Duration: -** Six months from 01/10/2016 to 31/03/2017 **Study Type: -** Cross sectional study. **Subject and Methods:** A total of 136 pregnant women from weeks 8 to 40 weeks of pregnancy on first antenatal visit were selected in this study. Venous blood sampling of the patients were done for thyroid hormones test. All information was recorded on a predesigned proforma. **Results: -** The average age of the women was 28.07±4.57 years. Frequency of hypothyroidism in pregnant women was observed in 19.12% (26/136). **Conclusion:** This study showed a high prevalence of hypothyroidism in pregnant women. Due to the immense impact that the maternal thyroid disorder has on maternal and fetal outcome, prompt identification of thyroid disorders and timely initiation of treatment is essential. Thus, universal screening of pregnant women for thyroid disorder should be considered especially in a country like ours where there is a high prevalence of undiagnosed thyroid disorder.

KEY WORDS: Hypothyroidism, Pregnancy, Endocrinological problem

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INTRODUCTION

The role of thyroid gland in pregnancy and its disorders adversely affecting mother and the development of off spring has attracted much interest recently in general as well as in the medical society[1].Disorders of Thyroid gland is the second most common endocrinological problem encountered during pregnancy after diabetes[1]. Thyroid disorders are treatable and

require prompt diagnosis and evaluation so that appropriate timely management be initiated to prevent adverse effect on both mother and the fetus.[1,2]

The hypermetabolic state of pregnancy causes physiological changes in thyroid gland size as well as in its function.There is a 10% increase in gland size in iodine sufficient countries and 20-40% in countries found deficient in iodine.[3] Production of thyroid hormones and iodine requirement both increases by approximately 50% during pregnancy by stimulation of thyrotropin (Thyroid stimulating hormone) receptor by human chorionic gonadotropin and two fold increase in thyroxine binding globulin by an increase in estrogen with a resultant increase in total thyroid hormone in the first half of pregnancy which plateaus around 20 weeks of geatation.[3,4] During first trimester fetus depends on maternal supply of thyroid hormone through placenta. At around 12 - 14 weeks the baby's thyroid begins to function.[5]

Thyroid disorders are observed in around 1% to 2% of reproductive age women.[4,6,7]The prevalence of hypothyroidism during pregnancy, including both sub clinical (2-3%) or overt hypothyroidism (0.3-0.5%), is more than hyperthyroidism (0.1-0.4%) as reported in western literature[8], whereas in an Indian study prevalence of hypothyroidism is 9.8%.[1]Most common cause of hypothyroidism in iodine deficient areas is iodine deficiency and in iodine sufficient areas autoimmune disorder Hashimoto's thyroiditis is the most common cause[7].similarly under treatment for hypothyroidism or over treatment with antithyroid medications for hyperthyroidism also causes hypothyroidism.

Untreated hypothyroidism is associated with adverse outcomes in the mother and fetus, maternal effects include anemia, myopathy, congestive cardiac failure, eclampsia, pre eclampsia, placental abruption and post partum hemorrhage.[7,10,11] The fetal effect include impaired neurological development , recurrent miscarriage, preterm delivery, low IQ among children born to hypothyroid mothers [4,7,9, 10,]

Aim of study is to determine the frequency of hypothyroidism in pregnant women as wide variation is observed in frequency of hypothyroidism in pregnancy ranging from 2.5%[4] in west to 11%[1] in indian population.The study was carried out to determine the actual burden of disease in our population.

OBJECTIVES

The objective of this study is to determine the frequency of hypothyroidism in pregnant women visiting Outpatient Department (OPD) for antenatal care.

OPERATIONAL DEFINITIONS

Hypothyroidism

Maternal hypothyroidism is defined as the presence of an elevated Thyroid- Stimulating Hormone (TSH) concentration during Pregnancy. (Cut off level 0.1 – 2.5mlU/ml, 0.2 – 3mlU/ml, 0.3 – 3 mlU/ml for first, second and third trimester respectively) as per recent guidelines[3]. The quantification of Thyroid Stimulating Hormone was carried out with Chemiluminescence Microparticle Immuno-Assay (CMIA) method.

MATERIAL AD METHODS

Settings: - Department of Gynecology and Obstetrics unit II Civil Hospital Karachi

Study Type: - Cross sectional study.

Duration of Study: - Six months from 01/10/2016 to 31/03/2017

Sample Size

By using OpenEpi sample size calculator, taking prevalence of Hypothyroidism as **9.8%**[1] margin of error (d) **5%**, confidence interval **95%**, the estimated sample size (n) was at least **136**.

Sample Technique:-Non probability consecutive sampling

SAMPLE SELECTION

The sample was all pregnant women, visiting antenatal clinic Obstetrics & Gynecology (OPD), Civil Hospital, Karachi who fulfills the inclusion criteria.

Inclusion Criteria

- Apparently healthy pregnant women aged 18 to 45 years.
- Para 1 to 5.
- Gestational age between 8 to 40 weeks on first antenatal visit.

Exclusion Criteria

- Women who will not give consent

- History of thyroidectomy
- History of taking thyroid medications
- Known cases of TSH secreting pituitary tumor.
- Known cases of hypertension, Diabetes, Cardiac diseases, Epilepsy, TB, SLE, Hepatitis, Asthma and Kidney disease.

DATA COLLECTION PROCEDURE

The study was conducted at Gynaecology and Obstetrics Outpatient Department (OPD) of Civil Hospital Karachi. Those pregnant women who met the inclusion criteria were selected for the study. After taking informed verbal consent information regarding variables of interest i.e. age, parity, ethnicity, socioeconomic status, pregnancy trimester, family history of thyroid disorder, thyroid hormones levels was noted on an approved Proforma. Venous blood sampling of the patients was done for thyroid hormones test. About 5cc of blood was drawn by resident doctor in OPD. Sample was collected in red top bottles of Civil Hospital Karachi Central lab. Blood sample for Thyroid Function Test was sent to central lab Civil Hospital Karachi. All information was recorded on a structured proforma.

DATA ANALYSIS PROCEDURE

The data was analyzed through SPSS software version 18. Mean was calculated for quantitative variables (i.e., age, parity, and gestational age) .While frequency and percentages was calculated for qualitative variables like hypothyroidism, ethnicity, family history of thyroid disorders, and socio economic status and also for age, parity and gestational age.

RESULTS

A total of 136 pregnant women between 8 to 40 weeks of pregnancy were selected in the study on

TABLE -1
DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION n (136)

		n (136)	%age
AGE	< 20 years	4	2.9
	20-30 years	95	69.85
	>30 years	37	27.20
PARITY	1-2	75	55.15
	3-4	35	25.74
	>5	26	19.12
GESTATIONAL AGE	8-12	6	4.41
	13-26	62	45.59
	26-40	68	50.0
SOCIO ECONOMIC STATUS	Low	79	58.09
	Middle	65	40.44
	High	2	1.47
ETHNICITY	Urdu speaking	65	47.79
	Sindhi	26	19.12
	Punjabi	20	14.71
	Sariki	23	16.91
	baloch	2	1.47
FAMILY HISTORY OF			
THYROID DISORDER	positive	15	11.03

TABLE -2
FREQUENCY OF HYPOTHYROIDISM IN PREGNANCY.

	n (136)	PERCENTAGE
HYPOTHYROIDISM IN PREGNANCY	26	19.11

their first antenatal visit. Majority of the female were aged between 20 to 30 years. The average age of the women was 28.07±4.57 years. Average parity 2.521± 51 and average gestational age 29.066± 64 weeks.

Parity of the women showed 75(55.15%) had parity of1-2, 35(25.74%) were multipara and 26(19.12%) grandmultipara. Table 1

Gestational age according to trimester wise showed majority of the women 68 (50%) presented in third trimester that is from 28 weeks onwards of pregnancy. Table 1

Regarding socio economic status 79(58.09%) women belonged to low socio economic status, 55(40.44%) belonged to middle class and only 2(1.47%) belonged to high socioeconomic status. Regarding ethnicity urdu speaking community was commonly observed in this study . Family history of thyroid disorder was observed in 15 (11.03%) women. Table 1

Frequency of hypothyroidism in pregnant women was observed in 19.12% (26/136) Table 2. Out of these 26 hypothyroid women twelve (46.15%) were found anemic, seven (26.92%) had preeclampsia, four (15.38%) had gestational diabetes, two(7.69%) women were hepatitis B reactive and one (3.85%) had hepatitis C. The fetal outcome showed four (15.38%) were low birth weight babies that is weight d" 2.5 kg, two (7.69%) delivered preterm babies that is born before 37 completed weeks of gestation and two (7.69%) women had good size babies having birth weight e" 3.5 kg.

DISCUSSION

Pregnancy is a stressful condition for the thyroid gland resulting in hypothyroidism in women with limited thyroid reserve or iodine deficiency. Untreated hypothyroidism can affect the pregnancy and the neonate in an adverse fashion; though hypothyroidism when adequately treated and monitored had good maternal and fetal outcome. Thyroid disorder may be overlooked in pregnancy because of nonspecific symptoms and physiological changes of pregnancy can simulate thyroid disease.

Mean gestational age in our study is 28.07±4.57 years whereas mean age at presentation is 25.19±4.17 years in a study by Nambiar V et al [11]compared to27±6 years as reported by a western study[12]

The frequency of hypothyroidism in pregnant women in our study is 19.12%. Prevalence of thyroid disorder during pregnancy has a wide geographic variation. Western literature shows a prevalence of hypothyroidism in pregnancy of 2.5% [4]and hyperthyroidism in pregnancy has prevalence of 0.1 – 0.4%.[12] A study carried out by Elahi *et al*.,[13] in Lahore, Pakistan revealed that about 79.8% of the pregnant mothers are found to be iodine deficient, out of which 24.7% are moderately deficient in iodine which predisposes the mothers and their neonates to develop iodine deficiency thyroid disorders. In a study conducted by J Nath et al.[14]the prevalence of thyroid disorder was less, about 6% with overt hypothyroidism in 2.5% and in the study conducted by Rajput, et al.[15] the prevalence of thyroid disorder was found to be high (21.5%) women having subclinical hypothyroidism and 1.3% had overt hypothyroidism and is not comparable with the present study. Similarly, in a community-based large-scale study involving over 500,000 pregnant women from the USA showed a 15.5% prevalence of hypothyroidism.[16]Previous studies conducted in Delhi reported a 14.3% prevalence of hypothyroidism during the first trimester[17]with majority having subclinical hypothyroidism.In another study, Sahu *et al*. have done thyroid function during the second trimester in high-risk pregnant women and reported that prevalence of thyroid disorders, especially overt and subclinical hypothyroidism was 6.47%.[18]

Prevalence of hypothyroidism during pregnancy

has a wide geographical variation. It is more in Asian countries compared to the west.[19]In Indo Pak region, the prevalence of hypothyroidism in pregnancy is much higher compared to western countries. Prevalence varies widely among various parts of Pakistan, as we still face iodine deficiency in many parts of the country. Since Pakistan is considered an iodine deficient country in the domain plus an iodine deficient Pakistani diet[90] puts the Pakistani population particularly the pregnant mothers at risk of developing moderate to severe iodine deficiency resulting in maternal hypothyroidism and fetal consequences.

In our study family history of thyroid disorder was present in 11 % of women whereas study by W Wang et al[19] showed positive family history of thyroid disorders in 6% of women.

In our study 26.92% hypothyroid women had pre eclampsia which is comparable to 22% in a study by Leung AS[22] et al. Study by P Joysee et al,[23]showed anemia in 11.1% whereas in our study 46.15% of hypothyroid women were found anemic, study by Nelson DB et al[24]showed increased likelihood of gestational diabetes with p- value 0.291 and our study showed 15.38% of hypothyroid women had gestational diabetes.[23]Regarding adverse fetal outcome preterm delivery was observed in 7.69% in our study which is comparable to 5.2% by P Joysee et al

The strong point of this study is that all the samples have been analyzed at the same laboratory. Further, the study population belongs to different socioeconomic strata and ethnicities hence representing pregnant population of Pakistan. However, there are a few limitations of this study. We have not carried out clinical and radiological thyroid examination including ultrasound, and have not evaluated different causes of hypothyroidism in these women.

CONCLUSION

This study showed a high prevalence of hypothyroidism in pregnant women. Due to the immense impact that the maternal thyroid disorder has on maternal and fetal outcome, prompt identification of thyroid disorders and timely initiation of treatment is essential. Thus, universal screening of pregnant women for thyroid disorder should be considered especially in a country like ours where there is a high prevalence of undiagnosed thyroid disorder.

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