Original Article

Frequency and Association of Subclinical Thyroid Disorders with Poor Obstetric Outcome

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ABSTRACT

Objective: To determine the frequency and association of subclinical thyroid disorders in patients with poor obstetric outcomes.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Department of Obstetrics and Gynecology, Lady Reading hospital Peshawar from August 2019 till July 2020.

Materials and Methods: Women of reproductive age with a bad obstetrical history during her visit in the outpatient department of the hospital were enrolled. Obstetrical details including previous miscarriages, stillbirths, neonatal deaths and congenital anomalies were recorded by interviewing the patient as per questionnaire. patients fulfilling the inclusion criteria were subjected to thyroid function tests. Data was analyzed on SPSS version 18.

Results: Out of the 549 women presenting with a poor obstetric outcome, 103women were recruited for the study. subclinical thyroid disorders were found to be 24.27%, with subclinical hypothyroidism more prevalent (21.35 %) in patients with poor obstetric outcome. significant weak positive correlation was reported between neonatal deaths and TSH levels (r= 0.200; p= 0.043).

Conclusion: Subclinical thyroid dysfunction is more prevalent in patients with poor obstetric outcome. various adverse fetal and neonatal outcomes are expected to be encountered in patients with subclinical thyroid dysfunction.

Key Words: Subclinical hypothyroidism, thyroid stimulating hormone, miscarriage, stillbirth

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INTRODUCTION

Thyroid hormones have an important role in neurophysiologic development of the fetus. Subclinical thyroid dysfunction implicates an abnormal serum thyroid-stimulating hormone level (normal TSH reference range: 0.45 to 4.5 μU per mL) in clinically asymptomatic patient. Serum TSH 0.1-0.45 mIU/L will denote subclinical hyperthyroidism and serum TSH 4.5-10.0 mIU/L will demarcate as subclinical hypothyroidism. Some studies recommend against routine treatment of patients and free thyroxine(T4) and triiodothyronine(T3) levels within their normal ranges[1]. thyroid disease represents the second most recurrent endocrine condition that might affect females in the reproductive age[2].

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The risk of hypertension, miscarriages, fetal growth restriction, abruption and preterm births has been increased if thyroid disorder is not treated in pregnancy[3].In order to reduce these risks, Screening has to be performed during the first trimester of pregnancy. It has been recommended by American Association of Endocrinologist, but European and American Thyroid Association experts do not recommend the universal screening of all pregnant population, though testing in case of high risk is suggested[4]. Females with the history of stillbirth, neonatal death, three or more abortions are considered as poor obstetrical history[5]. The causes of poor obstetric outcome are varied including diabetes, hypertension anaemias, uterine factors, cervical incompetence, prelabour ruptured membranes, antepartum hemorrhage or intrapartum adverse incidents. Some studies revealed an association of these poor obstetric events with subclinical hypothyroidism or thyroid autoimmunity[6]. Others have reported a relationship with a higher rate of stillbirth in the second trimester of pregnancy with subclinical hypothyroidism[7].

The present study is, therefore, being conducted to assess the frequency and association of subclinical thyroid dysfunction with obstetric outcomes in women of reproductive age group and to evaluate patients with poor obstetrics outcome for any underlying subclinical thyroid dysfunction.

MATERIALS AND METHODS

This cross sectional study was done at the department of obstetrics and gynecology, Lady Reading hospital Peshawar over one year from August 2019 till July 2020.

Patients were selected by non-probability convenient sampling after taking ethical approval from the institutional review board of the hospital. Women of reproductive age who had a previous history of poor obstetric outcome were included in the study. Patients with any underlying comorbidities such as diabetes, hypertension which per se would increase likelihood of increased fetal and perinatal mortality and in turn lead to poor obstetric outcome were excluded from the study. clinically proven thyroid disorders, previous history of thyroid surgery was also excluded from the study.

After informed consent detailed history was taken regarding maternal age, parity, previous miscarriage, still births and early neonatal deaths etc., as per attached questionnaire. Blood samples were then taken for thyroid hormones i.e. thyroxin(T4) and thyroid stimulating hormone (TSH) levels on their visit in the outpatient department. Patients were also inquired about personal and family history of thyroid disease; those patients who come up with deranged TFTS (thyroid function tests were thus retrospectively diagnosed to be have subclinical thyroid dysfunction which led to a poor obstetric outcome.

Data analysis: The collected data was entered into SPSS version 18.0 and analyzed. Descriptive statistics were presented as frequency and percentages and were calculated for qualitative variables. Pearson correlation was applied to assess the association. P-values less than 0.05 were considered as a level of significance.

RESULTS

Out of the 549 women presenting with a poor obstetric outcome, 446 women had known risk factors for their poor obstetric outcome. These patients were thus excluded. Rest of103 without any identifiable cause for their bad obstetric history were enrolled for the study. The mean age was noted to be 28.94±4.07years. Mean parity was 3.47±1.70 in which 7(6.8%) were nulliparous (although they had recurrent miscarriages) whereas 96 (93.2%) were multiparous women, (as shown in Table-1).

48(46.6%) had 2 miscarriages. 38 (36.9%) of them had previous 1 still birth. 10 (9.7%) women had a history of abnormal babies, 6 (5.82%) had babies with cerebral palsy (CP), 2(1.94%) women had 2(1.94%) growth retarded child births, whereas 2 (1.94%%) had congenitally abnormal baby with one having skeletal dysplasia and other having polydactyly. 27 (26.2%) had previous 1 neonatal death.

78(75.5%) patients had normal thyroid function tests. Frequency of subclinical thyroid disorders was found to be 24.27% out of which subclinical hypothyroidism was found in 22 (21.35 %) who have normal T4 levels but elevated TSH, whereas subclinical hyperthyroidism in 3 (2.9%) patients with poor obstetric outcome. (As shown in Table-2)

Table No.1: Maternal demographic characteristics and variables of poor obstetric outcome

Variable	Mean±SD
Age (years)	28.94±4.07
Parity	3.47±1.70
Miscarriages	2.37±1.2051
Stillbirths	0.65±0.73
Neonatal Deaths	0.32±0.52

Table No.2: Adverse fetal outcomes of maternal thyroid dysfunction.

Variables of poor obstetric outcome		Number of patients	%tage
Previous Miscarriages	1 miscarriage	10	9.7
	2 miscarriage	48	46.6
	3 miscarriage	26	25.2
	4 miscarriage	7	6.8
	5 miscarriage	3	2.9
	6 miscarriage	3	2.9
	No miscarriage	6	5.8
Previous Still Births	1 Still Birth	38	36.9
	2 Still Births	13	12.6
	3 Still Births	1	1.0
	No Still Births	51	49.5
Abnormal Babies	No abnormality	93	90.29
	Cerebral Palsy.	6	5.82
	Growth Restriction	2	1.94
	Congenital anomaly	2	1.94
Previous Neonatal Deaths	1 Neonatal Death	27	26.2
	2 Neonatal Deaths	3	2.9
	Nil	73	70.9

Table No.3: Correlation of demographic variables and obstetric outcomes with TSH levels.

Variable	TSH Levels	
	P	p-value
Age (years)	-.057	0.564
Parity	0.058	0.559
Miscarriages	0.016	0.874
Still Births	0.037	0.713
Neonatal Deaths	0.200	0.043

An insignificant correlation for TSH levels was reported with age (r= -0.057; p=0.564), an insignificant correlation was reported with parity (r=0.058; p=0.559), with miscarriages (r= 0.016; p=0.874), with stillbirths (r= 0.037; p= 0.713) whereas a significant weak

positive correlation was reported between neonatal deaths and TSH levels (r= 0.200; p= 0.043), as shown in Table 3.

Table No.4: - TSH Levels of patients presenting with poor obstetric outcome

TSH Levels	Number of patients =N	Percentage (%)
Reduced(hyperthyroid)	3	2.9
Normal (euthyroid)	78	75.7
Increased(hypothyroid)	22	21.4
MeanTSH Values	3.34±2.26	

DISCUSSION

Thyroid dysfunction is the second most common recurrent endocrine disorder faced by 2 to 3% of women during pregnancy[8]. Adverse or poor obstetrics outcome as detected in overt hypothyroidism may also be encountered in subclinical hypothyroidism. Our study showed prevalence of subclinical hypothyroidism in patients with poor obstetric outcome to be 21.4% whereas subclinical hyperthyroidism was observed in 2.9% cases which shows a relatively higher percentage of subclinical hypothyroidism in patients with poor obstetric outcome. Subclinical thyroid dysfunction in females in reproductive age group fluctuates from 2%-10%[9,10]. A study conducted in Jordan showed 3% pregnant women to have hypothyroidism during pregnancy[11]. A much higher prevalence of subclinical hypothyroidism 65.2%in pregnant women with a bad obstetrical history was revealed by a study[12].The reason could be the iodine deficiency in the population which is unmasked and potentiated in a physiologically hyperactive thyroid gland in pregnancy.

The effects of Subclinical (SC) thyroid dysfunction on poor obstetrics outcome have still not been clearly known. Certain studies[13] reported that SC Hypothyroidism did not lead to any consistent adverse maternal and prenatal outcomes, while other showed that SC Hypothyroidism is associated with a number of obstetric complications, which include abruption of placenta, GDM, and IUGR[14]. Our results showed a weak positive significant correlation between TSH levels with neonatal deaths (r= 0.200; p=0.043) while insignificant association was observed in terms of miscarriages, parity and still births.

Women with hypothyroidism were more prone to miscarriages during their first trimester, which is comparable to the outcomes of earlier studies. Our study results were in agreement with the above mentioned studies and revealed that 48(46.6%) had 2 miscarriages during pregnancy whereas 26(25.2%) had 3 miscarriages but there was an insignificant association between miscarriages and TSH level (p=0.874).

A study by Su and colleagues[15] showed greater risks of deformities of circulatory system (11.1%) and musculoskeletal (4.7%) in fetuses of women with hypothyroidism. As far as our study is concerned, it is in compliance with the above mentioned studies in way that maternal thyroid disorder led to deliver abnormal babies as skeletal dysplasia and polydactyly were noted in 1.94%. Moreover, our results have shown Cerebral Palsy in 5.82% and growth retarded babies were reported in 1.9% cases of subclinical thyroid dysfunction

Study by Casey as mentioned earlier demonstrated that the rate of stillbirth was more among those women with SCH than women with euthyroid in the second trimester, but no statistically significant differences were seen. Though higher rate of stillbirth in women with hypothyroid with TSH levels 0.10mU/L has been earlier stated, SCH (described by much lesser amount of TSH levels) appears to have small impact on stillbirth[16].Our findings are in agreement with those reported in the literature and indicated that stillbirth rate was higher in women hypothyroidism 38(36.9%) but there was an insignificant correlation observed between stillbirth and TSH levels. (r= 0.037; p= 0. 713. Therefore, thyroid screening in women with poor obstetric outcome may be useful to predict its prior incidence. Further, timely management of subclinical thyroid dysfunction might reduce the morbidity and mortality related to poor obstetric outcome.

CONCLUSION

Various adverse fetal outcomes can be correlated with subclinical thyroid dysfunction in patients with poor obstetrical history. Subclinical hypothyroidism in reproductive age group may increase the risks of miscarriages and neonatal deaths.

Recommendations: Routine screening of women with poor obstetric outcome is essential to rule out subclinical thyroid dysfunction to improve fetal and perinatal outcome.

Author's Contribution:

Concept & Design of Study:	Sumaira Yasmin
Drafting:	Farnaz Zahoor
Data Analysis:	Farnaz Zahoor
Revisiting Critically:	Sumaira Yasmin, Farnaz Zahoor
Final Approval of version:	Sumaira Yasmin

Conflict of Interest: The study has no conflict of interest to declare by any author.

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