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Original Article

To study the profile of thyroid function in pregnancy and its correlation with the maternal & fetal outcome

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ABSTRACT

Objectives: To study the status of thyroid dysfunction in pregnancy and evaluate the maternal & fetal outcome Methods: Prospective study over a period of 12 months. 300 consecutive pregnant females were included in the study 37 of these formed the study group while 263 formed the control group. Subjects in the study group were given appropriate treatment for thyroid dysfunction and the maternal and fetal outcome were recorded. Results: 12.33% pregnant females were diagnosed with thyroid disorder 91% of these were hypothyroid. Most common maternal complication/risk factor observed in the study group was previous abortion followed by infection, PIH, anaemia placental abruption & PPH. The most frequent fetal complication/ risk factor were higher incidence of LSCS, low birth weight, prematurity & IUGR. Conclusion: The incidence of thyroid disorders in pregnancy is significantand these disorders adversely affect the maternal & fetal outcome so timely recognition & management of these disorders can improve the maternal & fetal outcome

1. Introduction

About 200 million people in the world have some form of thyroid disease [1]. Thyroid disease burden in India is nearing almost 60 million which is almost double size of the diabetic epidemic. The estimated population at risk for Iodine deficiency disorder in India is 270 million people [2]. The incidence of overt hypothyroidism in pregnant women is 0.05% and those with subclinical hypothyroidism are 2% of all pregnancies. The incidence of hyperthyroidism is 0.05-0.2% [3].

Thyroid dysfunction is often overlooked in pregnant women because of nonspecific symptoms and the hypermetabolic state of normal pregnancy. Compounding the diagnosis further is the alteration in thyroid physiology that normally occurs during pregnancy.

Maternal hypothyroidism is associated with an increased risk of Pregnancy-induced hypertension, placental abruption, Spontaneous abortion, fetal distress, perinatal death, Preterm birth, and Low birth weight [4, 5].

The present study assumes significance because few data are available from India about the status of thyroid dysfunction in pregnancy. No such study has been conducted in the state of Uttarakhand and these disorders are known to be associated with abnormal fetal and maternal outcome.

Methods

The present study was conducted in the Department of Obstetrics and Gynaecology at Himalayan Institute of Medical Sciences Dehradun over a period of 12 months.

The study was a prospective one year trial and included consecutive pregnant females attending the department of Obstetrics & Gynaecology.An informed consent was taken in all cases.

All the cases included in the study were subjected to thyroid function test [TSH]. Those with abnormal TSH were further subjected to FT3, FT4 . A detailed clinical history was taken in all cases with special emphasis on previous thyroid disorder. Those already suffering from thyroid disorder were evaluated for the type of medication or any other treatment modality. They were also evaluated for any significant obstetric history and fetal loss in the past. They were subjected to detailed general and obstetrical clinical examination. Those with normal thyroid functions were

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categorized in group A and those with abnormal functions were placed in group B. Group A acted as control group. The patients in group B were separately evaluated by a medical consultant and the disorders were managed accordingly. These patients were followed as per the antenatal protocol of the department of Obstetrics & Gynaecology. They were further followed up after the delivery and free FT_3, FT_4& TSH were repeated within 6 weeks after delivery.

Results

Table 1 shows that mean age of the subjects in the study group was 26.7 yrs and the mean duration of pregnancy at the time of presentation was 16.92 weeks. The mean TSH in the study group was 5.2 µIU/ml, mean T3 was 2.41 pg/ml and mean T4 was 1.24 ng/dl. Mean APGAR Score at 1 min was 7.66 at 5 min it was 8.90 and at 10 min 8.58.

Table 2 shows that mean age of the subjects in the control group was 26.6 yrs and the mean duration of pregnancy at the time of presentation was 17.01 weeks. The mean TSH in the control group was 2.4 µIU/ml, Mean APGAR Score at 1 min was 7.8 at 5 min it was 8.87 and at 10 min 9.60.

Table 3 shows that 34 patients presented with hypothyroidism 28 of these were overtly hypothyroid while 6 were subclinicaly hypothyroid. Post delivery 30 of these patients wereeuthyroid but 4 patients were still subclinicaly hypothyroid.

3 patients presented with hyperthyroidism 1 was overtly hyperthyroid and 2 were subclinicaly hyperthyroid. 1 patient was subclinicaly hyperthyroid even after delivery.

Table 4 shows that 14 patients in the study group had history of abortion, 6 patients had PIH,10 patients had history of thyroid disorders. Among the fetal complications 3 patients had IUGR, 8 were born premature. 16 of these patients had LSCS. 5 new borns needed NICU care. 11 babies had low birth weight.

Table 5 shows that in the control group 68 patients had history of abortion, 26 patients had PIH. Among the fetal complications 15 had IUGR, 31 IUFD, 43 were premature, 117 patients underwent LSCS, 110 babies had low birth weight.

Table – 1
Baseline characteristics of the study group N=37

Parameters	Mean±SD
Mean age SD	26.7 yrs ± 3.86
Mean duration of pregnancy at the time of presentation SD	16.92 weeks ± 10.47
Mean TSH SD	5.21 µIU/ml ±11.52
Mean T3 SD	2.41 pg/ml ±1.13
Mean T4 SD	1.24 ng/ml ±2.51
Mean APGAR score 1 Minutes 5 Minutes 10 Minutes	 7.66 ±1.14 8.90 ±0.68 8.58 ±0.54

Table – 2
Baseline characteristics of the Control group N=263

Parameters	Mean±SD
Mean age SD	26.6 yrs ±4.05
Mean duration of pregnancy at presentation	17.01±4.1weeks
Mean TSH SD	2.4µIU/ml ±5.22
Mean APGAR score 1 Minutes SD 5 Minutes SD 10 Minutes SD	 7.8 ±1.53 8.87 ±0.79 9.60 ±0.61

Table – 3 Profile of thyroid function in the study group

	1st visit (Before delivery)		2nd visit (After delivery)	
	Number	Percentage %	Number	Percentage %
A Hypothyroidism (N=34)				
Overt	28	82.53	0	0
Sub-clinical				
Euthyroid	6	17.64	4	11.76
B Hyperthyroidism (N=3)	0		30	88.23
Overt	1	33.33	0	
Sub-clinical	2	66.66	1	33.33
Euthyroid	0		2	66.66

Table – 4 Profile of risk factors/ Complications in the study group N=37

Risk factor/ Complication	No.	Percentage%
Maternal		
H/O Abortion	14	37.84
PIH	6	16.22
Infection	11	29.73
Anemia	2	5.41
Placental Abruption	2	5.41
Fetal Tachycardia	1	2.7
PPH	1	2.7
Previous thyroid disorder	10	27.02
History of autoimmune disorder	2	5.41
Fetal	3	8.11
IUGR	0	0
IUFD	8	21.62
Prematurity	16	43.24
Mode of delivery	21	56.76
LSCS	5	13.51
ND	11	29.73
Admission to NICU	0	0
Low birth Weight	1	2.70
Still Birth		
Congenital anomaly		

Table – 5 Profile of risk factors/ Complications in the Control group N=263

Risk facture/ Complication	No.	Percentage%
Maternal		
H/O Abortion	68	25.86
PIH	26	9.89
Infection	8	3.04
Anemia	8	3.04
Placental Abruption	0	0.00
Fetal Tachycardia	3	1.14
PPH	0	0.00
Fetal IUGR	15	5.70
IUFD	31	11.79
Prematurely	43	16.35
Mode of delivery		
LSCS	117	44.49
ND	146	55.51
Admission to NICU	5	1.90
Low birth Weight	110	41.83
Still Birth	1	0.38
Congenital anomaly	1	0.38

Discussion

The thyroid disorder are the second most common endocrine disorder affecting women of reproductive age groups [6].These disorder of thyroid hormone production can affect fertility, maternal morbidity and fetal growth and development [7]. On closely scrutinizing the data the mean TSH in the study group was found to be 5.21iu/ml ± 11.52 suggesting maternal hypothyroidism to be predominant in the present study. In their studies Casey B.M et al (2005) [8] and Man E.B.et al (1991) [9] have convincingly established that hypothyroidism in pregnancy is detrimental to the developing fetal brain; Several studies since 1990 have shown that even mild thyroid hypofunction during pregnancy affects brain development in utero and seems to be associated with abnormal pediatric outcome.

Table3 highlights the profile of thyroid functions in the study group. Majority of the subjects in the study group had hypo function 34 out of 37(91.89%), out of which 28 had overt (82.53%) hypothyroidism and 6 had subclinical (17.64%) form of hypothyroidism. On treating this group or adjusting the dose of medicine till term 30 (88.3%) patients became euthyroid in the next follow visit after delivery while the remaining 4 (11.7%) had converted to subclinical hypothyroidism. 3 patients out of 37 (8.10%) had hyperthyroidism out of which 1 had overt hyperthyroidism while 2 had subclinical hyperthyroidism. All these 3 patients were investigated further and evaluated & were treated accordingly. At the follow up visit after delivery 1 had subclinical hyperthyroidism while the 2 reverted to euthyroid state. It is imperative to realize that 5 subjects (13.5%) still had dysthyroid state in the post partum period.

Table4Depicts the profile of maternal and fetal factors. On analyzing the maternal factors, a large number had history of abortion followed by infections and history of thyroid disorder in the past. Few patients had anemia, placental abruption, history of autoimmune disorder, fetal tachyardia and PPH. The adverse fetal factors considered in the study included lower segment caesarian section done in 43.24%, LBW in 29.73%, NICU admission in 13.51%, prematurity in 21.62% & intra uterine growth retardation in 8.11%. One child had congenital anomaly. On comparing this data with control group (n=263) there was lesser history of abortion, pregnancy induced hypertension, infections, anemia& fetal tachycardia. Amongst fetal factor in the control group, the incidence of prematurity L.S.C.S & admission to NICU was significantly less as compared to study group.

Conclusion

The overall prevalence of thyroid disorder in pregnant females attending the tertiary hospital in Uttrakhand was found to be 12.33%. 91% (34 out of 37) of subjects had hypothyroidism, where as 8.11% had hyperterthyroidism. Most common maternal complication/risk factor observed in the study group is previous abortion followed by Infection, previous thyroid disorder, PIH, anemia, placental abruption & PPH.

The most frequent fetal risk factor/ complication observed was L.S.C.S mode of delivery, LBW, prematurity followed by IUGR.

The present study concludes that most thyroid conditions in pregnancy can be recognized, problems can be anticipated and effective treatment can be offered. The physician should be aware of the problems that can occur before, during and after pregnancy. There should be an equal concern for the meternal and fetal well being, therefore screening for thyroid functions should be judiciously offered

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