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Research Article

To study the prevalence of spontaneous abortions in pregnant women with hypothyroidism in the tertiary referral centre

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ABSTRACT

Background: The thyroid diseases are the commonest endocrine disorders affecting women of reproductive age group maternal hypothyroidism is the most common disorder of thyroid function in pregnancy and has been associated with spontaneous pregnancy loss, pre eclampsia, preterm delivery, antepartum hemorrhage, low birth weight, fetal distress and reduced intellectual function of the offspring. The objective was to study the prevalence of spontaeous abortions in the pregnant women with hypothyroidism.
Methods: All cohort cases were selected prospective from consecutive pregnant female attending the antenatal clinics of tertiary referral centre in study period of three years. FT_3, FT_4 and serum TSH were done in them and the results were compared Pregnancy specific reference ranges were also applied. The patients were divided into two groups based on time of hypothyroidism detection and diagnosis. The past history or prevalence of Spontaneous Abortions were compared in both the groups.
Results: The prevalence of hypothyroidism was 5.6% in women routine antenatal clinic which was highly significant. The prevalence of spontaneous abortion in the past in the group A was 18% as compared to 28% in group B, difference being highly significant.
Conclusions: Hypothyroidism is highly prevalent in patients who had obstetric repercussions. Early diagnosis and thyroxine replacement can prevent complications in the future pregnancies. Thyroid function tests should be included in the list of routine investigation done in an antenatal mother and should become a mandatory investigation in patients with previous adverse pregnancy outcomes.

Keywords: Hypothyroidism in pregnancy, Subclinical hypothyroidism, Spontaneous abortion

INTRODUCTION

Thyroid diseases are the commonest endocrine disorders affecting women of reproductive age group and hence constitute the commonest endocrine disorder in pregnancy also. It has long been recognized that maternal thyroid hormone excess or deficiency can influence the outcome for mother and fetus at all stages of pregnancy as well as interfere with ovulation and fertility.[1,2] Maternal hypothyroidism is the most common disorder of thyroid function in pregnancy and has been associated with spontaneous pregnancy loss, pre eclampsia, preterm delivery, antepartum hemorrhage, low birth weight, fetal distress and reduced intellectual function of the offspring. Thyroid dysfunction is often overlooked in pregnant women because of the nonspecific symptoms and hypermetabolic state of pregnancy. Hence thyroid function tests become essential to know the thyroid status in pregnancy.[3]

METHODS

Place of study: The study was conducted at Tertiary Medical Referral Centre for three years.

Total number of cases: Cases studied were 100.

The study was designed as a prospective cohort and was carried out from December 2012 to November 2014 in a private tertiary care teaching hospital. Ethics committee approval was obtained. Due to purely observational nature of the study, informed consent was not obtained. All cohort cases were selected prospectively from consecutive pregnant female in the antenatal clinics of Tertiary Referral Centre in the study period of two years.

Inclusion criteria

All the pregnant females were included irrespective of their gravid status and multiple pregnancies were also included.

They would be subjected to clinical evaluation with emphasis on the family history of thyroid disorders and obstetric history. Past history of any number of spontaneous abortions (gestational age <20 week) were studied in both groups.

Serum TSH was done in all as initial investigation and subjects were then grouped based on results.

- *Group 1:* Patient with known hypothyroidism before pregnancy.
- *Group 2:* Patient with hypothyroidism first diagnosed during pregnancy.

Once the treatment was started, TSH was repeated after 6 weeks. Fetal monitoring of the patient with thyroid disorder was done using USG every three month focusing on FHR, fetal growth, fetal movements.

The patients in both the groups were followed up till the termination or final outcome of the pregnancy. At the end of the study, the different study variables of both the groups were compared and analysed.

The results were evaluated in terms of,

- Mean age of the pregnant women in both the groups.
- Mean gestational age at presentation in both the groups.
- The prevalence of hypothyroidism in both the groups.
- The occurrence of spontaneous abortions in the past pregnancy in both the groups.

TSH was estimated by CLIA (Chemiluminescent Immunometric Assay). FT3/FT4 estimation was done by CLIA (Chemiluminescent Immunometric Assay)

Statistical analysis

The continuous variables used in the data were represented as mean (standard deviation, SD) or median (Interquartile range, IQR) while the categorical data was represented as percentages. For the comparison of continuous data. Student unpaired t test was used. For comparing the categorical variables Chi square test was used. Value of less than 0.05 is to be considered as significant.

Table 1: Trimester specific values for thyroid function tests.

	Units	1st trimester	2nd trimester	3rd trimester
TSH	µU/ml or mU/L	0.03-0.3	0.03-3.7	0.13-3.4
FT_4	ng/dl	0.86-1.77	0.63-1.29	0.66-1.12
	pmol/L	11.1-22.9	8.1-16.7	8.5-14.4
FT_3	pmol/L pg/ml	3-5.7 1.91-3.5 pg/ml	2.8-4.2	2.4-4.1

RESULTS

A total of 100 pregnant women who were hypothyroid were included in the present study and were divided into two groups as

Group A: 50 women who were already known case of hypothyroidism before pregnancy and on oral thyroid hormone supplementation.

Group B: 50 women who were diagnosed for the first time with hypothyroid on the first antenatal visit and were not on any medication before that.

Age distributions in both the groups

The maximum numbers of patients in group A were in age group 26-30 years (34%). The maximum number of patient in group B is in age group 26-30 years (46%).

The mean age of women in group A was 29.18 years. The mean age of women in group B is 26.92 years indicating younger cohort than group A.

Gestational age at the first ANC visit

The percentage of women registered for antenatal clinic for the first time before <20 week of gestation is 94% in group A and 80% in group B which is significant.

Unfortunately 20% women in the group B are registered for antenatal clinic for the first time >20 week of gestation.

Gravidity and parity of both the groups

The number of gravidity varied significantly among the both the groups.

The most common gravidity in group A was gravida 2 (34%). The most common gravidity in group B is gravida 1 (60%).

The parity also varies significantly among both the groups. Though para 1 was the most common in group A, but nulliparity was most common in group B.

Past history of abortion

Table 2: Past history of abortion in both the groups.

h/o Abortion	Group A		Group B	
	No.	%	No.	%
	9	18	14	28
P value <0.0001 so significant				

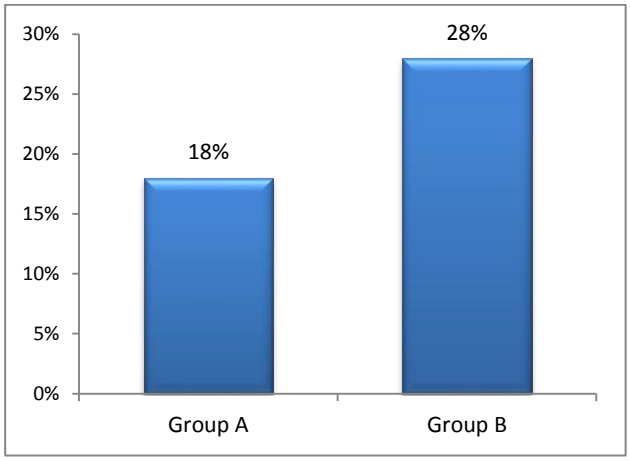

Figure 1: Past history of abortions in both the groups.

Past history of abortion was significantly higher in group A (28%) and group B (18%).

Family history of hypothyroidism

Family history of hypothyroidism is significantly higher in group A (34%) as compared to group B (20%).

DISCUSSION

Thyroid disorders are common among pregnant women. Diagnosis of thyroid dysfunction is made difficult due to the association with non-specific symptoms, hypermetabolic state of pregnancy and thyroid physiology in pregnancy which results in alteration in maternal serum TSH and thyroxine concentrations. If untreated, hypothyroidism may adversely affect the mother and fetus. Earlier studies have reported increased prevalence of congenital anomalies (10-20%), perinatal mortality (20%) and impaired mental and somatic development (50-60%) in new born of untreated hypothyroid mothers.[5,6]

Age wise distribution, mean age of the women at first ANC visit and duration of married life.

The maximum number of patients in group A is in age group 26-30 years (34%) and in group B is in age group 26-30 years (46%).

In the present study, the mean age of mother at presentation was 29.18 years in group B as compared to 26.92 years in group A which is significant indicating more young aged mothers in group I. The reason behind this can probably be explained by the fact that there are more number of the women in group B who are career oriented and working (74% in group B and 26% in group A) so ultimately delaying their mean age of first conception.

In Study by Bijay Vaidya et al in western studies mean age of mother is 27±6 yrs.[7] Similarly, in study by Negro et al in western studies mean age of mother is 29±5 years.[8]

Gestational age of mothers at first antenatal visit in both the groups

The mothers at first ANC visit in group A is at <20 weeks (82%) while in group B (66%).While group B has more women coming late (>20 weeks) in for the antenatal clinics for the first time (20%) as compared to group A (6%) probably this delayed antenatal registration putting more risk for mother and fetus. The difference is significant. The difference can probably be explained by the fact that women in group A have more awareness about the importance of early antenatal care as they are already on medication.

The gravidity and parity in both the groups

In present study, the number of gravidity varied significantly among the both the groups.

The most common gravidity in group A is gravida 2 (34%) and in group B is gravida 1 (60%).

The parity also varies significantly among both the groups. Though para 1 is the most common in group A but nulliparity is most common in group B.

Past history of spontaneous abortion

Past history of spontaneous abortions in group A (18%) and group B (28%), which is significant. This difference can probably be explained by the fact that there could be higher unawareness among them about the thyroid status in group B.

In a study by Ramchandra Rao V et al the prevalence of hypothyroidism in recurrent pregnancy loss in 1st trimester of pregnancy were 4.12%.[9]

The family history of hypothyroidism

Family history of hypothyroidism is significantly higher in group A (34%) as compared to group B (20%). The difference is significant.

The prevalence of hypothyroidism

In our hospital population of all the patients visiting the antenatal clinics when the laboratory reference range used to detect hypothyroidism, the prevalence of hypothyroidism found is 5.6%.

This incidence is much higher when compared to studies done in general population by Sharma Partha P which showed incidence of 1.15%.[10]

Another study by Cleavy and Goldman et al showed an incidence of <1% with overt hypothyroidism and 2.2% with subclinical hypothyroidism.[11] Casey et al reported in overall incidence of hypothyroidism to be 2.5%.[12]

This indicates that thyroid function screening is a necessary Investigation in patients who had a previous adverse pregnancy outcome.

In a study by Gilbert RM, the reference Intervals for TSH, FT_3, FT_4 during the first trimester of pregnancy differed substantially from that for non-pregnant women and applying the general laboratory reference range to pregnant women resulted in misclassification of Thyroid status for 20.5% of women.[13] This study established Reference Intervals derived from western Australian women.

The published trimester specific reference intervals for thyroid hormones were used in the present study. These are derived from study done by Panisar et al on pregnant women.[4]

In a Study In 2012 In North Indian population by Goel P, Kaur J, Saha PK, Tandon R, Devi L et al concluded that the overall prevalence of hypothyroidism was 6.3% (overt 2.9% and subclinical 3.4%).[14]

Table 3: Results of different studies.

Study	Country	Overt hypothyroid	Subclinical hypothyroid
Goel P et al[14]	India	2.9%	3.4%
Casey et al[12]	U.S.	0.2%	
Vaidya et al[4]	U.K.	1 %	
Cleavy and Goldman et al[11]	U.S.	0.3%	2.2%

CONCLUSION

In present study, the past history of spontaneous abortion is significantly higher in group A (18%) and group B (28%), which is significant, this difference can probably be explained by the fact that there could be higher unawareness among them about the thyroid status in group B.

In present study, the prevalence of hypothyroidism is 5.6% which is significantly higher than the non-pregnant population as was shown by Sharma Partha P showed the prevalence of 1.15%.[10]

In our hospital all mothers who attended the antenatal clinics showed the prevalence of hypothyroidism as 5.6% when the laboratory reference ranges were applied.

Hence we can conclude that thyroid disorders especially hypothyroid in Pregnancy is very important as prevalent among the study population and hence early diagnosis and timely management can be done to prevent the complications associated with present and future pregnancy.

Learning from the present study as studies done before on hypothyroidism with pregnancy, thyroid function tests should be made mandatory in the test of routine Antenatal Investigation of all mothers in ANC clinic.

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