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Original Article

Prevalence of Thyroid Disorders in Primi Pregnant Women in a Rural Teaching Hospital.

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Abstract:

Background: Evaluation of thyroid disease in pregnancy is important for gestational maternal health, obstetric outcome and development of the child. The most frequent thyroid disorder in pregnancy is maternal hypothyroidism. It is associated with fetal loss, placental abruptions, preterm delivery and reduced intellectual function in the offspring.

Materials and Methods: This study was conducted on patients attending the antenatal clinic at obstetrics and Gynecology department at MNR Medical College and Hospital over one and half year period from January 2017 to June2018 after institutional ethical committee approval. This was a hospital based prospective study done on 100 antenatal patients who fulfilled the inclusion criteria. Written informed consent was taken after explaining the nature of study and voluntary participation.

Results: Out of 100 sample cases 72 (72%) of cases were diagnosed normal, 14 (14%) of cases were subclinical hypothyroidism and clinical hypothyroidism cases were 10 (10%) and 04 (4%) cases were clinical hyper thyroid cases.

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Conclusion: The present study showed a high prevalence of thyroid disorder especially hypothyroidism in pregnant women, with the prevalence of subclinical hypothyroidism being 14%, clinical hypothyroidism being 10% and clinical hyperthyroidism being 4%. Although hyperthyroidism in pregnancy is uncommon, effects on both the mother and fetus are critical. 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 India where there is a high prevalence of undiagnosed thyroid disorder. Prompt detection and corrective treatment with thyroxin can prevent many obstetrical complications and result in the delivery of a healthy baby. Therefore, routine testing with serum TSH is a sufficient and cost-effective screening tool.

Key Words: Hyperthyroidism, Hypothyroidism, Thyroid stimulating hormone (TSH), Triidothyronine (T3), Tetraidothyronine (T4).

Introduction:

Thyroid disorders are common in women of reproductive age; frequently thyroid dysfunction is encountered during pregnancy. Thyroid hormones (Triiodothyronine [T3] & Thyroxin [T4] are very much important to maintain pregnancy and optimal fetal growth. Evaluation of thyroid disease in pregnancy is important for gestational maternal health, obstetric outcome and development of the child. The most frequent thyroid disorder in pregnancy is maternal hypothyroidism. It is associated with fetal loss, placental abruptions, preterm delivery and reduced intellectual function in the offspring [1-8].

The prevalence of hypothyroidism during pregnancy varies from 2.5% from the West to 11% from India. It is more common in Asian countries compared with the West. The prevalence of hypothyroidism is about 2% in iodine sufficient areas while overt and subclinical thyrotoxicosis occur in 0.2 and 2.5% of pregnancies, respectively [9]. Such thyroid disorders are asymptomatic and difficult to distinguish from the features of normal pregnancy on clinical grounds alone.

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Hypothyroidism is believed to be a common issue in India, as it is worldwide. However, there is a paucity of data on the prevalence of hypothyroidism in adult population of India [10]. Thyroid disorders are among the common endocrine problems in pregnant women. It is now well established that not only overt, but subclinical thyroid dysfunction also has adverse effects on maternal and fetal outcome [11]. Before the onset of fetal thyroid function, that occurs about 12 weeks of gestation; the fetus is dependent on the placental transfer of maternal thyroid hormone for normal development. Therefore, maternal hypothyroidism early in the pregnancy causes decreased availability of thyroid hormone during the initial phase of normal brain development and is associated with increased rates of abortion and still birth, impaired neuropsychological development of fetus and congenital malformation and increase in perinatal mortality [12]. Hyperthyroidism is less common than hypothyroidism. It is seen in 0.5- 2/1000 pregnancies and if untreated is associated with obstetric complications such as preeclampsia, premature labor, low birth weight, fetal and perinatal loss. Sub- clinical hypothyroidism is seen in 1.7% of pregnancies and is not associated with adverse outcomes. Thus, prompt identification of thyroid disorder and timely initiation of therapy in pregnancy is essential [13].

To prevent the complications of thyroid disorder a systematic screening should recommended which predominantly identify women with thyroid disorder to reduce the adverse effects on maternal and fetal outcome [11]. So the present study was aimed to identify prevalence of thyroid disorder among primi pregnant women to reduce the further complications.

Materials and methods:

This study was conducted on patients attending the antenatal clinic at obstetrics and Gynecology department at MNR Medical College and Hospital over one and half year period from January 2017 to June2018 after institutional ethical committee approval. This was a hospital based prospective study done on 100 antenatal patients who fulfilled the inclusion criteria. Written informed consent was taken after explaining the nature of study and voluntary participation. Detailed history related to age, gestational age, past and present medical history and surgical history was taken. Family history, personal history, menstrual and obstetric history was taken. Thorough general physical examination was done. Patients were subjected to systemic and obstetric examination. Along with routine

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blood investigations included in antenatal profile complete blood picture, Random blood sugar, Liver function test, Kidney function test, complete urine examination, serum levels of free T3 and freeT4 as well as TSH levels were also determined. Test results were collected and the patients were managed accordingly.

As per the guidelines of American thyroid disorder association for the diagnosis and management of thyroid disease during pregnancy, the Laboratory reference range:

Free T3: 1.7- 4.2 pg/ml

Free T4: 0.7- 1.8 ng/dl

TSH: 0.35- 5.5 mIU/L

Trimester wise cut off values for TSH are:

First trimester: 0.1- 2.5mIU/L
Second trimester: 0.2-3 mIU/L
Third trimester: 0.3- 3mIU/L

Criteria for thyroid dysfunction:

1. Overt hypothyroidism: Low free T3, free T4 with elevated TSH.
2. Subclinical hypothyroidism: Free T3, Free T4 in normal range with TSH more than 2.5 Miu/l
3. Overt hyperthyroidism: Elevated Free T3, Free T4 with decreased TSH.
4. Subclinical hyperthyroidism: Free T3, Free T4 in normal range along with TSH less than 0.1Miu/l [14].

The preferred specimen is serum. Under aseptic conditions 5 ml of whole blood is collected from anterior cubital vein. Serum will be separated following centrifugation.

Inclusion Criteria:

1. Patients attending the antenatal clinic.
2. Primi gravida.
3. Singleton / multiple gestation.

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4. Pregnant women of all 3 trimesters

Exclusion Criteria:

1. Multigravida
2. Diabetes Mellitus
3. Hypertension
4. Renal disease
5. Liver disease
6. Pre- existing thyroid disease
7. Gestational Diabetes Mellitus

Statistical Analysis:

The collected data are analyzed by SPSS software version 16.0 and excel sheet was used for statistical analysis

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Results

Figure 1 shows that, out of 100 sample cases 72 (72%) of cases were diagnosed normal, 14 (14%) of cases were subclinical hypothyroidism and clinical hypothyroidism cases were 10 (10%) and 04 (4%) cases were clinical hyper thyroid cases.

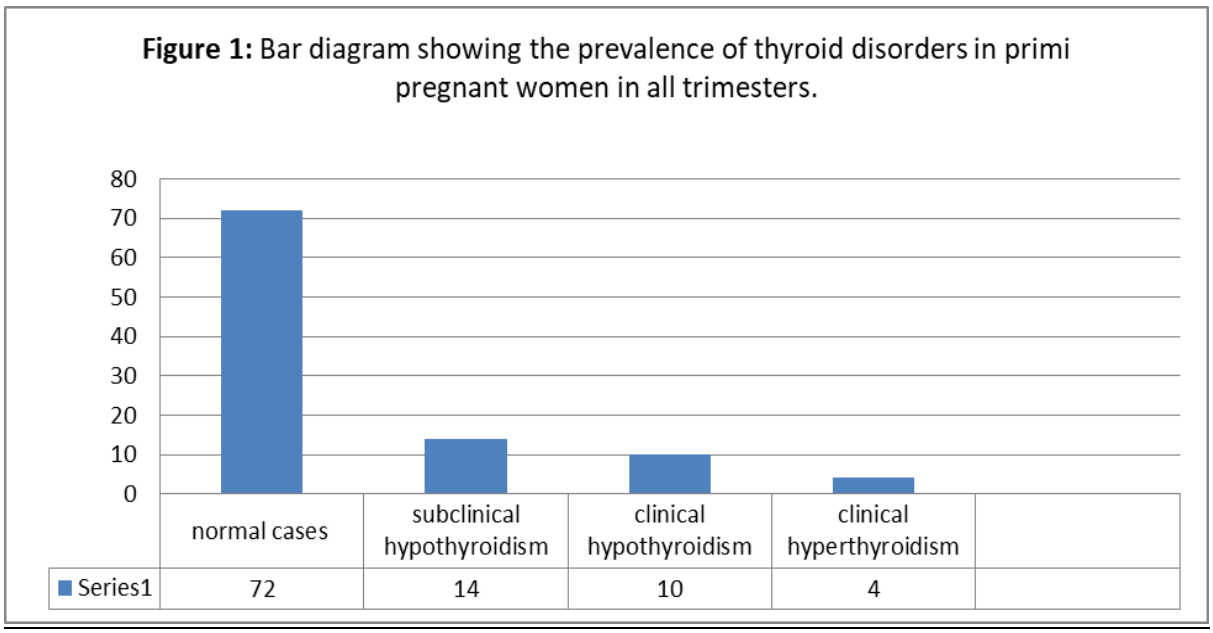

Figure 2 shows the prevalence of thyroid disorders among primi pregnant women.

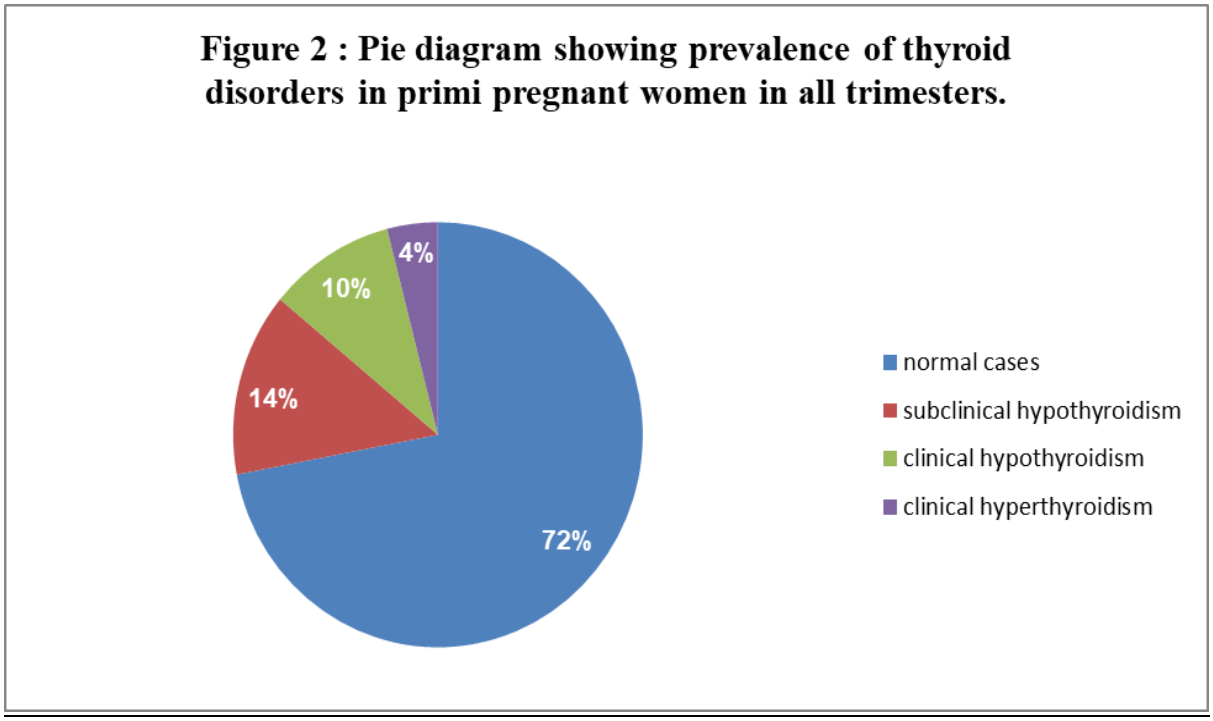

Table 1: Mean and 'p' value of thyroid profile in cases and controls.

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Parameter	Cases (mean)	With Respect to Controls ↑ / ↓	Controls (mean)	'P' value
T3	119.18	↓	133.98	0.0436 *
T4	8.7515	↓	10.252	0.0001 ***
FT3	2.865	↓	3.372	0.0001 ***
FT4	1.4815	↓	1.834	0.0020 **
TSH	2.3174	↑	1.892	0.0389 *

'P' Value < 0.05 –significant. *
'P' Value <0.005 – very significant **
'P' Value <0.0005- very very significant ***

The mean of T3, T4, FT3, FT4, and TSH in controls were in the range of133.98, 10.25, 3.3, 1.8 and 1.89 respectively. It observed that the mean of T3, T4, FT3, FT4, and TSH in cases were in the range of 119.1, 8.7, 2.8, 1.4, and 2.3 respectively. It was evident that TSH levels increased in cases as compared to controls. The mean level of T3,T4, FT3, FT4 was statistically significantly decreased in cases compared to controls (P<0.0001) as shown in Table - 1.

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DISCUSSION

Prevalence of hypothyroidism in pregnancy is 2.5% in western countries to 11% in India. Prevalence is more in Asian countries [14-18]. A total of 100 pregnant women were screened for thyroid disorders in this prospective study. The main aim of the study was to know the prevalence of thyroid disorders in pregnancy [13].

The prevalence of thyroid disorders in our study is 28% , out of which 14% patients were having subclinical hypothyroidism , 10% patients were having clinical hypothyroidism and 4% patients were having clinical hyperthyroidism.

Dhanwal et al. discovered that 14.3% women attending a tertiary public hospital in Delhi, India had hypothyroidism and majority of those women had subclinical hypothyroidism and Bandela et al. from Andhra Pradesh reported 10% prevalence of subclinical hypothyroidism which was comparable to our study [19,20].

Sahu MT et al. studied 633 women in second trimester which showed the prevalence of thyroid disorders as 12.7% and prevalence of SCH is 6.47% and overt hypothyroidism is 4.58% which is comparable to our study [11]. In a study done by Casey BM et al, (2017) the prevalence of SCH was 23% which is very high and not consistent with our study [21]. In a study done by Tuija mannisto et al. the prevalence of subclinical and overt hyperthyroidism was 3.5% and 1.3% which was compared to our study [22].

In a study conducted by Aziz et al. the prevalence of hypothyroidism was 2.5% and in a study by Vargov et al. showed prevalence of SCH 5.9% which was comparable to our study [23].

Our study is not comparable with Thanuja PM et al. where the prevalence of thyroid disorder was 5% and SCH was 0.7% which is very low and not comparable to our study [24].

Vermigilo et al., (1990) from Sicily, mentioned that attention deficit and

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hyperactivity disorder(ADHD) were more common in the children born to mothers with early gestational hypothyroxinemia [25]. Glinoer et al., (1991) screened 120 women for thyroid disorders in pregnancy and its relation with abortion. Women with some form thyroid abnormality and auto – thyroid antibody positive were at increased risk for spontaneous abortion [26].

Studies conducted by Taghavi et al., and Rajput et al., showed prevalence of subclinical hyperthyroidism of about 4.4% and 3.3% which is higher when compared to our study[27]. Prevalence of subclinical hyperthyroidism according to studies conducted by Stagnaro green et al., and Ajmani et al., was 0.5% and 0.75% respectively which was less when compared to our study. Prevalence of overt hyperthyroidism in our study which was 2% was comparable to studies conducted by Taghavi, et al.,(0.6%) , Ajmani, et al., (0.5%) and Stafnaro green, et al.(0.4%) [27-29].

Rao et al., found hypothyroidism in 4.2% of recurrent pregnancy loss which is statistically significant. In another study from Delhi Nagia AS et al., in 2013 reported a prevalence rate of 12% amongst 400 pregnant women. [30]

Study done by Negro R et al., shows that the risk of miscarriage increases by 15% for each 1 mIU/L of TSH elevation. The incidence of hypothyroidism is very much high when compared to studies done in general population like Sharma Partha which showed an incidence of 1.15%. Another study by Cleary- Goldman et al., showed an incidence of <1% with overt hypothyroidism and 2.2% with subclinical hypothyroidism [31,32].

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CONCLUSION

This study showed a high prevalence of thyroid disorder especially hypothyroidism in pregnant women, with the prevalence of subclinical hypothyroidism being 14%, clinical hypothyroidism being 10% and clinical hyperthyroidism being 4%. Although hyperthyroidism in pregnancy is uncommon, effects on both the mother and fetus are critical. 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 India where there is a high prevalence of undiagnosed thyroid disorder. Prompt detection and corrective treatment with thyroxin can prevent many obstetrical complications and result in the delivery of a healthy baby. Therefore, routine testing with serum TSH is a sufficient and cost-effective screening tool.

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