

## Prevalence of Thyroid disorders in pregnancy and its effects on maternal and fetal well being.

Dr.MinuSharan\*, Dr. Mukul Kumar\*\*

\*Associate Professor, Obs. & Gynae., Nalanda Medical College, Patna.

\*\*Assistant Professor, Medicine, Nalanda Medical College, Patna.

**Abstract-** Of all the endocrine disorders, thyroid disorders are common in pregnancy. Several physiological changes occur in maternal thyroid function during pregnancy leading to thyroid dysfunction during pregnancy. Not only overt but subclinical thyroid disorder has adverse effect on mother and foetus.

This study aims to determine the prevalence of thyroid disorders in pregnancy and its adverse maternal and fetal outcome. Pregnant women coming for antenatal checkup in first trimester were subjected to study.

Prevalence of overt hypothyroidism and subclinical hypothyroidism was found to be 2.4 % and 5.1 % respectively. Hyperthyroidism was less than .5% in prevalence. Various maternal and fetal complications occurred such as pre eclampsia, preterm labour, abortion, still birth and IUGR emphasizing the importance of routine antenatal screening.

**Key Word-** hypothyroidism, hyperthyroidism, maternal complications, foetal complications.

Date of Submission: 15-10-2020

Date of Acceptance: 31-10-2020

### I. Introduction:

Thyroid disorders are very common endocrine disorders. Their prevalence is second after diabetes mellitus. Both hypothyroidism and hyperthyroidism can occur. Western literature shows 2.5% prevalence of hypothyroidism and 0.1 to 0.4 % hyperthyroidism in pregnancy.

There is no sufficient data in Indian population. A prevalence of 4.8.% to 11% has been reported.

Pregnancy affects thyroid function in many ways. Two pregnancy related hormones- human chorionic gonadotropin and oestrogen cause increased thyroid hormone levels in the blood. There is transient increase in HCG during first trimester, which stimulates TSH-R. Oestrogen produces increased level of thyroid hormones in the blood and is sustained during pregnancy.

### II. Material and Methods

This study was done at Nalanda Medical college, Hospital, Patna in the department of Obstetrics and Gynaecology from 15 February 2018 to 14 February 2020. Thousand pregnant women attending the antenatal OPD in 1st trimester were selected for prospective study.

#### Inclusion criteria

1. Singleton pregnancy between 6-12 weeks
2. Primigravida/multigravida
3. Known case of hypothyroidism/hyperthyroidism on treatment

#### Exclusion Criteria

1. Multiple Pregnancies
2. Bad Obstetric history
3. Chronic hypertension and diabetes

Thousand pregnant women attending clinic in first trimester were enrolled for study taking into consideration the inclusion and exclusion criteria.

Detailed history was taken, physical examination was done and routine basic investigations were advised.

**Diagnosis of pregnancy** - Diagnosis of pregnancy was made by clinical examination, pregnancy test and ultrasonography.

**Diagnosis of thyroid disorder** – First of all TSH level was estimated in every pregnant woman. If it was abnormal, estimation of FT<sub>3</sub> and FT<sub>4</sub> was advised. The reference range of the test values used in this study were as per the guidelines of American Thyroid Association. The cut off values for TSH was – 1<sup>st</sup> trimester 0.1

– 2.5 miu/L, 2<sup>nd</sup> trimester 0.2- 3 miu/L, 3<sup>rd</sup> trimester 0.3-3 miu/L. Normal free T<sub>4</sub> level was 0.7 to 1.8 ng/ml and free T<sub>3</sub> level was 1.7 to 4.2 pgm/ml. Depending on TSH, FT<sub>3</sub> and FT<sub>4</sub> levels, patients were classified into-  
**Subclinical Hypothyroidism** – Normal FT<sub>3</sub> and FT<sub>4</sub> levels and high TSH level  
**Overt Hypothyroidism** – Low FT<sub>3</sub> and FT<sub>4</sub> levels and high TSH level  
**Subclinical Hyperthyroidism** – Normal FT<sub>3</sub> and FT<sub>4</sub> Levels and low TSH level  
**Overt Hyperthyroidism** – High FT<sub>3</sub> and FT<sub>4</sub> levels and low TSH level

**Treatment-** Both overt and subclinical hypothyroidism were treated with levothyroxine. The replacement dose of levothyroxine in overt hypothyroidism was usually 1.6 microgm/Kg body weight. In subclinical hypothyroidism treatment was started with low dose 25-50 mcg/ day. Further doses of levothyroxine were adjusted by TSH level done every 4 weeks. The goal was to keep TSH level in the lower half of the reference range for the trimester.

Hyperthyroidism was treated with Propylthiouracil in the dose of 50-150 mg t.d.s in the first trimester and carbimazole in the dose of 5-15mg t.d.s in the second and third trimester. To control sympathetic symptoms, Propranolol was used in the dose of 20-40 mg t.d.s.

### III. Results

In the present study 80 out of 1000 pregnant women were suffering from thyroid disorders. The number of subclinical hypothyroidism has the highest, that is 51. Twenty four pregnant women had overt hypothyroidism. Number of pregnant women suffering from subclinical and overt hyperthyroidism was 4 and 1 respectively. Thus subclinical hypothyroidism has the highest and overt hyperthyroidism has the least prevalence.

**Table-1**  
**Prevalence of thyroid disorders**

Type of disorder	Total no of cases	No. of cases	%
Subclinical hypo thyroidism	1000	51	5.1
Overt hypothyroidism	1000	24	2.4
Subclinical hyper thyroidism	1000	4	0.4
Overt hyperthyroidism	1000	1	0.1
Total	1000	80	8

#### Maternal and foetal complications

In the present study out of 51 cases of subclinical hypothyroidism, there were 4 cases of pre-eclampsia, 3 cases each of preterm labour, abortions and anaemia together with 1 case of abruptio placentae. There was increased percentage of complications in overt hypothyroidism. There were 4 cases of pre-eclampsia, 2 cases each of preterm labour, abortion and anaemia and 1 case of abruptio placentae out of 24 cases of overt hypothyroidism.

As regards foetal complications, there were 3 cases of IUGR, 1 case of still birth and 6 NICU admissions among 51 cases of subclinical hypothyroidism. Percentage of complications increased in overt hypothyroidism and among 24 case of overt hypothyroidism there were 4 cases of IUGR, 1 case of still birth and 5 cases of NICU admissions.

**Table-2**  
 Maternal complications among 51 cases of subclinical hypothyroidism .

Complications	No. of cases	%
Pre- eclampsia	4	7.84
Preterm Labour	3	5.88
Abortion	3	1.96
Abruptio placentae	1	1.96
Anaemia	3	5.88

**Table-3**  
 Maternal complications among 24 cases of overt hypothyroidism

Maternal complications	No. of cases	%
Pre eclampsia	4	16.66
Preterm labour	2	8.33
Abortion	2	4.16
Abruptio placentae	1	4.16
Anaemia	2	8.33

**Table-4**  
Foetal complications among 51 cases of subclinical hypothyroidism .

Complications	No. of cases	%
IUGR	3	5.88
Still birth	1	1.96
NICU admission	6	11.76

**Table-5**  
Foetal complications among 24 cases of overt hypothyroidism .

Complication	No . of cases	%
IUGR	4	16.66
Still birth	1	4.16
NICU admission	5	20.8

Out of 4 cases of subclinical hyperthyroidism 1 had pre-eclampsia leading to IUGR and NICU admission. There was only 1 case of overt hyperthyroidism with complication of pre-eclampsia leading to abruption placenta and NICU admission.

#### IV. Discussion

The prevalence of thyroid disorders in pregnancy varies in different parts of the world. In western countries 0.3-0.5 % pregnancies are complicated by overt hypothyroidism and 2.5% subclinical hypothyroidism. In our country prevalence of thyroid disorders is higher compared to western countries.

In the present study the prevalence of overt hypothyroidism is 2.4% and that of subclinical hypothyroidism is 5.1%.

The prevalence of 2.4 % overt hypothyroidism in the present study is comparable to the studies conducted by Ajmani, et al 3.0%, P.V. Bandela, et al 2.8.7 % and Toghiani, et al 2.41%.

4.5 % prevalence of subclinical hypothyroidism in the studies conducted by Sahu, et al and K.P Singh, et al is comparable to present study of 5.1 % prevalence .

Iodine deficiency is the most common cause of increased prevalence of hypothyroidism in pregnancy.

Presence of goitrogens in diet, micronutrient deficiency such as selenium and iron deficiency also contribute to the causation of hypothyroidism and goitre in developing countries like India. In iodine sufficient areas Hashimoto thyroiditis is the cause .

In the present study, prevalence of subclinical hyperthyroidism is 0.4 % .It is comparable to the studies conducted by Stagnorogreen, et al 0.5 % and Ajmani, at al 0.75% .

Prevalence of overt hyperthyroidism in the present is 0.1% which is less compared to studies conducted by Taghavi et al 0.6% and Ajmani, et al 0.5% .

In the present study the maternal complications in subclinical hypothyroidism are pre-eclampsia (7.8% ), preterm labour (5.88%), a (5.88% ), abruption placenta ( 1.96%) and anaemia ( 5.88%) ,

The foetal complications are IUGR (5.88% ), still birth (1.96% ) and NICU admission ( 11.76%). In earlier studies conducted by Leung, et al , Sahu MT, et al and Ajmani,et al, no. of complications are more. Where as in the study of Taghavi et al , complications are less in number.

Maternal and foetal complications in overt hypothyroidism are more as compared to the subclinical hypothyroidism they are pre-eclampsia (16.66%), preterm labour (8.33% ), abortion ( 8.33 % ), abruption placenta (4.16%) and anaemia ( 8.33%) , IUGR ( 16.66%), still birth (4.16%) and NICU admissions (20.8%).

But they are less as compared to the earlier studies conducted by Leung, et al , Sahu MT, et al , Ablovich, et al and Ajmani, et al.

The maternal and foetal complications of hyperthyroidism in the present study are less in the present study as compared to earlier studies conducted by Miller, et al and Kriplani, et al.

#### V. Conclusion

Prevalence of thyroid disorders in pregnancy is more in our country as compared to the western world. As they lead to various adverse effects in mother and foetus, every pregnant woman coming for antenatal check-up should be screened for thyroid disorders. Hence forth they should be adequately treated.

#### References

- [1]. Ajmani Sangita Nangia et al. Prevalence of Overt and subclinical thyroid dysfunction among pregnant woman and its effect on maternal and fetal outcome. The journal of Obstetrics & Gynaecology of India 2014; 64 (2) : 105 – 110
- [2]. P.V Bandela, et al. Antenatal thyroid dysfunction in Rayalaseema region: A preliminary cross section study based on circulating serum thyrotrophin levels. International journal of Applied Biology and Pharmaceutical Technology, 2013; 4(4) : 135- 139
- [3]. Taghavi M, Saghafi N, Shirin S. Outcome of Thyroid dysfunction in pregnancy in Mashhad, Iran. Int. J. Endocrinal Metab, 2009; 2: 82- 85

Prevalence of Thyroid disorders in pregnancy and its effects on maternal and fetal well being.

- [4]. Sahu MT, Das V, Mittal S, Agrawal A, Sahu M. Overt and subclinical thyroid distinction among Indian pregnant women and its effect on maternal and fetal outcome.
- [5]. Archives of Gynaecology and Obstetrics, 2010; 281 (2) :215 – 220
- [6]. K.P. Singh, et al. Prevalence of hypothyroidism among pregnant women in the sub mountain state of Manipur.
- [7]. International Journal of Scientific Study, 2015; 3 (5) : 143 – 146
- [8]. Stagnaro – Green A ,Abalovich M, Alexander E, Azizi F, Mestman J, Negro R, et al. Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and post partum. Thyroid, 2011; 21 (10) : 1081 – 125
- [9]. Leung AS, Millar LK , Kooning PP, Montorom, Mestman J. Perinatal outcome in hypothyroid pregnancies. Obstetric gynecology, 1993; 81 (3) :349-353
- [10]. Abalovich M, Amino N, Barbour LA, Cobin RH, De Groot LJ, Glinoe D. Management of thyroid dysfunction during pregnancy and postpartum: an endocrine society clinical practice guideline. J Clin Endocrinol Metab, 2010; 95(4) : 1699-1707
- [11]. Millar LK, Wing DA. Low birth weight and pre-clampoa in pregnancies complicated by hypothyroidism. Obstetric Gynecal , 1994; 84 (6) : 946-9
- [12]. Kriplani A, Buckshee K, et al. Maternal and perinatal outcome in thyrotoxicosis complicating pregnancy. Eur J Obstet Gynecol Reprod Biol, 199;54(3) 159 -63

Dr.MinuSharan, et. al. “Prevalence of Thyroid disorders in pregnancy and its effects on maternal and fetal well being.” *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(10), 2020, pp. 01-04.