

Frequency of Thyroid Disorder in Pregnant Females in Tertiary Care Hospitals

AMNA JAVED¹, MUHAMMAD BILAL NASIR², MADIHA RASHEED³

¹Senior Registrar, Obst. & Gynaecology Unit-III, Post Graduate Medical Institute/LGH, Lahore.

²Assistant Professor, Division of Gastroenterology & Hepatology, Post Graduate Medical Institute/LGH, Lahore.

³PGR, Obst. & Gynaecology Unit-III, Post Graduate Medical Institute/LGH, Lahore.

Correspondence to Dr. Amna Javed, Email: mbnasir80@gmail.com, Ph. No. 0333-4756307

ABSTRACT

Background: Thyroid dysfunction during pregnancy has been an important area of research due to its imminent in maternal and fetal outcome. Literature showed a wide range of hypothyroidism during pregnancy in Asian population.

Aim: To find the rate of thyroid disorder during pregnancy among the females presenting for antenatal check-up in a tertiary-care hospital.

Methods: This Cross sectional study was done at Department of Gynaecology Lahore General Hospital, Lahore for 6 months. Sample size of 360 patients included and assessed for thyroid hormone levels. Blood sample of pregnant female was sent to laboratory of the hospital to note the level of TSH, free T3 & free T4 in blood. Reports were assessed and if levels were deranged, then thyroid dysfunction was noted.

Results: The mean age of pregnant females was 26.63±7.41 years and the gestational mean age of females was 19.64±6.88 weeks. Prevalence of thyroid disorder in this study was 159 (44.2%) out of 360 pregnant females. Among thyroid dysfunction cases, 159 (44.2%) pregnant females had thyroid dysfunction and 201 (55.8%) had euthyroid. Out of 159 positive females, subclinical hypothyroidism was observed in 107 (67.3%) while subclinical hyperthyroidism in 52 (32.7%) with poor obstetrical history.

Conclusions: This study concludes that hypothyroidism is high in pregnancy (67.5%). Most of these females had subclinical hypothyroidism.

Key words: Hypothyroidism, thyroid disorder, pregnancy

INTRODUCTION

Thyroid dysfunction during pregnancy has been an important area of research due to its imminent in maternal and fetal outcome. It has been documented that maternal thyroid hormone excess or lacking can affect the outcome for mother and foetus as well as interfere with ovulation and fertility.¹ According to Western literature, the rate of hypothyroidism during pregnancy is around 2.5%. In India, there are few studies regarding rates of hypothyroidism during pregnancy which ranged from 4.8% to 11%^{2,3}.

Thyroid dysfunction during pregnancy is associated with adverse maternal complications such as anemia complicating pregnancy, miscarriages, pre-eclampsia, abrupt-placenta, postpartum haemorrhage and fetal complications like premature birth, increased neo-natal respiratory distress. Maternal or fetal hypothyroidism may also contribute to irreversible brain damage with mental retardation and neurological defects that support testing for thyroid dysfunction during early pregnancy with thyroid hypofunction interventional levothyroxine therapy⁴⁻⁹.

Thyroid dysfunction is one of the commonly encountered disorder during pregnancy. Adverse obstetrical outcomes due to abnormal functioning of thyroid can be intra-uterine growth retardation, hypertensive disorders of pregnancy, preterm deliveries, recurrent miscarriages, and reduced cognitive & neurological growth of fetus.¹⁰⁻¹² Overt hypothyroidism is reported in 0.2% females and subclinical hypothyroidism in 2.3% females.¹³ Mild or sub-clinical hyperthyroidism during pregnancy can be detected in 1.7% cases and is not reported to be associated with any sort of significant adverse obstetrical outcome.

The objective of the study was to find the rate of thyroid disorder in pregnant females presenting for antenatal check-up in tertiary care hospital.

MATERIAL AND METHODS

It was a cross-sectional study conducted in the Department of Obstetrics & Gynaecology Lahore General Hospital, Lahore during a period of six months from March 2019 to August 2019. Sample size was 60 patients, calculated keeping confidence level =95%, margin of error =3% and percentage of hypothyroidism in pregnancy as 4.8%. Simple random sampling technique was used.

Inclusion Criteria: Pregnant females aged 18-40 years having bad obstetrical history i.e., ≥3 consecutive miscarriages, stillbirth/neonatal death in previous pregnancies or congenital anomalies were included.

Exclusion Criteria: Patients with previous history of thyroid surgery, taking anti-psychotic drugs, thyroxin, β-blockers, neomercazol or having multiple fetus were not included.

Data Collection Procedure: Three hundred and sixty females attending antenatal clinic were included after fulfilling the inclusion criteria. Informed consent was obtained. Demographic details of patients (name, age, gestational age, BMI) were obtained. Then sample of blood was taken in 5cc disposable syringe. All the samples were sent to laboratory of the hospital and TSH, free T3 & free T4 levels were assessed by using radioimmunoassay kit (Beckman Coulter). The reports were obtained from laboratory and evaluated. If levels of thyroid function test deranged, then thyroid dysfunction was noted. Subtype of thyroid dysfunction were based on concentration of TSH,

free T3 & free T4 as per American Thyroid Associations Guidelines. Subclinical hypothyroidism was labeled if TSH ranged in 2.5-10.0mIU/L with normal free T4 i.e., 0.7-1.8ng/dL and subclinical hyperthyroidism was labeled if TSH was <0.1 mIU/L with normal free T4 i.e. 0.7-1.8ng/dL.

Analysis plan: SPSS version 21.0 was used to enter and analyzed the data. Thyroid dysfunction and its subtypes was calculated as frequency and percentage.

RESULTS

In this study, we included 200 females; who were enrolled, to examine the thyroid dysfunction, the mean age of all females was 26.63±7.41 years and the gestational mean age of females was 19.64±6.88 weeks. Prevalence of hypothyroidism was 159(44.2%) out of 360 pregnant females (Table 1).

The mean FT3 concentration was 2.82±1.31ng/dl while mean FT4 concentration was 1.98±1.12ng/dl. The mean TSH concentration of was 3.38±1.39mIU/L. Out of 360 females 220(61.1%) were never received prenatal care while 76% were illiterate. Among all, 35% were taking iodized salt while thyroid enlargement was noted in 47% cases. About 60% females were anemic and came from poor socioeconomic class. Table 2

Among thyroid dysfunction cases, 160 (44.2%) pregnant females had thyroid dysfunction and 202(55.8%) had euthyroid. Out of 160 positive females, 108(67.5%) had subclinical hypothyroidism while 52(32.5%) had subclinical hyperthyroidism. Table 3

Table 1: Demographic characteristics of patients

	Thyroid Dysfunction	
	Yes	No
n	159 (44.2%)	201 (55.8%)
Age (years)	25.63±7.01	27.45±7.71
Gestational age	19.36±6.46	20.21±7.20

Table 2: TSH, ft3, ft4 in females was poor obstetric history

Ft3 (ng/dL)	Ft4 (ng/dL)	TSH (mIU/L)
	1.98±1.12	3.38±1.39

Table 3: Frequency of subclinical thyroid dysfunction among pregnant females

Thyroid dysfunction	n	%age
Subclinical hypothyroidism	108	67.5
Subclinical hyperthyroidism	52	32.5
Total	160	100

DISCUSSION

The purpose of this study was to assess the function of thyroid during pregnancy. The key results was that the majority of 88 females attending tertiary hospitals are subclinical hypothyroidism. There is also evidence of thyroid autoimmunity for a significant number of these females. Thyroid dysfunction is 2nd most common endocrine disorder i.e. in 2-3% pregnant females¹⁴¹ In our study the frequency of thyroid dysfunction during pregnancy was 159 (44.2%), out of 159 hypothyroidism was 107(67.3%) and hyperthyroidism was 52(32.7%). As compare to Oshashi et al., who reported the prevalence of thyroid dysfunction in 24.7% pregnant females i.e. 16.8% hypothyroidism while 7.9% hyperthyroidism¹⁵. Several countries have

recently reported the prevalence of hypothyroidism. On analysis, results of this study are consistent with recently published data from India and other countries. Previous studies conducted in Delhi reported a 14.3% prevalence of hypothyroidism during the first trimester¹⁵.

In our study, among pregnant females with poor obstetrical history, the thyroid dysfunction was diagnosed in 160(44.2%) cases. Subclinical Hypothyroidism was observed in 108(67.5%) females and 52(32.5%) had subclinical hypothyroidism. High percentage of females also suffer from thyroid dysfunction in our study as we only research high risk group with previously untreated poor obstetric history. In our study, the occurrence of subclinical hyperthyroidism was 32.5%. In another study, conducted by Sahu et al., the rate of subclinical hyperthyroidism was 0.9% in pregnant females. Thus, we found very high rate of subclinical hyperthyroidism in pregnant females which increases the hazard of complications during or after pregnancy².

Pillai et al., reported the rate of thyroid dysfunction in 10.8% cases, of which hypothyroidism constituted 9.2%, with sub-clinical hypothyroidism constituting 8.5% and overt hypothyroidism accounting for 0.7% and subclinical hyperthyroidism was 1.6%.¹⁷ Prevalence of hypothyroidism in pregnancy vary in differ greatly in geographical regions. Data of Western region countries shows that hypothyroidism can complicates around 0.3-0.5% pregnancies while subclinical hypothyroidism in 2.5% cases.

Similarly, in a community-based large-scale study involving over 500,000 pregnant women from the USA showed a 15.5% prevalence of hypothyroidism.⁴ In a study done on Caucasian women by Knight et al.,⁶ the prevalence was found to be 13.9%. Prevalence of subclinical hypothyroidism in the United States ranged from 2% to 2.5%. On the other hand, the prevalence of subclinical hypothyroidism in Belgium has been reported to be 6.8%, and as high as 13.7% in Spain. A cross-sectional, multicenter study undertaken in India showed that 13.1% of pregnant women had hypothyroidism. The majority of these cases were subclinical and in the first trimester of pregnancy⁷.

The frequency of thyroid dysfunction during pregnancy differs in different ethnicity as reported in several studies. In our study, the frequency of this disorder during pregnancy was 160 (44.2%), which is much higher than reported by Wang et al.,¹⁸ i.e. 10.2%, while 14.6% reported by Taghavi et al.^{19,20} 13.25% reported by Ajmaniet al²¹. and 26.5% by Rajput et al²². While the study of Thanuja et al.,²⁰ reported the prevalence of thyroid dysfunction in about 5% females only.

CONCLUSION

This study concludes that hypothyroidism is high in pregnancy (67.5%). Most of these pregnant women with thyroid dysfunction have subclinical hypothyroidism. In order to determine whether universal screening is needed for pregnant women's, further studies are required to assess the impact of thyroid disorder during pregnancy in the Pakistan population.

REFERENCES

1. Casey BM, Leveno KJ. Thyroid disease in pregnancy. *Obstetrics & Gynecology* 2006;108(5):1283-92.
2. Sahu MT, Das V, Mittal S, Agarwal A, Sahu M. Overt and subclinical thyroid dysfunction among Indian pregnant women and its effect on maternal and fetal outcome. *Archives of gynecology and obstetrics* 2010;281(2):215.
3. Nambiar V, Jagtap VS, Sarathi V, Lila AR, Kamalanathan S, Bandgar TR, et al. Prevalence and impact of thyroid disorders on maternal outcome in Asian-Indian pregnant women. *Journal of thyroid research* 2011;2011.
4. Blatt AJ, Nakamoto JM, Kaufman HW. National status of testing for hypothyroidism during pregnancy and postpartum. *The Journal of Clinical Endocrinology & Metabolism* 2012;97(3):777-84.
5. Reh A, Grifo J, Danoff A. What is a normal thyroid-stimulating hormone (TSH) level? Effects of stricter TSH thresholds on pregnancy outcomes after in vitro fertilization. *Fertility and sterility* 2010;94(7):2920-2.
6. Knight BA, Shields BM, Hattersley AT, Vaidya B. Maternal hypothyroxinaemia in pregnancy is associated with obesity and adverse maternal metabolic parameters. *European journal of endocrinology* 2016;174(1):51.
7. Maraka S, Ospina NMS, O'Keeffe DT, Espinosa De Ycaza AE, Gionfriddo MR, Erwin PJ, et al. Subclinical hypothyroidism in pregnancy: a systematic review and meta-analysis. *Thyroid* 2016;26(4):580-90.
8. Klubo-Gwiezdzinska J, Burman KD, Van Nostrand D, Wartofsky L. Levothyroxine treatment in pregnancy: indications, efficacy, and therapeutic regimen. *Journal of thyroid research* 2011;2011.
9. Dhanwal DK, Bajaj S, Rajput R, Subramaniam K, Chowdhury S, Bhandari R, et al. Prevalence of hypothyroidism in pregnancy: An epidemiological study from 11 cities in 9 states of India. *Indian journal of endocrinology and metabolism* 2016;20(3):387.
10. Xing J, Yuan E, Li J, Zhang Y, Meng X, Zhang X, et al. Trimester-and assay-specific thyroid reference intervals for pregnant women in China. *International journal of endocrinology* 2016;2016.
11. Negro R, Stagnaro-Green A. Diagnosis and management of subclinical hypothyroidism in pregnancy. *Bmj* 2014;349:g4929.
12. Moon H-W, Chung H-J, Park C-M, Hur M, Yun Y-M. Establishment of trimester-specific reference intervals for thyroid hormones in Korean pregnant women. *Annals of laboratory medicine* 2015;35(2):198-204.
13. Sekhri T, Juhi JA, Wilfred R, Kanwar RS, Sethi J, Bhadra K, et al. Trimester specific reference intervals for thyroid function tests in normal Indian pregnant women. *Indian journal of endocrinology and metabolism* 2016;20(1):101.
14. Shah JM, Mehta MN, Viradia HB. Screening for thyroid dysfunction during pregnancy. *Thyroid Research and Practice* 2013;10(2):65.
15. Ohashi M, Furukawa S, Michikata K, Kai K, Sameshima H, Ikenoue T. Risk-based screening for thyroid dysfunction during pregnancy. *Journal of pregnancy* 2013;2013.
16. Dhanwal DK, Prasad S, Agarwal A, Dixit V, Banerjee A. High prevalence of subclinical hypothyroidism during first trimester of pregnancy in North India. *Indian journal of endocrinology and metabolism* 2013;17(2):281.
17. Pillai NS, Bennett J. Prevalence of hypothyroidism amongst pregnant women: a study done in rural set up. *Thyroid*;11(3):4.
18. Wang W, Teng W, Shan Z, Wang S, Li J, Zhu L, et al. The prevalence of thyroid disorders during early pregnancy in China: the benefits of universal screening in the first trimester of pregnancy. *European Journal of Endocrinology* 2011;164(2):263-8.
19. Taghavi M, Saghafi N, Shirin S. Outcome of thyroid dysfunction in pregnancy in Mashhad, Iran. 2009.
20. Thanuja P, Rajgopal K, Sadiqunnisa. Thyroid dysfunction in pregnancy and its maternal outcome. *IOSR Journal of Dental and Medical Sciences* 2014;13(1):11-5.
21. Ajmani SN, Aggarwal D, Bhatia P, Sharma M, Sarabhai V, Paul M. Prevalence of overt and subclinical thyroid dysfunction among pregnant women and its effect on maternal and fetal outcome. *The Journal of Obstetrics and Gynecology of India* 2014;64(2):105-10.
22. Rajput R, Goel V, Nanda S, Rajput M, Seth S. Prevalence of thyroid dysfunction among women during the first trimester of pregnancy at a tertiary care hospital in Haryana. *Indian journal of endocrinology and metabolism* 2015;19(3):416.