

Prevalence of Hypothyroidism in Pregnant Females of Block Hazratbal, Kashmir

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ABSTRACT

Introduction: Among various endocrine problems, thyroid disorders are the most common world-wide. An estimated 200 million individuals suffer from thyroid disorders throughout the world. Undetected and untreated thyroid disorders especially hypothyroidism affects both maternal and fetal outcomes. Data regarding prevalence of hypothyroidism in pregnant females in Kashmir is limited. Therefore this study was done to evaluate the prevalence of hypothyroidism in pregnant females of Block Hazratbal, field practice area of Government Medical College, Srinagar.

Material and Methods: All the pregnant females registered at the sub-centres and Primary Health Centres irrespective of the gestational age who gave their consent were enrolled. Morning samples of serum were analyzed for T₃, T₄ and TSH. Trimester specific reference levels of TSH as recommended by the American Thyroid Association were used for classifying the females.

Results: A total of 342 women were included in the study. The prevalence of hypothyroidism was found to be 34.22% (117), out of which 33.64% (114) were having sub-clinical hypothyroidism and 0.58% (3) were having overt hypothyroidism.

Conclusion: Prevalence of hypothyroidism was found to be high especially the sub-clinical type of hypothyroidism.

Keywords: Hypothyroidism, Block hazratbal, Kashmir.

INTRODUCTION

Evaluation of thyroid disease in pregnancy is important for gestational maternal health, obstetric outcome and subsequent development of the child.¹ Pregnancy is normally associated with significant changes in thyroid gland. The size of the thyroid gland increases by about 10% in iodine replete countries and to a greater extent in countries with iodine deficiency.² There is an increase in the production of thyroid hormones during pregnancy to the extent of about 50% which includes both thyroxine (T₄) and tri-iodothyronine (T₃) with an increase in the daily iodine requirement of about 50%. Pregnancy is a stress test for the thyroid resulting in hypothyroidism in women with limited thyroidal reserve or iodine deficiency.³ The most frequent thyroid disorder in pregnancy is maternal hypothyroidism.¹ Early symptoms include constipation, cold intolerance, fatigue, heavy and irregular periods, dry skin, depression, weight gain. Late symptoms are hoarseness, puffy face hands and feet, slow speech, decreased taste and smell, thickening of the skin, thinning of eyebrows, swelling of arms and legs, pericardial effusion etc. Hypothyroidism during pregnancy is deleterious to both mother and child. It is associated with fetal loss, placental abruption, preeclampsia, preterm delivery and reduced intellectual function in the offspring.¹ The prevalence of hypothyroidism in pregnant females is variable. According to one study in Europe prevalence of hypothyroidism in pregnant females is about 7.2%.⁴ In India prevalence of hypothyroidism

in pregnant females is 4.8%.⁵ Prevalence of hypothyroidism in pregnancy in northern India according to one study is 14.3%.¹ Data regarding the prevalence of hypothyroidism in pregnant females in Jammu and Kashmir is limited so the present study was done to find out the prevalence of hypothyroidism in these females.

MATERIAL AND METHODS

This study was conducted in Block Hazratbal of District Srinagar, which is the field practice area of Government Medical College, Srinagar, Jammu and Kashmir. This study was conducted in Department of Community Medicine in collaboration with Department of Biochemistry after clearance from Institutional Ethics Committee. The study period was from 1st April 2014 to 31st March 2015. All the pregnant females registered at the sub-centres and Primary Health Centres irrespective of the gestational age were approached and their consent for participation in the study was sought. All the females who gave their consent for participation in the study were enrolled. A sample of 342 females was taken. The information was collected from the study subjects on basis of pretested semi-structured questionnaire. The information was collected regarding age, literacy, residence, income, parity, family history of hypothyroidism etc. Morning sample of about 3 ml of venous blood was taken under all aseptic precautions. The blood was allowed to stand undisturbed at room temperature for about 2 hours. The samples were centrifuged at 2000-3000 revolutions / minute resulting in quick separation of serum. Estimation of total T₃, T₄ and TSH was carried out using Architect I 1000 SR auto analyzer. Trimester specific reference ranges as recommended by the American Thyroid Association were used for screening the females. Trimester specific reference ranges used for TSH were: 1st trimester-0.1 to 2.5 mIU/L, 2nd trimester -0.2 to 3.0 mIU/L, 3rd trimester-0.3 to 3.0 mIU/L.

STATISTICAL ANALYSIS

The data was analyzed using Epi info version 16. Chi-square and t-test were applied for comparison.

RESULTS

A total of 342 females were enrolled. The prevalence of hypothyroidism in present study was estimated to be 34.22%, 33.35% had subclinical and 0.87% had overt hypothyroidism as

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shown in Table-2. Majority (74.23%) of females were in the age group of 26 to 30 years, living in joint families (71.93%). About 56.14% of the females belonged to the socioeconomic class IV (as per the B.G. Prasad's scale modified for the year 2014). 45.91% of females were illiterate and were predominantly homemakers (94.15%). About 37.73% of females were

primigravida and were in second trimester of their pregnancy (37.43%) as shown in table-1. History of abortions was present in 19.60% of females, 11.40% females gave history of menstrual irregularity. Family history of hypothyroidism was present in 19.59% of females (table-1). 2.63% of females gave history of associated chronic disease.

The prevalence of hypothyroidism in present study was estimated to be 34.22%, 0.58% of the females had overt and 33.35% had subclinical hypothyroidism (Table-2).

Hypothyroidism was found to be significantly associated with history of abortions and family history of hypothyroidism (table-3).

DISCUSSION

Pregnancy has a profound impact on thyroid gland, so thyroid disorders are frequently observed during pregnancy.⁶ Thyroid disorders are the second most common endocrinopathies found in pregnancy. Hypothyroidism is more common in women in their reproductive age. Data from western countries indicates that overt hypothyroidism complicates up to 0.3-0.5% pregnancies subclinical hypothyroidism prevalence is estimated to be 2.5%.⁹ The prevalence of hypothyroidism in present study was estimated to be 34.22%, 0.87% of the females had overt and 33.35% had subclinical hypothyroidism. The finding is in concordance with the study conducted by Felix K et al (2015) in Manipur where they compared the trimester specific range as published by American Thyroid Association (ATA) guidelines with the normal population/laboratory reference range, the prevalence of subclinical hypothyroidism as per American Thyroid Association guidelines were 34.4,31.5 and 30.5%,in the first, second and trimester respectively. The prevalence in our study is higher as compared to studies carried out in southern part of our country. A study conducted by Sapna C. Shah et al (2014) in Karnataka shows a prevalence of 9%.⁹ This difference can be explained by the fact that our state falls in the endemic goiter belt of India. Even though India is considered to be iodine sufficient, pregnancy has a profound impact on the thyroid gland and thyroid function. The gland increases 10% in size during pregnancy in iodine-replete countries and by 10-20% in areas of iodine deficiency.² Production of thyroxin (T₄) and tri-iodothyronine (T₃) increases by 50%, along with a 50% increase in daily iodine requirement. These physiological changes may result in hypothyroidism during pregnancy in iodine-deficient women.³ A study conducted by Chauhan Rooplekha et al. (2015) in Jabalpur reported a prevalence

Educational status	n	%
Illiterate	157	45.93
Primary	15	4.38
Middle	41	11.98
High	69	20.17
Higher Secondary	31	9.06
Graduate	19	5.56
Postgraduate	10	2.92
Total	342	100
Occupation		
Home makers	322	94.15
Teachers	3	0.88
Skilled workers	13	3.80
Others	4	1.17
Total	342	100
Socio-economic status		
Class I	4	1.17
Class II	23	6.73
Class III	123	35.96
Class IV	192	56.14
Total	342	100
Trimester of pregnancy		
First	112	32.74
Second	128	37.43
Third	102	29.83
Total		
Family history of hypothyroidism		
Yes	67	19.59
No	275	80.41
Total	342	100

Table-1: Demographic characteristics of pregnant women.

Thyroid status	n	%
Overt hypothyroidism	3	0.58
Subclinical hypothyroidism	114	33.64
Euthyroid	225	65.78
Total	342	100

Table-2: Distribution of the females according to the clinical type of hypothyroidism.

Variable		Hypothyroidism		P
		Yes n(%)	No n(%)	
History of abortion	Yes	33(28.20)	84(71.80)	0.01
	No	84(71.80)	191(84.88)	
Family history of hypothyroidism	Yes	30(25.64)	37(16.44)	0.02
	No	87(74.36)	188(83.56)	
History of bleeding PV	Yes	17(14.53)	21(9.33)	0.07
	No	100(85.47)	204(90.67)	
History of LBW	Yes	4(4.94)	6(4.55)	0.44
	No	77(95.06)	126(95.45)	
History of PPH	Yes	2(2.47)	4(3.03)	0.42
	No	79(97.53)	128(96.97)	

Table-3: Relationship of hypothyroidism with various characteristics of pregnant females.

of 23.6% out of which 21.6% were subclinical and 2% were overtly hypothyroidism.¹⁰ A study by Nataraj H.G et al.(2015),in Bangalore reported prevalence of subclinical hypothyroidism as 13%,which is less than the prevalence in the present study.¹⁰ The reason for low prevalence could be that he has studied the prevalence in first trimester only. Most of the females are unaware of pregnancy in the first trimester. Nabhi VR. Murty et al. (2015), conducted a study in Telangana (South India) and reported prevalence of 19.41%, 16.11% for subclinical and 3.30 for overt hypothyroidism.⁶ The difference from present study is the cut-off for labeling the subjects as hypothyroid, which was TSH values of more than 3.0 mIU/L whereas in the present study we used trimester specific cut-offs as recommended by the American Thyroid Association(ATA).Dinesh K. Dhanwal et al. (2013) conducted a study to evaluate the prevalence of thyroid dysfunction during first trimester in North India. They reported the prevalence of 14.3% which was lower than the present study, the reason being the upper limit of TSH which was 4.5 μ IU/L.¹¹ A study conducted by Weiwei Wang et al.(2011), in China reported the prevalence of 10.9% among the high risk groups. The reason for low prevalence could be the cutoff values for TSH, which was taken as 3.93 μ IU/L.¹²

In our study 19.59% of the females gave history of abortions whereas 80.41% of females gave no such history. The abortion rate was 28.20% among the hypothyroid females whereas it was 15.12% among the euthyroid females. The association between history of abortions and hypothyroidism was statistically significant ($p=0.01$). In a study by Anupama Dave et al (2014), out of 2.2% spontaneous abortions 28.5% were in euthyroid group while 71.4% were in hypothyroid group, the association was statistically significant ($p=0.001$).¹³ Family history of thyroid disorder was present in 19.59% of study participants. Among the hypothyroid females 25.64% gave family history of hypothyroidism whereas only 16.44% among euthyroid participants gave family history of hypothyroidism. The association between family history of hypothyroidism and hypothyroidism was statistically significant. A study by Roberto Negro et al reported family history in 12.8% of study participants, which is in concordance with the present study.¹⁴

CONCLUSION

Our study area has a high prevalence of hypothyroidism in pregnant females. About 30% cases of subclinical hypothyroidism are likely to be missed if only high risk females are screened for hypothyroidism. Considering the adverse effects of maternal hypothyroidism on maternal and fetal outcomes universal screening of pregnant females in our part of the world is recommended.

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