

## THE PREVALENCE OF HYPOTHYROIDISM IN LOW INCOME, URBAN PREGNANT WOMEN

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### ABSTRACT

The present study was aimed to study the prevalence of hypothyroidism in low income, urban pregnant women. This is a retrospective study which includes 1062 pregnant women attending the antenatal clinic at ESI hospital, Sanathnagar, Hyderabad. Thyroid profile is being done as a routine test along with other antenatal profile tests in our hospital. Thyroid profile test includes serum T3, serum T4 and serum TSH. Hospital Ethics committee permission was granted for the study. A total of 1062 pregnant women were enrolled for this study. Results showed 20.1% prevalence of hypothyroidism of which 14.9% being subclinical hypothyroidism and 6.6% overt hypothyroidism. The study shows a very high prevalence rate of hypothyroidism in the patients attending the antenatal outpatient department at ESI hospital, Sanathnagar, Hyderabad. This justifies the inclusion of thyroid profile test as a routine test in the antenatal profile.

### INTRODUCTION

Hypothyroidism is a condition which affects both maternal and fetal outcome. Children born to untreated or undertreated mothers have profound effect on future intellectual development [1]. Pregnancy is associated with reversible changes in the maternal thyroid physiology. There is moderate enlargement of thyroid gland. There is increase in the levels of thyroid binding globulin which is estrogen mediated. The thyroid stimulation is due to the "spill effect" by HCG, which shares structural similarity with TSH. There is a relative decline in the availability of iodine due to increased renal clearance and losses to fetus and placenta [2]. The fetal thyroid gland begins synthesizing thyroid hormone after 12 weeks of gestation. Thyroid hormone is supplied to the fetus by the mother before this time, and it is at this time that thyroid hormones

are most important for fetal brain development. However significant fetal brain development continues beyond first trimester, making thyroid hormone also important in later gestation [2]. It has been suggested that the babies of women with hypothyroidism in pregnancy are at increased risk of impaired neurological development [2].

Various studies have showed that in women with normal thyrotropin (TSH) and free thyroxin (fT4), elevated titers of TPOAbs (Thyroid peroxidase antibodies) are associated with complications like preterm birth, abnormal fetal growth, and prenatal/postnatal depression symptoms [3].

Maternal thyroid dysfunction in early pregnancy leads to impaired cognition and attention deficit / hyperactivity problems in preschool children [3]. Women with overt hypothyroidism are at an increased risk for pregnancy complications such as early pregnancy failure, preeclampsia, placental abruption, low birth weight and still birth [4-6]. Treatment of women with overt hypothyroidism has been associated with improved pregnancy outcomes.

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Research Article



According to The American Congress of Obstetricians and Gynecologists (ACOG), the prevalence of hypothyroidism in pregnancy is 2 to 5 %. There are a few studies from India which show the prevalence of hypothyroidism during pregnancy ranging from 4.8% to 11% [7]. Therefore this retrospective study was conducted to study the prevalence of hypothyroidism in pregnancy in women attending antenatal clinic at ESI hospital, Hyderabad.

## MATERIALS AND METHODS

This study was conducted in the department of obstetrics and gynecology in ESI hospital, Sanathnagar, Hyderabad from April 2015 to July 2015 after clearance from ethics committee. Thyroid profile is being done for all pregnant women as a routine antenatal test in our hospital. We collected the results of thyroid function tests of 1062 women who attended the antenatal OPD during this period. The tests included in our antenatal profile are:

Complete blood picture, Complete urine examination, Blood grouping and Rh typing, RBS, Blood urea, S. Creatinine, HIV, HbsAg and T3, T4 and TSH.

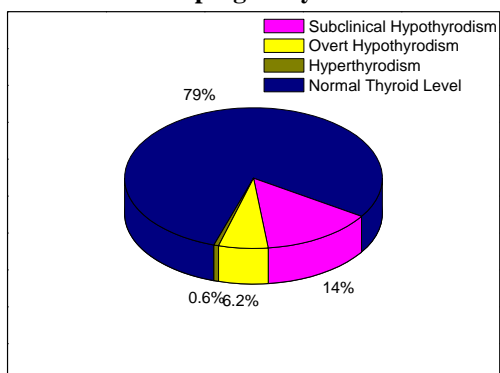
## RESULTS

In the present study, a total of 1062 cases were studied. All the subjects belonged to either poor or middle socioeconomic status. Out of 1062 cases, 149 (14.03%) cases demonstrated subclinical hypothyroidism, 66 cases (6.2%) had overt hypothyroidism and 7 cases (0.6%) had hyperthyroidism (Table 1 and figure 1). The mean age of the mothers was 22.1 years and the subjects belonged to either poor or middle socioeconomic status. The results of the present showed that 19% had hypothyroidism prior to pregnancy, 45% had hypothyroidism on routine screening in 1<sup>st</sup> trimester and 21 % in 2<sup>nd</sup> trimester and 14 % in 3<sup>rd</sup> trimester (Figure 2). Present study shows 70% subclinical hypothyroidism and 30% overt hypothyroidism out of total hypothyroid cases (Figure 3).

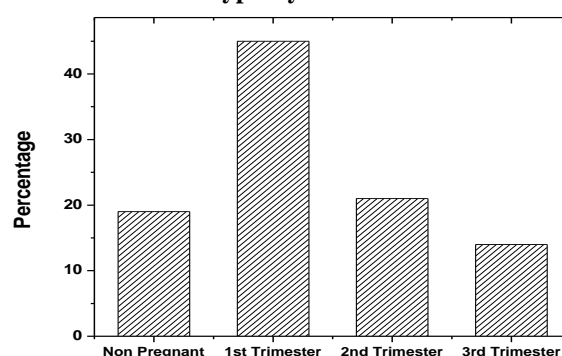
**Table 1. Distribution of Patients in Relation Thyroid Dysfunction in Pregnancy**

Complications	No. of Patients	Percentage
Hypothyroidism (total)	215	20.1%
• Subclinical	149	14.03%
• Overt	66	6.2%
Hyperthyroidism	7	0.6%

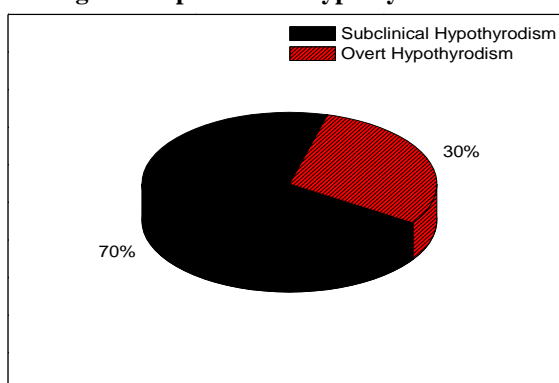
**Figure 1. Pie chart depicting thyroid dysfunction in pregnancy**



**Figure 2. Distribution of patient to trimester for hypothyroidism**



**Figure 3. Spectrum of hypothyroidism**



## DISCUSSION

This retrospective study was aimed to know the prevalence of hypothyroidism in pregnant women attending antenatal clinic of ESI Hospital. Subclinical Hypothyroidism is defined as an elevated TSH level with a normal level of circulating free T4. The prevalence of Subclinical Hypothyroidism during pregnancy in the US is estimated to be 0.25–2.5% [8]. The present study results showed 20.1% prevalence, 14.03% being subclinical hypothyroidism and 6.6% overt hypothyroidism. The upper limit of TSH is taken as 2.5mIU/L in 1<sup>st</sup> trimester and 3mIU/L in 2<sup>nd</sup> and 3<sup>rd</sup> trimester.

According to ACOG, the prevalence of subclinical hypothyroidism has been anticipated to be between 2% and 5%. It has been stated that benefit of treatment to either mother or fetus has not yet been demonstrated in pregnant women with subclinical hypothyroidism and routine screening for subclinical hypothyroidism is not currently recommended [9]. Targeted case finding has been the preferred method due to its practicality, cost-effectiveness, and lack of any studies which conclusively demonstrate the superiority of universal screening over targeted case finding [10]. Targeted screening includes women who either have a positive family history, goiter, Type I diabetes, pre-existing thyroid disorder, preterm delivery, antibody positivity, or prior therapeutic head or neck irradiation, and so on. Currently, position statements issued by the Thyroid, Endocrine and Obstetric organizations do not recommend universal screening.

A study done by Vaidya and co-workers reported that by targeted thyroid screening testing of only the high-risk group would miss about one third of pregnant women with overt/subclinical hypothyroidism [11]. A study done in North India to know the prevalence of subclinical hypothyroidism concludes that there is a high prevalence of hypothyroidism (14.3%), majority being subclinical in pregnant women during first trimester. Another study done in southern urban population of India has shown the prevalence of subclinical hypothyroidism to be 9.2 % [12]. Similar findings were also seen in the present study.

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Sahu and co-workers have done thyroid function during second trimester in high-risk pregnant women and reported that prevalence of thyroid disorders, especially overt and subclinical hypothyroidism, was 6.47%. Further, significant adverse effects on maternal and fetal outcome were seen emphasizing the importance of routine antenatal thyroid screening [13]. Study done by Rao and co-workers demonstrates that hypothyroidism has a statistically significant relationship with recurrent pregnancy loss in the first trimester and suggests that diagnosis of hypothyroidism could help couples with recurrent pregnancy loss to have a successful outcome in subsequent pregnancies [14]. Subclinical Hypothyroidism in pregnancy has been associated with adverse maternal outcomes in observational studies including eclampsia, pre-eclampsia, placental abnormalities, miscarriages, pre-term labor, and low birth weights [4,5,15,16]. There has been a wide geographic variation in prevalence of hypothyroidism during pregnancy; it varies from 2.5% from the west to 11% from India. It seems the prevalence is more in Asian countries compared with west.

## CONCLUSION

All the above studies have shown a very high prevalence of hypothyroidism in Indian population. Universal screening for hypothyroidism may benefit both mother and the fetus. The present study supports universal thyroid screening to improve maternal and fetal outcomes.

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**CONFLICT OF INTEREST:** Nil

## STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.



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