



Prevalence of Hypothyroidism in Pregnancy in a Tertiary Care Hospital

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Abstract: **Introduction:** Thyroid disorders are the most common endocrine disorders affecting women of reproductive age. The most frequent thyroid disorder in pregnancy is maternal hypothyroidism. During early pregnancy, the fetus is totally dependent on maternal thyroid hormone supply. Thyroid hormone is critical for fetal brain and intellectual development. Thyroid hormone is also important for some preventable pregnancy complications like anaemia, low birth weight, abruptio placenta, preeclampsia, etc., which pose special risks for the mother and developing fetus. **Aim of the study:** To assess the prevalence of hypothyroidism in pregnant women and thus ensure appropriate treatment for the wellbeing of the mother and baby. **Methods:** This prospective observational study was conducted on 113 pregnant women at US Bangla Medical College Hospital, Dhaka, Bangladesh, who attended obstetrics outdoors. Women were randomly chosen irrespective of age, parity, residence, and socioeconomic status. Women with multiple pregnancies or having any pre-existing medical disorder were excluded. All women were investigated for TSH along with routine pregnancy tests. All were divided into two groups: normal/euthyroid and abnormal/thyroid disorders, considering their thyroid status. **Result:** We found the prevalence of thyroid dysfunction in pregnancy was 17.7%, with hypothyroidism being 15.93%, of which 10.62% were subclinical hypothyroidism, 5.31% were cases of overt hypothyroidism, and 1.77% were cases of hyperthyroidism. **Conclusion:** This study showed an increased prevalence of hypothyroidism in pregnancy, recommending a need for universal screening for all pregnant women in the early weeks of pregnancy. This study aims at validating the efficacy of the above-mentioned screening for a better pregnancy outcome.

Keywords: Hypothyroidism, Prevalence, Screening.

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INTRODUCTION

Thyroid disorders are the second most common endocrine disorders affecting women in the reproductive period [1]. It is currently the most sought-after topic of research in clinical endocrinology [2]. Assessment of thyroid function is pertinent during pregnancy because of its proven influence on fetomaternal outcomes. As soon as pregnancy is established, thyroid physiology starts

altering, which continues throughout the gestation but is reversible postpartum [3]. Hypothyroidism during pregnancy has adverse effects on both the mother and the child. Children born to an untreated mother with hypothyroidism have profound effects on their future intellectual development [4]. Physiological changes during pregnancy also affect the thyroid gland and its function. During pregnancy, the thyroid gland increases in size by 10% in iodine-

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sufficient countries and to a greater extent in iodine-deficient countries [5]. Production of thyroid hormone and iodine requirements both increase by approximately 50% during pregnancy as part of physiology [6]. In addition, pregnancy is a stressful condition for the thyroid gland, resulting in hypothyroidism in women with limited thyroid reserve or in an iodine deficiency state. Reduced intellectual function in the offspring, congenital anomalies, and cretinism are most commonly seen in the babies of women, where iodine deficiency is the cause of hypothyroidism [7]. Moreover, prenatal and postnatal adverse effects, including attention deficit and hyperactivity syndrome, have been reported in children born to hypothyroid mothers [8, 9]. During the first trimester, approximately 1 in 10 pregnant women develop antibodies to TPO or thyroglobulin, and hypothyroidism develops in roughly 16% of these women. There is a wide geographical variation in the prevalence of thyroid disorders and their fetomaternal complications in pregnant women [10]. The prevalence of hypothyroidism is around 2.5% according to western literature [11], and there are few reports from India where the prevalence of hypothyroidism varies from 4.8% to 11% [12, 13] In light of the high prevalence of thyroid disorders in pregnancy, this pregnancy was carried out to assess the prevalence in our country, thus validating the inclusion of thyroid screening tests as routine tests during pregnancy and thus improving maternal-fetal outcomes.

Objectives

- The aim of this prospective study was to assess the prevalence of hypothyroidism in pregnant women and thus ensure appropriate treatment for the wellbeing of the mother and baby.

METHODOLOGY & MATERIALS

This prospective observational study was carried out from January 2018 to July 2018 at US Bangla Medical College Hospital, Borpa, Narayanganj. We recruited 113 antenatal women attending obstetrics outdoors. Informed consent was obtained from all women. Women were chosen irrespective of age, gestational age, parity, residence, and socioeconomic status. Women with multiple pregnancies and gestational trophoblastic diseases were excluded. Detailed history taking, clinical examination, routine pregnancy investigations, and serum thyroid stimulating hormone testing were done.

The reference range used in the study was based on the guidelines of the American Thyroid Association (2011) for the diagnosis and management of thyroid disease during pregnancy

and the postpartum period [2]. According to the guidelines, if trimester-specific ranges for TSH are not available in the laboratory, the following reference ranges are recommended: first trimester 0.1–2.5; second trimester 0.2–3.0 mIU/ml. Women with TSH above the normal range are concerned with the estimation of their FT4 level to classify them as subclinical or overt hypothyroidism. High TSH values and low FT4 suggest overt hypothyroidism, and elevated TSH with normal FT4 suggests subclinical hypothyroidism. The collected data were analyzed by using the Statistical Package for Social Science (SPSS-21) and Microsoft.

RESULT

A total of 113 pregnant women were enrolled in the study as per the inclusion criteria. Serum TSH was done on the first visit in all cases. A trimester-specific normal range of S.TSH was considered for detecting those with thyroid disorders. FT4 levels were used to reclassify those with thyroid disorders as having subclinical or overt hypothyroidism. TSH with low FT4 suggests overt hypothyroidism, and elevated TSH with normal FT4 suggests subclinical hypothyroidism. Of the 113 antenatal women attending the patient department who were evaluated for thyroid status, 18 (15.93%) had hypothyroidism, 2 (1.77%) had hyperthyroidism, and 93 (82.30%) were found to be euthyroid. Here, the prevalence of hypothyroidism is 16% among pregnant women [Table-1]. Women with thyroid disorders were regrouped according to their TSH and FT4 levels. Out of 113 women, 12 (10.62%) had subclinical hypothyroidism, 6 (5.31%) had overt hypothyroidism, 2 (1.77%) had hyperthyroidism, and 93 (82.30%) were found to have euthyroid [Table-2]. The age of the screened population was noted to show the prevalence of thyroid disorders with age. 43 (38.05%) women were <20 years of age, and among them, 6 (13.95%) had hypothyroidism, no one had hyperthyroidism, and 37 (86.05%) had euthyroidism. 41 (36.28%) women were between the ages of 20 and 25, and among them, 7 (17.07%) had hypothyroidism, no one had hyperthyroidism, and 34 (82.93%) had euthyroidism. 24 (21.24%) were in the age group of 26–30, and among them, 5 (20.83%) were found to have hypothyroidism, 1 (4.17%) was found to have hyperthyroidism, and 18 (75.00%) had euthyroidism. 6 (5.31%) women were in the >30 year age group, and among them, 5 (16.67%) were found to have hypothyroidism, 1 (16.67%) was found to have hyperthyroidism, and 3 (0.18%) had euthyroidism [Table- 3]. The BMI of the screened population was noted to show a correlation between thyroid disorders and body weight. Hypothyroidism vs. euthyroidism in the BMI <18.5 group was 2 (10.53%) vs. 17 (89.47%), in the 18.5–<25 group was 7 (12.73%) vs. 46 (83.64%), in the 25–<30 group was 7

(24.14%) vs. 23 (79.31%), and in the ≥ 30 group was 2 (22.22%) vs. 7 (77.28%) [Table 4].

Table 1: Distribution of the study population according to thyroid status (N=113)

Thyroid status	No of patients	Percentage
Euthyroid	93	82.30%
Hypothyroid	18	15.93%
Hyperthyroid	2	1.77%

Table 2: Distribution of the study population according to subtype of thyroid disorder (N=113)

Subtypes of thyroid disorder	No of Patients	Percentage
Euthyroid	93	82.30%
Subclinical hypothyroidism	12	10.62%
Overt hypothyroidism	6	5.31%
Hyperthyroidism	2	1.77%

Table 3: Age-wise distribution of the screened population (N=113)

Age	No. of women	Hypothyroid n(%)	Hyperthyroid n(%)	Euthyroid n(%)
<20	43(38.05%)	6(13.95%)		37(86.05%)
20-25	41(36.28%)	7(17.07%)		34(82.93%)
26-30	24(21.24%)	5(20.83%)	1(4.17%)	18(75.00%)
>30	6(5.31%)	5(16.67%)	1(16.67%)	3(0.18%)
Total	113			

Table 4: Relationship of thyroid disorder \bar{c} BMI (N=113)

BMI-kg/m ²	Total No of Women	Hypothyroidism n(%)	Hyperthyroidism n(%)	Euthyroidism n(%)
<18.5	19(16.81%)	2(10.53%)		17(89.47%)
18.5-<25	55(48.67%)	7(12.73%)	2(3.64%)	46(83.64%)
25-<30	29(25.66%)	7(24.14%)		23(79.31%)
≥ 30	9(7.96%)	2(22.22%)		7(77.78%)
Total	113			

DISCUSSION

A healthy thyroid gland aids in coping with the increased physiological demands of pregnancy and maintains proper thyroid activity. Any change in maternal thyroid hormone levels has an impact on fetomaternal outcomes. The prevalence of hypothyroidism in the present study is 15.93%. This study is comparable to the study by Sahu *et al.*, whose reported prevalence of hypothyroidism is 12.7% [13]. There are some other reports from India, where the prevalence of hypothyroidism varies from 4.8% to 11% [12]. However, the prevalence in the study is not comparable to the prevalence in Western countries, where it is 2.5%.

In Table 2, we see that in the pregnant population, 82.30% were euthyroid and 1.77% were hyperthyroid. Of hypothyroid women (15.93%), 10.62% were subclinical, and 5.31% had overt hypothyroidism. This is higher than the reported prevalence in other studies from India and abroad. Dhanwal *et al.*, observed a prevalence of hypothyroidism to be around 14.3%, and the majority of those women had subclinical hypothyroidism, while Gayathri *et al.*, reported a 2.8% prevalence of subclinical hypothyroidism [14, 15]. In the study by Sahu *et al.*, it was reported that

among hypothyroidism prevalence (12.7%), overt and subclinical hypothyroidism were 4.58% and 6.47%, respectively [13].

Regarding the association of hypothyroidism during pregnancy with age and BMI, there is a paucity of studies, probably due to the physiological changes in the thyroid gland during pregnancy. The guidelines of the ATA from 2011 included age >30 years as one of the risk factors for hypothyroidism in pregnancy. The study done by Vaidhya B. *et al.*, in 2007 showed a lower age compared to the western studies [16]. In our study, we found the highest prevalence in women with age >30 years. It is comparable to the study by Ajmani *et al.*, where it is shown that there is an increased occurrence of thyroid disorders with advancing age [17].

In our study (Table 4), we found that the prevalence of hypothyroidism increases with increased BMI. It was 10.53%, 12.73%, 24.14%, and 22.22%, where BMI was <18.5 kg/m², 18.5-<25 kg/m², 25-<30 kg/m², and ≥ 30 kg/m², respectively. The study by Ajmani *et al.*, also showed an increase in the incidence of thyroid disorder with an increasing BMI [17].

Based on our findings, we promote universal thyroid screening for all women, ideally during the pre-pregnancy phase or at their first antenatal appointment.

Limitations of the Study

This observational study was conducted in only one selected hospital in Dhaka city, so the results of the study may not reflect the exact picture of the country. As well as small sample size was also a limitation of the present study due to time constraints. Therefore, in future further study may be under taken with large sample size.

CONCLUSION

Thyroid dysfunction in pregnancy is associated with adverse pregnancy outcomes. In this study, the prevalence of hypothyroidism is 15.93%. On assessing the risk factors for developing thyroid disorder during pregnancy, an increase in incidence was seen with increasing maternal age and increasing BMI. To reduce the risk associated with thyroid disorder during pregnancy, universal screening at the first antenatal visits, preferably, and pre-conceptual screening for thyroid disorder may be considered routine tests.

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