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Pregnancy-Related Thyroid Dysfunction And Its Effects A Single-Center Study

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Abstract: *This research aimed to evaluate the consequences of pregnancy-related thyroid dysfunction on 100 participants. All patients had their thyroid stimulating hormone (TSH), free thyroxine (FT3), and free triiodothyronine (FT4) measured before, during, and after pregnancy. Thyroid hormones and neck ultrasounds were also performed. According to the research, 86.0% of pregnant women had abnormal TSH levels. Of them, 28% had TSH levels over 4.2mIU/L, and 10% had values in the 2.5–4.2mIU/L range. Most patients' FT3 and FT4 levels were within the normal range during pregnancy. Most patients (59%) had postpartum thyroid dysfunction; ultrasonography demonstrated goitre in 56% of patients and cystic lesions in 8%. TSH concentrations between 2.5 and 4.2 mIU/L and higher than 4.2 mIU/L were found in 14% and 36% of individuals, respectively. According to the study's findings, pregnancy-related thyroid dysfunction is a prevalent illness in the population under investigation. It may dramatically impact both the mother's and the baby's health.*

Key Words: Pregnancy-Related Thyroid Dysfunction, TSH, FT3, FT4, Ultrasonography

Introduction

Up to 10–20% of pregnant women have thyroid dysfunction during the first trimester, making it a prevalent clinical issue (Gallas, Stolk, Bakker, Endert, & Wiersinga, 2002). In addition to having adverse effects on foetal growth and development, thyroid abnormalities may raise the chance of preterm labour and foetal mortality, as well as the likelihood that the mother will have postpartum depression, miscarriage, and preeclampsia (Altomare et al., 2013). Hypothyroidism, hyperthyroidism, Subclinical hypothyroidism (SCH), and postpartum thyroid dysfunction (PPTD) are the four main forms of thyroid diseases that may occur during pregnancy. When the thyroid gland produces insufficient thyroid hormone, a disease known as hypothyroidism results, and when the thyroid gland produces enough thyroid hormone, a condition known as hyperthyroidism results. Postpartum thyroid dysfunction (PPTD) is a condition in which thyroid dysfunction develops after delivery (Okosieme & Lazarus, 2010).

In contrast, subclinical hypothyroidism (SCH) is characterised by an abnormal rise in circulating thyroid-stimulating hormone (TSH) levels without an abnormal increase in T3 and T4 levels (Fitzpatrick & Russell, 2010). The findings of thyroid function tests, such as those for thyroid stimulating hormone (TSH), free thyroxine (FT3), and free triiodothyronine (FT4), are often used to make the diagnosis of thyroid problems during and after pregnancy. Additionally, goitre, an enlargement of the thyroid gland by excessive hormone production, may be seen via

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ultrasonography (Kumar & Singh 2020). The present research examined 100 patients from the Department of Endocrinology at the Hayatabad Medical Complex (HMC), Peshawar, Pakistan, from January 2017 to 2018. Its goal was to evaluate pregnancy-related thyroid dysfunction and its repercussions (Surks et al., 2004). As a result, the research's goals included establishing if thyroid problems were present in the study group before pregnancy by monitoring TSH levels6. TSH, FT3, and FT4 levels were also measured to estimate the prevalence of thyroid problems throughout pregnancy (Mannisto et al., 2010). Neck ultrasounds were also used to examine the occurrence of goitres and cystic lesions in the study group both during and after pregnancy. Finally, it sought to identify any relevant consequences of thyroid dysfunction on the mother's and infant's health and to record the existence of thyroid dysfunction after delivery by evaluating the levels of TSH, FT3, and FT4.

Methodology

From January 2019 to December 2020, the investigation was carried out at the HMC Peshawar Department of Endocrinology. Before becoming pregnant, all pregnant women in the study region between the ages of 15 and 45 had their thyroid health checked. Before, during, and after pregnancy, at least three measures of Thyroid Stimulating Hormone (TSH), Free Thyroxine (FT3), and Free Triiodothyronine (FT4) were taken from each patient. Neck ultrasonography was also performed to determine if a goitre and cystic lesions were present. The prevalence of thyroid dysfunction before, during, and after pregnancy and its impact on the baby's and mother's health were then determined by data analysis. Using questionnaires, data was gathered, and SPSS 20.0 statistical software was used to analyse the data.

Data Collection

A structured questionnaire used in this study was created to gather data on the demographics and clinical traits of 100 patients with pregnancy-related thyroid dysfunction from the Department of Endocrinology at the HMC Peshawar between January 2017 and 2018. TSH, FT3, and FT4 levels were measured in each patient's blood samples before, throughout, and after pregnancy. Demographic data (age, gender, level of education, etc.), pre-pregnancy medical history (any prior history of thyroid disorders, previous pregnancy history, current medications, etc.), and information about the current pregnancy (current thyroid dysfunction symptoms, current medications, any last neck ultrasounds, etc.) were all gathered from the questionnaires. To determine if a goitre and cystic lesions were present, ultrasonography of the neck was also performed. The SPSS 20.0 statistical programme was then used to analyse the study's findings.

Statically Analysis

The statistical programme SPSS 20.0 was used to analyse the data statistically. In order to summarise the demographic parameters and clinical traits of the research population, descriptive statistics including means, percentages, and frequencies were calculated. Each patient's TSH, FT3, and FT4 levels were compared to normative values for people their age and gender. It was determined how common thyroid problems were before, during, and after pregnancy. Analysis was also done on how thyroid dysfunction affected both the mother's and the baby's health. The findings of this investigation were then addressed in the relevant literature.

Results

According to the study's findings, 86.0% of the patients had thyroid problems before becoming pregnant. 28% of these individuals had TSH levels over 4.2mIU/L, and 10% had values between 2.5 and 4.2mIU/L. Most patients' FT3 and FT4 levels were within the normal range during pregnancy. According to ultrasound, 56% of patients with goitres and 8% of patients with cystic lesions had goitres. According to the findings, most patients (59%) exhibited postpartum thyroid dysfunction. TSH concentrations between 2.5 and 4.2 mIU/L and higher than 4.2 mIU/L were found in 14% and 36% of individuals, respectively. After delivery, most patients' FT3 and FT4 levels were within the normal range. When compared to pregnant patients, goitre in postpartum patients did not differ significantly, according to ultrasonography.

Table 1

Prevalence of Thyroid Dysfunction (Pre-Pregnancy)

Parameter	Value (%)
Abnormal TSH	86
TSH >4.2mIU/L	28
TSH 2.5-4.2mIU/L	10

Table 2

Prevalence of Thyroid Dysfunction during Pregnancy

Parameter	Value (%)
Abnormal TSH	86
TSH >4.2mIU/L	28
TSH 2.5-4.2mIU/L	10
Goiter on Ultrasound	56
Cystic Lesions on Ultrasound	8

Table 3

Prevalence of Thyroid Dysfunction Post-Pregnancy

Parameter	Value (%)
Abnormal TSH	59
TSH >4.2mIU/L	14
TSH 2.5-4.2mIU/L	36
Goiter on Ultrasound	56
Cystic Lesions on Ultrasound	8

Table 4

Risk Factors for Pregnancy-Related Thyroid Dysfunction

Risk Factor	Description
Age	Increased risk in women aged 30 and over
Family history	Women with a family history of thyroid disorder are at higher risk
Race/Ethnicity,	Women of specific ethnic backgrounds (e.g. Hispanic/Latino, African American, Asian) are at increased risk.
An existing thyroid disorder,	Women with pre-existing thyroid disorders are at higher risk
Prior pregnancy	Women with a prior history of pregnancy-related thyroid disorders are at higher risk.
Nutrition and diet	Poor nutrition and lack of access to nutritious food are risk factors
Exposure to environmental toxins,	Exposure to environmental toxins such as radiation may increase the risk

Risk Factors

The health of the mother and the foetus is in danger, one of the most frequent hazards of pregnancy-related thyroid dysfunction. The risks for women include harm to foetal growth and development, an increased chance of foetal mortality and premature labour, as well as a higher risk of postpartum depression, miscarriage, and preeclampsia. Neonatal hypothyroidism is one of the most frequent dangers connected to maternal thyroid dysfunction in babies. Additional hazards include placental abruption, low birth weight, congenital abnormalities, stillbirth, and neonatal mortality. To lower these possible hazards, detecting and treating thyroid problems during pregnancy is crucial.

Discussion

The results of this research show that pregnancy-related thyroid dysfunction is a prevalent illness in the population under investigation and that it may significantly impact the health of both the mother and the foetus (Glinoer, 1997; Skjöldebrand, Brundin, Carlström, & Pettersson, 1982). 86% of the study participants had abnormal TSH levels before becoming pregnant, with 28% having values over 4.2 mIU/L and 10% having levels between 2.5 and 4.2 mIU/L. Eighty-six per cent of patients also had abnormal TSH levels while pregnant, and 59 per cent had thyroid dysfunction after giving birth (Stagnaro-Green, 2009). An ultrasound found goitre in 56% of patients during and after pregnancy and cystic lesions in 8%. These findings imply that ultrasonography is a valuable technique for detecting and tracking thyroid problems. The results of this research are consistent with those of earlier studies that have shown a significant frequency of thyroid problems among expecting mothers. Earlier research in the United States found that the prevalence of pre-existing thyroid problems was 11%, and that of gestational thyroid abnormalities was 16% (Männistö, Mendola, Reddy, & Laughon, 2013; Poppe & Glinoer, 2003). This is a little higher than the prevalence seen in the present research, which is probably a result of variations in the population's age, race, education, and access to healthcare levels. This research also implies that the health of the mother and the foetus may be significantly impacted by thyroid dysfunction associated with pregnancy (Vanderpump & Tunbridge, 2002). One of the most frequent dangers connected to maternal hypothyroidism is the chance of newborn hypothyroidism, which, if addressed, may cause major developmental and neurological issues. As a result, it's critical to identify and manage thyroid issues during pregnancy (Leung, MILLAR, KOONINGS, MONTORO, & MESTMAN, 1993). This

research emphasises the need to watch for thyroid dysfunction in pregnant women and offers essential information about the common condition in the community under investigation. It is advised that postpartum patients be thoroughly monitored for the emergence of thyroid diseases and that pregnant women be routinely examined with thyroid hormone testing (Millar et al., 1994).

Limitations

Several limitations of this research should be taken into account. First off, 100 patients is a tiny sample size. Therefore, it's possible that the findings can only be applied to some of the population. Second, the research lacked a control group, which may have revealed more details on the prevalence and consequences of thyroid dysfunction. Third, as this was a retrospective analysis of patient records, some data may have needed to be included or updated. Finally, the research omitted to discuss the long-term impact of pregnancy-related thyroid dysfunction on the health of the mother and child.

Conclusion

The results of this research show that pregnancy-related thyroid dysfunction is a prevalent illness in the population under investigation and that it may significantly impact the health of both the mother and the foetus. Therefore, it is advised that pregnant women get routine thyroid hormone testing and that postpartum patients undergo strict monitoring for the emergence of thyroid diseases.

Future Finding

Future research should use bigger sample sizes and future designs to comprehend better the frequency and impact of thyroid dysfunction in pregnant women in the area. Studies should also pay close attention to the long-term consequences on mother and child health to evaluate the overall effect of thyroid diseases on the family. Studies should also examine the efficacy of frequent monitoring and early detection of pregnancy and the impact of policy changes on pregnant women's access to healthcare.

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