

Evaluation of the Outcomes of Hypothyroidism in Pregnant Women

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Abstract: Background: Hypothyroidism may also affect the safety of pregnancy and the health of the fetus, such as the occurrence of miscarriage, premature birth, the effect on the mental development of the fetus, and high blood pressure during pregnancy. Based on previous studies, changes in thyroid function are more common in women, with some considering a 10:1 ratio compared to men. Within it, hypothyroidism occurs at a rate of 0.5-2.5% of all pregnancies, while subclinical hypothyroidism has a prevalence of 2-2.5% in pregnant women. Between 5-9% of patients develop thyroid disease after birth. **Objective:** This study aims to Evaluate the outcomes of hypothyroidism in pregnant women. **Patients and Methods:** A descriptive cross-sectional study was conducted for the evaluation of the outcomes of hypothyroidism in pregnant women from 4th February 2020 to 8th October 2021. this study was applied to 90 patients in different hospitals in Iraq. In this study, the patients were divided into two groups; the first was hypothyroidism which included 50 patients, while the second group included the control, which included 40 patients by using the SPSS program. **Results and Discussion:** The results of the study showed a convergence between control patients in terms of age, where the highest percentage was set for ages between 25-34. This study showed an increase in BMI, where the cases were identified as 35 ± 2.5 for patients and 28 ± 3.1 for control with a p-value of 0.0486. According to the economic level, our study showed that most of the patients were from the middle class and included 22 (44%) for patients, and 19 (47.5%) for control, with a p-value of 0.0431. In addition, An assessment was made for pregnant women with hypothyroidism and control, which included percentage and frequency, and the Apgar rating score did not show a wide difference between patients and control. **Conclusion:** In this study, we identified a statistically significant association between the incidence of problems in pregnant women with hypothyroidism, with a weak correlation between the control group and the frequency of difficulties. In the first group, a high association with the occurrence of complications was discovered, less than or equal to 0.05.

Keywords: Apgar score; Hypothyroidism; TSH; Cesarean section; and Gestational diabetes.

INTRODUCTION

Changes in thyroid function are more common in women; some consider a 10:1 ratio compared to men. Within them, hypothyroidism occurs with a frequency of 0.5-2.5% of all pregnancies, while subclinical hypothyroidism has a prevalence of 2-2.5% in pregnant women. Between 5-9% of patients develop postpartum thyroid disease [Stagnaro-Green, A. *et al.*, 2011]. Clinical hypothyroidism has been associated with gestational complications such as preterm delivery, low birth weight, abruptio placentae, hypertension, and stillbirth [Blatt, A.J. *et al.*, 2012]. Maternal thyroid hormones play a crucial role in the development of the fetal central nervous system, particularly during the first trimester, due to the inability of the fetal thyroid to secrete iodothyronines before the 10th week of gestation. On the topic of hypothyroidism during pregnancy, various studies have described an estimated prevalence of up to 25% of pregnancies when speaking of subclinical classification of the disease [Aguayo, A. *et al.*, 2013]. Hypothyroidism during pregnancy over the past 30 years has been associated with several adverse perinatal outcomes in both the mother and fetus. Among these are spontaneous abortion, stillbirth, preeclampsia,

gestational hypertension, gestational diabetes, preterm birth, reduced IQ in the offspring, preeclampsia, placental abruption, and impaired neurocognitive development [Negro, R. *et al.*, 2014]. Because of the aforementioned, publications have been created with recommendations for the TSH value indicated by the diagnosis. The following ranges have been established for normal TSH; for the first trimester, between 0.1 to 2.5 mU/L; for the second trimester, from 0.2 to 3 mU/L and for the third trimester, from 0.3 to 3 mU/L, the upper limit of normal prescribed for TSH is lower Less than 2.5 mU/L in the first trimester and less than three mU/L in the second and third trimesters [Chan, S. *et al.*, 2015]. Later in 2014, Díez, *et al.*, They agree on the same recommendation in terms of reference values, but they also emphasized that their use should only be made if their reference ranges are not available for each quarter [Sheehan, P.M. *et al.*, 2015]. This leads to different findings in other studies, the FaSTER study being mentioned, with 10,990 pregnant women, finding an upper limit of normal for TSH of 4.28 mU/l in the first trimester. Studies conducted in Spain show similar results [Maraka, S. *et al.*, 2015]. In Catalonia, Vila and colleagues

described in their 2010 publication an upper limit for TSH found to be 5.76 mU/l. In Aragon, in 2009, the upper limit was 2.63 mU/l; in El Bierzo 3.59 mU/l, Cartagena 3.71 mU/l, Jaén 4.18 mU/l and Valladolid (4.05 mU/l), and as can be seen, although all results greater than 2.5 mEq/L, it appears to be affected by racial, ethnic, and even nutritional differences, as emphasized in the most recent guidelines published by the American Thyroid Association (ATA) in 2017 [Abalovich, M. *et al.*, 2012], in which these differences are considered and in relation to the results of other studies. , the working group mandated to achieve it has identified a recommendation that is being considered so far, which is to use an upper limit nine a TSH value of 4.0 mIU/L as long as there are no reference values in pregnant women from that population, taking into account the reference range for normal pregnant women You do not have thyroid disease or antithyroid antibodies, and you must have an adequate amount of UG [Lazarus, J. *et al.*, 2014]. In light of this, screening tests for gestational and congenital hypothyroidism have been performed. However, in our setting, we do not know the true prevalence or perinatal outcome of these pregnant women [www.cdc.gov]. A major limitation of accessing this knowledge is the fact that the demand for a TSH test is not defined as standard in Colombian prenatal surveillance manuals [Wallace, P.J. *et al.*, 2014]. Among the national guidelines are “Technical Standard for Early Detection of Pregnancy Disorders,” published by the Ministry of Health in 2000, “Clinical Practice Guidelines for the Prevention, Early Detection and Treatment of Complications of Pregnancy, Childbirth and Puerperium,” published by the Ministry of Health - Social Protection and Colsensia in 2013 [www.optum.com], and “Handbook of Prenatal Control and Risk Factors,” conducted by the Bogota Region Health Secretariat and the Bogota Society of Obstetrics and Gynecology (ASBOG). None of them has a standard that requires thyroid testing as part of prenatal or preconception control.

Requesting HRT was only found to be an option of request in pregnant women with risk factors. In addition, in order to access the research for thyroid disorders, the pregnant woman must obtain an evaluation by the specialist, where he determines the appropriateness of his study [Dashe, J.S. *et al.*, 2005].

PATIENTS AND METHODS

A descriptive cross-sectional study was conducted for the evaluation of the outcomes of hypothyroidism in pregnant women in the year 2020-2021. this study was applied to 90 patients in different hospitals in Iraq. In this study, the patients were divided into two groups; the first was hypothyroidism which included 50 patients, while the second group included the control, which included 40 patients by using the SPSS program. This study dealt with the evaluation of pregnant women, where factors were studied age, BMI (kg/m²), Charlson index if 0, 1, ≥ 2 , and income level if low, middle, or high. In addition, the study expanded to evaluate the history of recurrent pregnancy loss and history of thyroid disease, as shown in Table 1.

This study expanded on the evaluation of pregnant women samples to find out gestational complications and outcomes between hypothyroid and control groups, which include preterm labor, preterm birth, cesarian section, post-term delivery, gestational diabetes, and gestational hypertension, as it is shown in Table 2.

In addition, a study was carried out of outcomes of hypothyroid and control groups by Apgar score for both patient and control groups, which were divided into frequency and percentage, which can be seen in Figure 1.

In Table 3, this study was implemented with an estimation of outcomes of patients in comparison with the control was studied based on the evaluation of R-correlation and Sig.

RESULTS

Table 1: Demographic results of pregnant women for patients and controls

Variables	Hypothyroidism (50)	Controls (40)	P-value
Age			
18-24	7 (14%)	6 (15%)	0.049
25-34	22 (44%)	16 (40%)	0.047
35-44	18 (36%)	13 (32.5%)	0.0477
45-50	3 (6%)	5 (12.5%)	0.025
BMI	35±2.5	28±3.1	0.0486
Charlson Index			

0	22 (44%)	19 (47.5%)	0.0486
1	16 (32%)	13 (32.5%)	0.0497
≥ 2	12 (24%)	8 (20%)	0.042
INcome Level			
low	19 (38%)	15 (37.5%)	0.0487
Middle	22 (44%)	19 (47.5%)	0.0431
High	9 (18%)	6 (15%)	0.0453
History of recurrent pregnancy loss	8 (16%)	3 (7.5%)	0.0346
History of thyroid disease	12 (24%)	5 (12.5%)	0.035

Table 2: Gestational Complications and Outcomes Between Hypothyroid and Control Groups

Variables	Hypothyroidism (50)	Controls (40)	P-value
Preterm labor	7 (14%)	9 (22.5%)	0.036
Preterm birth	11 (22%)	6 (15%)	0.032
Cesarian section	14 (28%)	12 (30%)	0.048
Post-term delivery	9 (18%)	7 (17.5%)	0.049
Gestational diabetes	5 (10%)	2 (5%)	0.035
Gestational hypertension	4 (8%)	4 (10%)	0.048

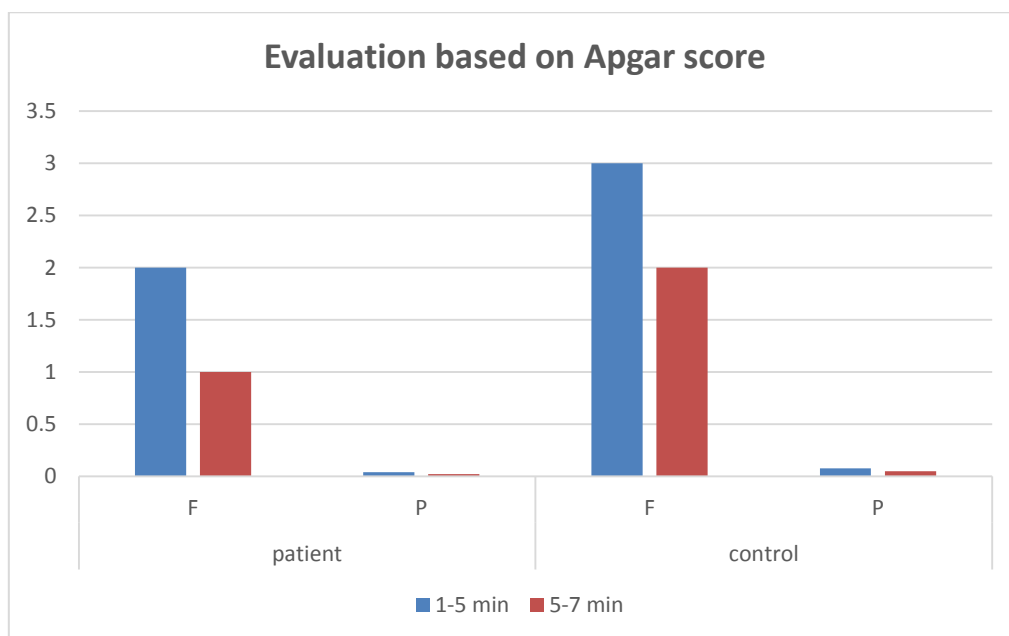


Figure 1: Outcomes of Hypothyroid and Control Groups by Apgar score

Table 3: Estimation of outcomes of patients in comparison with control

Variable	Outcomes of hypothyroidism in pregnant women	Patients	Control
<i>R correlation</i>	<i>1/0</i>	+0.73	-0.68
<i>Sig</i>	--	0.062	0.62
<i>N</i>		90	

DISCUSSION

This study identified 90 pregnant women with hypothyroidism from 4th February 2020 to 8th October 2021. Among these patients, they were divided into two groups, the first being patients with hypothyroidism and the second being control. The results of the study showed a convergence between control patients in terms of age. Although patients rated 7 (14%) for patients and 6 (15%)

with a P-VALUE of 0.049 for ages 18-24, 22 (44%) for patients, and 16 (40%) with a P-VALUE 0.047 for ages 25-34, 18 (36%) patients and 13 (32.5%) controls ages 35-44, 3 (6%) patients and 5 (12.5%) controls ages 45-50. However, the highest percentage was set for ages between 25-34. This study showed an increase in BMI, where the cases were identified as 35 ± 2.5 for patients and 28 ± 3.1 for control with a p-value of 0.0486. also, the

results of the study showed the mean of the Charlson index, where the evaluation was based on a rate between 0, 1, ≥ 2 , where it showed the highest average of cases in the Charlson index (0), where the cases reached 22 (44%) for patients and 19 (47.5%) for control with p-value 0.0486, while it reached the lowest when Charlson index ≥ 2 where patients were 12 (24%) and control 8 (20%) with p-value 0.042. [Hershman, D.L. et al., 2015; Deyo, R.A. et al., 1992]

In addition to the economic level, We were able to adapt analyses based on available data on numerous possible confounding variables, most notably socioeconomic measurements and obstetric pathological states [Stirrat, G.M, 1990; Wang, S. et al., 2012], but this study was also hampered by its retrospective and observational nature, as well as its small size where the economic factor affects pregnancy, as not all patients have the same standard of living [Negro, R. et al., 2010; Maraka, S. et al., 2016], which forces some patients to go to hospitals of high quality and others to hospitals of lower quality, which our study showed that most of the patients were from the middle class and included 22 (44%) for patients, 19 (47.5%) for control, with a p-value of 0.0431. This study included the history of recurrent pregnancy loss for 8 (16%) patients and 3 (7.5%) for control with a p-value of 0.0346. Moreover, this study also showed the history of thyroid disease for patients 12 (24%) for control 5 (12.5%) with a p-value of 0.035, as shown in Table 1. [Haymart, M.R, 2010]

This study also explains gestational complications and outcomes between hypothyroid and control groups, as the complications were evaluated for both hypothyroidism and control groups and included preterm labor, preterm birth, cesarian section, post-term delivery, gestational diabetes, gestational hypertension, where the most affected cases were in cesarian section, which included 14 (28%) for patients and 12 (30%) for control, with a P-value of 0.048. This assessment indicated that women at high risk of pregnancy problems were more likely to take thyroid hormone can be see in Table 2. [Singh Ospina, N. et al., 2015]

An assessment was made for pregnant women with hypothyroidism and control, which included percentage and frequency, and the Apgar rating score did not show a wide difference between patients and control, as shown in Figure 1.

This study was conducted to assess patients and control groups by relying on R correlation +0.73 for patients and -0.68 for the control group, while Sig included 0.062 for the patients' group and 0.62 for the control group.

CONCLUSION

In this study, we conclude that there is a statistically significant relationship between the prevalence of complications in pregnant women patients who suffer from hypothyroidism, where a weak correlation was found on the control group and the prevalence of complications. As for the first group, a strong correlation was found, less or equal to 0.05, to the prevalence of complications. Hypothyroidism can impact pregnant women and expose them to health risks such as anemia, low birth weight, pre-eclampsia, and miscarriage; in addition to the likelihood of adverse effects on the fetus, thus it is critical that the thyroid gland operate normally throughout pregnancy.

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