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Quality of Life of Pregnant Patients in Iraq Undergoing Thyroidectomy

Dr. Alyaa Kamil Faleeh[1], Dr. Alaa Ahmed Kattaa[2], and Dr. Zainab Sabeeh Abd Ul Razzaq[3]

[1]M.B.Ch.B., D.O.G. (Specialist Obstetrician and Gynecologist), Iraqi Ministry of Health, Al-Anbar Health Directorate, Ramadi Teaching Hospital for Maternity and Children, Anbar, Iraq

[2]M.B.Ch.B., D.G.S., C.A.B.S. \ (General Surgery), Iraqi Ministry of Health, Al-Anbar Health Directorate, Department of Surgery, Al-Ramadi Teaching Hospital, Anbar, Iraq

[3]M.B.Ch.B., C.A.B.O.G., (Specialist Obstetrician and Gynecologist), Certified by the Arab Board of Health Specialization in Obstetrics and Gynecology, Iraqi Ministry of Health, Karbala Health Directorate, Hindi General Hospital, Karbala, Iraq

Abstract: The present study has been designed to assess the outcomes and quality of life (QOL) of Iraqi pregnant women in comparison to a control group. The study population is comprised of 200 patients, which is further divided into two groups: 120 pregnant women and 80 non-pregnant women. A cross-sectional study was conducted in several hospitals in Iraq, utilising data from 2022. The study period extended from 2022 to 2024. The quality of life of patients was assessed using a questionnaire to ascertain their general health characteristics before and after surgery. The SF-36 questionnaire was administered to measure thyroiditis, and a questionnaire was used to measure anxiety and depression. Sociodemographic variables were also considered. The study found no statistically significant differences in demographic characteristics and general data of Iraqi patients according to age, obesity, and comorbidities. However, the results related to the quality of life of patients are noteworthy. It was observed that fatigue in the group of pregnant women after thyroidectomy poses a significant challenge that is not readily addressed, and this factor has a substantial impact on the quality of life of the patient post-surgery. If this problem is not effectively addressed, the patient's recovery ability and the effectiveness of the recovery process are likely to be compromised. The findings of our current study, both domestically and internationally, suggest a substantial impact of pregnancy on the quality-of-life post-thyroidectomy, accompanied by notable variations in the recovery period and recurrence rate among patients ($P < 0.001$). It is evident that pregnant patients experience a diminished quality of life. The underlying reasons for this phenomenon may be attributable to the fact that patients undergo more severe functional impairment after surgery, experience heightened pain, and undergo more pronounced physical changes, which can lead to increased exposure to stress, depression, and pessimism, thereby affecting their postoperative recovery.

Keywords: Pregnant, Thyroidectomy, Quality of life, Surgery, Recovery, Parathyroid glands, Lobectomy, Activities, Health, Physical health.

INTRODUCTION

Pregnancy and childbirth in women with extragenital diseases represent a significant challenge for obstetricians. Among the range of somatic diseases, endocrine diseases, including diabetes, thyroid diseases, and obesity, are of particular concern [https://gis.cdc.gov, 2021]. The advent of hormone replacement therapy for these conditions, aimed at preserving fertility, has introduced a new dimension to the obstetrician's repertoire. The focus now shifts to enhancing perinatal care for patients afflicted with endocrine diseases [Glinoer, D, 2003; Shah, M. S, 2003]. The onset of pregnancy in women with somatic diseases, including endocrine diseases, is almost always associated with pathologies in the fetus and the future child. In pregnant women, thyrotoxicosis can be caused by diffuse goiter as well as the use of iodine preparations for therapeutic and diagnostic purposes [Alexander, E. K. *et al*., 2004]. Subacute lymphocytic thyroiditis during pregnancy is rare and is more common in the postpartum period. Thyrotoxicosis in trophoblastic tumors is associated with a pathologically elevated production of chorionic gonadotropin, which has a weak stimulating effect on the thyroid gland, which in some cases can lead to thyrotoxicosis. Most often, thyrotoxicosis during pregnancy is caused by flT3 [James, B. C. *et al*., 2018]. The underlying cause of this condition is the overproduction of thyroid hormones, precipitated by the presence of thyroid-stimulating antibodies (TSH-AT) in the serum. These autoantibodies bind to TSH receptors on thyroid cells, thereby stimulating the secretion of thyroid hormones and contributing to the development of thyrotoxicosis and the formation of goiter. In the case of DT3, the appearance of other autoantibodies in the serum, such as those directed against a microsomal antigen, thyroglobulin, and thyroid peroxidase, is also observed, resulting in the development of extrathyroidal disease [Malterling, R. R. *et al*., 2010; Haddow, J. E. *et al*., 1999; Hedman, C. *et al*., 2017].

Changes in thyroid function represent the second most prevalent endocrine disorder after diabetes, thus necessitating an analysis of current knowledge and the development of strategies for managing patients during pregnancy. The formation of the thyroid gland in the fetus occurs

***Corresponding Author:** Dr. Alyaa Kamil Faleeh

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during the fourth to fifth week of pregnancy, with the initial indications of hormonal activity emerging in the sixth to eighth weeks. The 9th-11th week marks the onset of secretory activity [Lazarus, J. H. *et al*., 2005], characterized by epithelial differentiation and the formation of the first individual follicles. The period of 10-12 weeks of intrauterine development is significant as it is when the fetal thyroid gland acquires the ability to accumulate iodine and synthesize iodothyronine. Following the 12th week, [Bongers, P. J. *et al*., 2020] the thyroid gland functions as an independent organ. From this point onwards, the formation of organs and systems occurs under the control of the fetal thyroid hormones. Gradually, the hypothalamic-pituitary-thyroid system becomes independent [Chen, W. *et al*., 2022]. By the 16th-17th week, the fetal thyroid gland is fully differentiated. It is important to note that thyroid-stimulating hormone (TSH) and maternal thyroid hormones are largely unable to cross the placental barrier, which may help to explain the early onset of autonomous activity of this endocrine gland in the fetus. [Landry, V. *et al*., 2022]

MATERIAL AND METHOD

A cross-sectional study was conducted in several hospitals in Iraq, utilizing data from 2022 to 2024. The study population comprised patients over 18 years of age who were diagnosed with direct thyroiditis and underwent their initial total thyroidectomy or lobectomy at the participating hospital. Patients with medullary or anaplastic thyroid cancer and those with a prior diagnosis of depression or anxiety were excluded from the study. Of the 120 eligible patients, 200 consented to participate in the study and were interviewed personally by the principal investigator. The SF-36 questionnaire was administered to measure thyroiditis where Sociodemographic variables were obtained from the clinical history, including age, sex, ethnicity, marital status, educational level, occupation, method of detection at the time of diagnosis, anthropometric measurements, type of surgery, lymph node dissection, histological type, and postoperative complications recorded at the time of the interview and considered provisional. A unique alphanumeric code was then assigned to each participant to ensure data anonymity.

The records were limited to women with thyroid disease who were pregnant. In this study, a comparison was made between the two groups, the patient and the control. The patient group included 120 patients. As for the control group, it included patients who were not pregnant but had undergone thyroidectomy.

The instruments utilized were the Short Form 36-Item Questionnaire (SF-36), a tool designed to assess health-related quality of life. The SF-36 employs a four-domain approach to evaluate physical health, encompassing physical functioning (FF), physical role limitations (PR), bodily pain (BP), and general health perception (GHP). A similar four-domain framework is employed in the assessment of mental health, comprising emotional role (ER), vitality (V), mental health (MH), and social function (SF). The SF-36 includes the concept **of** global change in the perception of current health status compared to the previous year, also known as the health transition (ET) status question. The answer to this question describes the change in perception regarding improvement or deterioration of health status during the past year. Two total scores were calculated to reflect the physical or mental domains of the SF-36: the physical health component (PHC) and the mental health component (MHC). In the present study, the standard version of the SF-36 questionnaire, which has been validated in Spanish, was utilized. To analyse the results, the percentage of responses at the extremes of each scale was examined. The data were recorded over the past four weeks through personal interviews, which ensured the completion of all items. To record responses, a questionnaire was designed in Excel.

RESULTS

Table 1: Description of demographic data for the patient and control groups

Variable	Patients, 120	Control, 80	P-value
Age			
Mean (sd)	30.9±1.1	29.43±1.66	0.982
W			
Mean (sd)	80.93±4.4	77.4±2.9389	0.72
H			
Mean (sd)	155.4±2.91	154.94±2.838	0.88

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Reasons for surgical removal, N			
Thyroid cancer.	33	16	0.22
Benign enlargement of the thyroid gland (goiter).	40	25	0.45
Overactive thyroid gland (hyperthyroidism).	27	20	0.71
Suspected thyroid nodules.	20	19	0.64
BMI			
Mean (sd)	31.1 (1.9)	30.9 (1.2)	0.811
Symptoms, N			
Bleeding.	29 (24.17)	20 (25.00)	0.892
Infection.	20 (16.67)	10 (12.50)	0.0654
(Hypoparathyroidism)	21 (17.50)	20 (25	0.0811
Damage to the parathyroid glands	30 (25.00)	12 (15)	0.032
Permanent hoarseness or weakness of the voice	20 (16.67)	18 (22.5)	0.0768
Education, N			
Primary	27 (22.50)	21 (26.25)	0.01
Secondary	32 (26.67)	30 (37.5)	0.0832
College	41 (34.17)	19 (23.7)	0.06178
High	20 (16.67)	10 (12.5)	0.099
Outcomes, N			
<1000$	60 (50)	40 (50)	0.00
>1000$	60 (50)	40 (50)	0.00

Table 2: Surgical results for both groups who underwent thyroidectomy

Variable	Patients, 120	Control, 80	P-value
Admission, n (p%)			
Elective	40 (33.33)	50 (62.5)	0.01
Urgent	80 (66.6)	30 (37.6)	0.03
ASA n (p%)			
II	55 (45.83)	40 (50)	0.882
III	65 (54.17)	40 (50)	0.82
Charlson n (p%)			
0-1	25 (20.83)	47 (58.75)	<0.001
>2	95 (79.17)	33 (41.25)	<0.001
History of thyroid surgery n (p%)			
yes	17 (14.17)	20 (25)	0.066
no	103 (85.83)	60 (75)	0.013
Anesthesia n (p%)			
General	80 (66.6)	60 (75)	0.09
Spinal	40 (33.4)	20 (25)	0.711
blood pressure n (p%)			
SBP (mmHg)	116.4±11.6	117.6±10.6	0.912
DBP (mmHg)	76.7±8.5	72.8±6.9	0.7134
PR (bpm)	75.6±5.6	72.1±5.9	0.242
Type of surgery n (p%)			
Lobectomy	20 (16.67)	16 (20)	0.6187
Total thyroidectomy	22 (18.33)	24 (30)	0.718
Subtotal thyroidectomy	30 (25)	21 (26.2)	0.991
Near-total thyroidectomy	48 (40)	19 (23.7)	0.0625
Operation time			
Mean (sd)	130.2 (20.9)	128 (17.1)	0.719

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Table 3: Evaluation of the general results preoperative according to SF-36

Variable	Patients, 120	Control, 80	P-value
Limitations in physical activities due to health problems	44.2 (3.3)	46.2 (4.5)	0.72
Limitations in social activities due to physical or emotional problems	49.2 (1.9)	50.1 (3.8)	0.6781
Limitations in usual role activities due to physical health problems	51.93±4.93	52.393±2.291	0.92
Physical pain	48±2.9	55.7±6.9	0.9812
General mental health (psychological distress and well-being)	56.3±5.2	56.7±3.5	0.772
Limitations in usual role activities due to emotional problems	43.6±5.8	47.8±4.1	0.661
Vital	43.5±4.1	48.8±4.9	0.99
Perceptions of general health.	51.1±5.6	49.6±3.3	0.11

Table 4: Evaluation of the general results of surgery according to the complications generated

Variable	Patients, 120	Control, 80	P-value
Fetal abnormalities n (p%)	3 (2.50)	0	<0.001
Hypertension n (p%)	7 (5.83)	4 (5)	0.83
Low birth weight baby n (p%)	2 (1.67)	---	<0.001
Hypocalcemia n (p%)	10 (8.33)	2 (2.5)	<0.001
Recurrent laryngeal nerve injury n (p%)	2 (1.6)	3 (3.7)	0.92

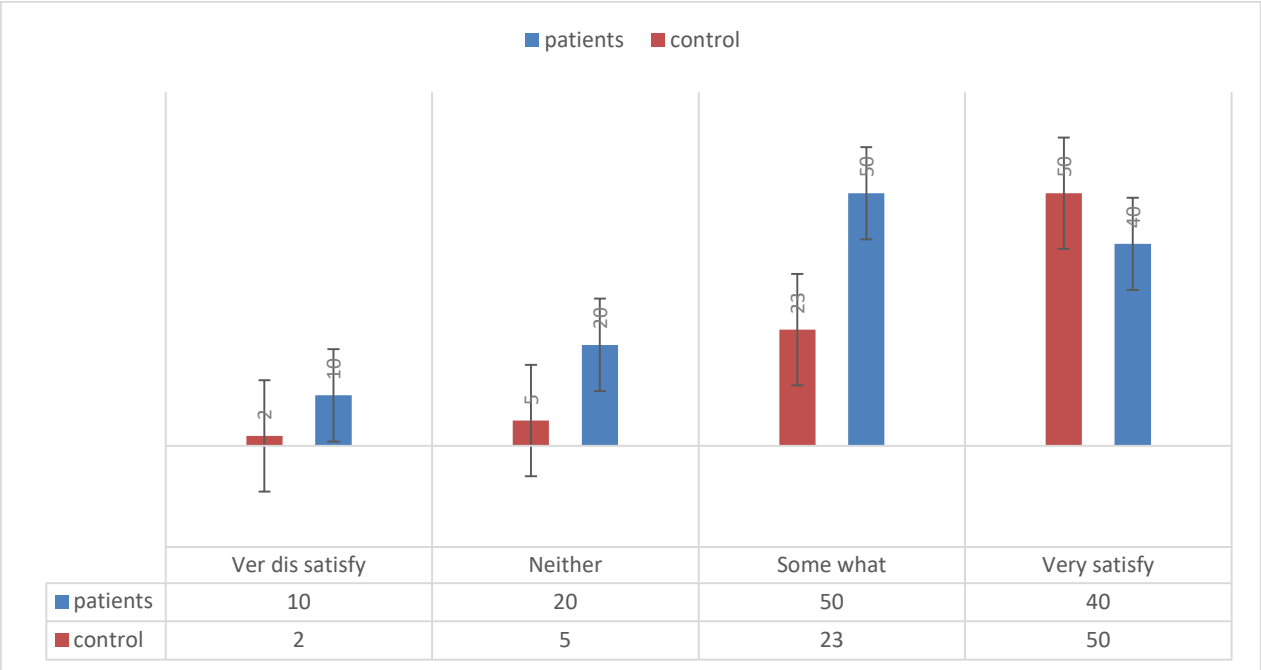

Fig 1: Evaluating the degree of patient satisfaction with the surgical procedure and the resulting complications.

Table 5: Evaluation of the general results postoperative according to sf 36

Variable	Patients, 120	Control, 80	P-value
Limitations in physical activities due to health problems	59.9 (6.3)	60.2 (7.5)	0.88
Limitations in social activities due to physical or emotional problems	55.2 (7.9)	61.1 (6.8)	0.087
Limitations in usual role activities due to physical health problems	66.9±5.9	70.1±1.9	0.05
Physical pain	55±3.8	60.8±7.2	0.02
General mental health (psychological distress and well-being)	61.3±9.2	61.3±5.5	0.09
Limitations in usual role activities due to emotional problems	55.3±5.8	56.8±6.1	0.64
Vital	66.8±4.1	70.2±3.1	0.64
Perceptions of general health.	60.8±6.8	66.9±4.9	0.22

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Table 6: Logistic regression to assess risk factors generated in this study on patients

Variable	CIO	P-value
Fetal abnormalities	0.9 (0.34-1.1)	0.928
Hypertension	1.2 (0.77-1.62)	0.66
Perceptions of general health.	1.32 (0.8-1.72)	0.72
Admission Urgent	1.34 (0.6-1.6)	0.55
Bleeding.	1.82 (1.24-2.73)	<0.001
Infection.	2.4 (1.66-3.11)	<0.001
Benign enlargement of the thyroid gland (goiter).	2.83 (2.4-3.9)	<0.001

DISCUSSION

thyroidectomy is one of the most common malignant tumors of the head, neck, and endocrine system in clinical practice, and the incidence rate is higher in young and middle-aged women. However, having thyroid cancer does not mean that life is about to end. 95% of thyroid cancers are differentiated with low malignancy. Patients do not need to be too nervous and can keep in a good mood and live optimistically. After standardized treatment, the life expectancy and quality of life of most patients are no different from those of normal people. Therefore, thyroid cancer is also called the "gentlest cancer." [Lee, M. C. *et al*., 2016]

Population-based studies have shown that incidental thyroid nodules are increasingly recognized. The rise in thyroid diagnostic procedures (such as fine-needle aspiration biopsy) has partly led to the increase in thyroid cancer diagnoses and increased thyroid surgery. Thyroid cancer in pregnant women in Iraq is the main area of increased diagnosis, but these patients have a good prognosis with a 5-year survival rate of 98% [Scott, A. R. *et al*., 2020; https://gis.cdc.gov, 2021]. In addition, the optimal treatment for differentiated thyroid cancer is also controversial because complications associated with thyroidectomy have a significant impact on patients' quality of life. This review highlights current controversies, including whether peripheral squamous cell carcinoma should be treated with active surveillance or surgery, the extent of surgery and lymph node dissection in low-risk direct thyroid cancer, and the use of molecular testing to guide decision-making. This review includes a discussion of direct-to-consumer clinical guidelines for new thyroidectomy techniques and focuses on patient preferences regarding decision-making and clinical outcomes after thyroidectomy. [Choi, Y. M. *et al*., 2014]

Mild to moderate iodine deficiency during pregnancy may have long-term adverse effects on fetal neurodevelopment. Since iodine is important for thyroid hormone synthesis, these effects are likely to be due to changes in maternal thyroid function. However, the effect of iodine intake on thyroid function and reference thyroid function values during pregnancy remains unclear. The aim of the study was to investigate the relationship between iodine intake and thyroid function during pregnancy. [Haugen, B. R. *et al*., 2016] The study included 2910 pregnant women and iodine intake was measured by questionnaire and urinary iodine concentration, and the relationship between iodine intake and plasma thyroid hormones and antibodies was studied. The results showed that mild to moderate iodine deficiency may affect thyroid function during pregnancy. The small differences suggest that it is also possible to determine normal reference values based on people with mild iodine deficiency, but this requires further research. In addition, iodine supplementation may temporarily inhibit the secretion and/or release of thyroid hormones [Hwangbo, Y. *et al*., 2017].

Pregnancy itself constitutes a condition under which functional and morphological alterations occur at the thyroid level. To begin, levels of estrogen rise markedly with the onset of pregnancy, leading to significant increases in thyroxine-binding protein (TBG) levels during the first trimester, whereby increased hepatic production and impaired metabolism are initiated. This causes a relative fall in the concentration of free thyroid hormone. On the other hand, there is a gradual physiological increase in levels of hCG from the placenta, with hCG peaking around week 10-12 of the pregnancy [Patel, J. *et al*., 2011]. hCG has an α subunit that is similar to that of TSH and binds to the TSH receptor in the thyroid. This stimulates the thyroid hormone synthesis and release, having the knock-on effect of suppressing TSH levels (maximum suppression occurs between weeks 8-14 of pregnancy) due to the feedback inhibition exerted by T4 and T3 at the level of hypophyseal and hypothalamic control. Finally, throughout the second and third trimesters, the metabolism of thyroid hormones surges because of

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the increased activity of placental iodine-initiated Type II and III enzymes. Metabolism takes a 40% hike during pregnancy, which continues progressively till weeks 16-20 of gestation [Pop, V. J. *et al*., 2003].

Hyperthyroidism during pregnancy is usually caused by Graves' disease and occurs in 1 to 4 of every 1,000 pregnancies in the United States. 1 Graves' disease is an autoimmune disorder. In this disease, the immune system produces antibodies that cause the thyroid gland to produce too much thyroid hormone. This antibody is called thyroid-stimulating immunoglobulin, or TSI. Graves' disease may first appear during pregnancy. However, symptoms may improve in the second and third trimesters. Parts of the immune system become less active as pregnancy progresses, so the immune system produces less TSI. This may be why symptoms improve. Graves' disease usually worsens again during the first few months after delivery, when TSI levels rise again. [Morreale de Escobar, G. *et al*., 2000]

Sociodemographic factors include a lot of content, especially gender, age, education level, region, etc. Summary of relevant studies at home and abroad indicates that gender has a significant influence on the quality of life after thyroid surgery, and there are significant differences in the recovery period and recurrence rate between the two groups (pregnant women and non-pregnant control group) ($P < 0.001$). [Yu, H. W. *et al*., 2020] Pregnant patients have a lower quality of life, according to the SF-36. Further investigation of the reason for this phenomenon may be due to the fact that female patients suffer more severe damage to their physical functions after surgery, feel more pain, and experience more obvious changes in their physical appearance, which causes them to experience greater stress, depression, and pessimism, which affects their recovery after surgery. [Al-Qahtani, K. H. *et al*., 2015] In terms of educational level, there was no significant difference in the recovery period after surgery and the recurrence rate between patients with different educational levels ($P > 0.100$). In terms of age, other studies have shown that the quality of life of non-pregnant patients after thyroidectomy is relatively higher than that of pregnant women after surgery, and there is a significant difference between the two ($P < 0.001$). [Promberger, R. *et al*., 2014] The reasons for this phenomenon are that pregnant women suffer from greater stress in life and a stronger fear of thyroid cancer, which leads to greater anxiety in daily life and affects their normal diet and sleep, which is not conducive to recovery after surgery. [Abdelhamid, A. *et al*., 2021]

CONCLUSION

In summary, following a thyroidectomy, patients should prioritise enhancing their quality of life, expediting recovery through "high-quality" living, minimising recovery time, and reducing recurrence rates and disease resistance. To achieve this objective, nutritional factors, socio-demographic factors, long-term medication, fatigue, psychological factors, and other relevant elements must be meticulously regulated, and effective interventions in the postoperative period must be implemented.

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