

# Evaluation of pregnancy outcomes after thyroid surgery

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**Abstract**— *Background: According to contemporary cancer data, women account for roughly 75% of differentiated thyroid carcinoma (DTC), with the largest incidence occurring in individuals aged 50-59 years in the United States. Objective: This paper aims to evaluate of pregnancy outcomes after thyroid surgery. Patients and methods: This paper was interested to analyse and evaluate of pregnancy outcomes after thyroid surgery by radioactive iodine therapy, which includes 42 cases of pregnant women which suffered of thyroid and processes of thyroid surgery were applied in different hospitals in Iraq from 15th March 2021 to 27th July 2022. This data collected were analysed and conducted all demographic characteristics by the SPSS program. Discussion: This paper was presented different outcomes of pregnant women patients where it presented that the women have overweight were more struggled than those underweight due to a goiter which causes an overweight. In addition, the outcomes of pregnancy outcomes after surgery were got low birth weight; baby were most of the risk factors that have a high influenced on the women after pregnancy, with where it covered 7.1% of women. Furthermore, in the evaluations of blood pressure measurements post-operative of pregnant women surgery where this study diastolic blood pressure of women measurements after surgery and during surgery which found 57.14% for women have a blood pressure of <80 mm Hg and 23.81 for women have 80-89 mm Hg as well as 19.05 for women have >90 mm Hg. Conclusion: In conclusion, this study indicates that there is uncontrolled hyperthyroidism in pregnant patients, which causes many effects. In addition, this study showed that thyroidectomy surgery was successful, but our study found that there is an increased risk in the case of premature delivery before radioactive iodine treatment. After thyroid surgery, radioactive iodine therapy may be required in some thyroid cancer instances. As of currently, this paper suggests women waiting at least six months before getting pregnant after receiving radioactive iodine therapy due to worries about potential radiation impacts on the unborn child's development..*

**Keywords** – *thyroid; hypertension; Overweight; and Surgical treatments.*



### I. INTRODUCTION

According to contemporary cancer data, women account for roughly 75% of differentiated thyroid carcinoma (DTC) [1], with the largest incidence occurring in individuals aged 50-59 years in the United States. DTC is one for the most prevalent malignancies affecting women between the ages of 15 and 39 [2], and recent research have revealed a rise in the prevalence of DTC in this cohort. The majority of DTCs have a favourable prognosis, having a five-year survival rate in greater than 98%. Despite the low death rate, recurrence is common. [3-6]

A 5- with 10-year recurrence incidence of 4.5% as well as 9.2%, respectively, was observed in Korean countrywide research covering patients with DTC less than 2 cm. A recent meta-analysis involving 31 trials on low-risk DTC found that the average pooled 10-year rate of recurrence remained at 9.0% in hemithyroidectomy patients and 7.4% in complete thyroidectomy patients. Furthermore, recurrence is more common in younger individuals, while their survival is seldom compromised. As a result, concerns about adverse health consequences associated with DTC therapy techniques, especially among younger patients, are growing. [7-13]

Thyroidectomy plus radioactive iodine therapy (RAIT) are the most common DTC therapies. After thyroidectomy, all patients who have total thyroidectomy, whereas more than half of those who have less-than-total thyroidectomy need thyroid hormone replacement treatment, and some have thyroid hormone suppression medication. As a result, the negative consequences with thyroid hormone over- as well as under-replacement following thyroidectomy might endure a lifetime. The significance of sufficient thyroid hormone state, particularly among pregnant women, has recently been highlighted in relation to pregnancy outcomes [14-17]. This paper aims to evaluate of pregnancy outcomes after thyroid surgery.

### II. MATERIAL AND METHOD

This paper was interested to analyse and evaluate of pregnancy outcomes after thyroid surgery which include 42 cases of pregnant women which suffered of thyroid and processes of thyroid surgery were applied in different hospitals in Iraq from 15th March

2021 to 27th July 2022. This data collected were analysed and conducted all demographic characteristics by the SPSS program.

This study was distributed of demographic characteristics with pregnancy outcomes based on age, BMI, which get within <31.44 and >31.44, symptoms where include Constipation, Feeling tired, Skin and hair changes, Swelling of the face, and Weight gain as well as contain comorbidities where have Asthma Diabetes Gastrointestinal disease, Heart disease, Hypertension, and Renal disease where these results can be seen in Table 1, Table 2, Table 3, and Table 4.

To further of outcomes, this study was determined pregnancy outcomes after surgery that include congestive heart failure, fetal abnormalities, hypertension, increased abortion rate, low birth weight baby, neonatal death, premature labor, and thyroid storm with labor, which can be resulted in Table 5. This paper was evaluated of blood pressure measurements post-operative of pregnant women surgery, which include <80 mm Hg, 80-89 mm Hg, and >90 mm Hg. That these outcomes were found in Figure 2; finally, this study was extended to the assessment of risk factors impacted to pregnant women after surgery which contain the Nervous system, Eye, ear, face and neck, Circulatory system, Respiratory system, digestive system, Genital organs, Urinary system, and other malformation were settled in Figure 3.

### III. RESULTS

Table 1: Distributions of demographic characteristics with pregnancy outcomes based on age.

N	V	42
	Mi	0
M		35.0000
StEM		.94568
Me		35.0000
Mo		25.00 <sup>a</sup>
SD		6.12870
Var		37.561
Sk		.000
SES		.365

R	20.00
Min	25.00
Max	45.00
S	1470.00

Table 2: Distributions of demographic characteristics with pregnancy outcomes based on BMI.

		F, (42)	P (%)	VP (%)	CP (%)
V	<31.44	13	31.0	31.0	31.0
	>31.44	29	69.0	69.0	100.0
	T	42	100.0	100.0	

Table 3: Distributions of demographic characteristics with pregnancy outcomes based on symptoms.

		F, (42)	P (%)	VP (%)	CP (%)
V	Constipation	5	11.9	11.9	11.9
	Feeling tired.	6	14.3	14.3	26.2
	Skin and hair changes	6	14.3	14.3	40.5
	Swelling of the face	4	9.5	9.5	50.0
	Weight gain	21	50.0	50.0	100.0
	T	42	100.0	100.0	

Table 4: Distributions of demographic characteristics with pregnancy outcomes based on comorbidities.

		F, (42)	P (%)	VP (%)	CP (%)
V	Asthma	4	9.5	9.5	9.5
	Diabetes	7	16.7	16.7	26.2
	Gastrointestinal disease	2	4.8	4.8	31.0
	Heart disease	5	11.9	11.9	42.9
	Hypertension	18	42.9	42.9	85.7
	Renal disease	6	14.3	14.3	100.0
	T	42	100.0	100.0	

Table 5: Pregnancy outcomes after radioactive iodine therapy surgery.

		F, (42)	P (%)	VP (%)	CP (%)	P (%)	VP (%)
Valid	congestive heart failure	2	4.8	4.8	4.8		
	fetal abnormalities	2	4.8	4.8	9.5		
	hypertension	4	9.5	9.5	19.0		
	increased abortion rate	2	4.8	4.8	23.8		
	low birth weight baby	3	7.1	7.1	31.0		
	neonatal death	1	2.4	2.4	33.3		
	Non	26	61.9	61.9	95.2		

	premature labor	1	2.4	2.4	97.6
	thyroid storm with labor	1	2.4	2.4	100.0
	Total	42	100.0	100.0	

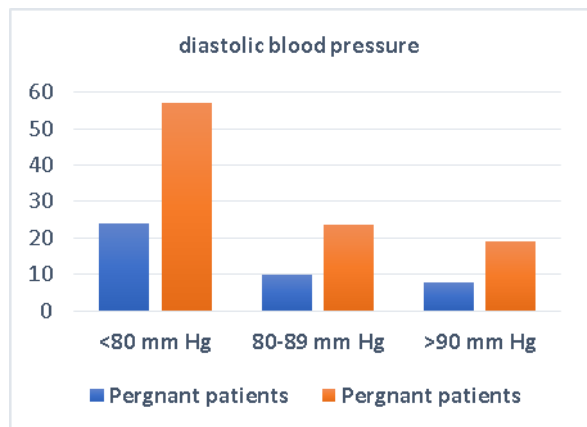


Fig.1: Evaluations of blood pressure measurements post-operative of pregnant women during radioactive iodine therapy surgery.

Table 6- Assessment of risk factors impacted to pregnant women after radioactive iodine therapy surgery.

Pregnancy outcomes	F,n (42)	Per(%)
Nervous system	9	21.43
Eye, ear, face and neck	2	4.76
Circulatory system	4	9.52
Respiratory system	2	4.76
digestive system	11	26.19
Genital organs	7	16.67
Urinary system	3	7.14
Other malformation	4	9.52

#### IV. DISCUSSION

This paper was presented different outcomes of pregnant women patients where it presented that the women have overweight were more struggled than those underweight due to a goiter which causes an overweight. As well as our results found that almost of patients have Weight gain, with 50 % lead to impact on the women during surgery. In this study, the thyroid surgery used general anaesthesia because of the quality of this type during surgeries. [18]

This paper noticed that 42.9 % of women have high hypertension due to depression preoperative of the thyroid. The outcome of pregnancy outcomes after surgery were got a low-birth-weight baby. Were most of the risk factors have a high influenced on women after pregnancy with, where it covered 7.1% of women.

In the evaluations of blood pressure measurements post-operative of pregnant women surgery where this study diastolic blood pressure of women measurements after surgery and during surgery which found 57.14% for women have a blood pressure of <80 mm Hg and 23.81 for women have 80-89 mm Hg as well as 19.05 for women have >90 mm Hg. This paper assessed the risk factors of pregnant women, where it appeared digestive system have 26.19% and the Nervous system have 21.43%, as well as Genital organs got impacted with 16.67% on women.

Following thyroidectomy and radioactive iodine therapy, women are recommended to wait 6-12 months before getting pregnant out of worry for potential radiation effects on an unborn child. Although there was no increased risk of abortion, early delivery, or birth abnormalities if pregnancy occurred at least six months after receiving radioactive iodine therapy [19,20]. Moreover, pregnancies that took place within six months of receiving radioactive iodine therapy were the only ones that were associated with an increased risk of birth abnormalities. Whenever pregnancy happened more than 24 months following radioactive iodine therapy surgery, there was an elevated chance of preterm delivery.

#### V. CONCLUSION

In conclusion, this study indicates that there is uncontrolled hyperthyroidism in pregnant patients, which causes many effects. In addition, this study showed that thyroidectomy surgery was successful, but our study found that there is an increased risk in the case of premature delivery before radioactive

iodine treatment. After thyroid surgery, radioactive iodine therapy may be required in some thyroid cancer instances. As of currently, this paper suggests women waiting at least six months before getting pregnant after receiving radioactive iodine therapy due to worries about potential radiation impacts on the unborn child's development.

## REFERENCES

- [1] Haugen BR, Alexander EK, Bible KC, et al. 2015 American Thyroid Association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: the American Thyroid Association Guidelines Task Force on thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2016;26 (1):1-133.
- [2] Wu JX, Young S, Ro K, et al. Reproductive outcomes and nononcologic complications after radioactive iodine ablation for well-differentiated thyroid cancer. *Thyroid*. 2015;25 (1):133-138.
- [3] Sawka AM, Lakra DC, Lea J, et al. A systematic review examining the effects of therapeutic radioactive iodine on ovarian function and future pregnancy in female thyroid cancer survivors. *Clin Endocrinol (Oxf)*. 2008;69 (3):479-490.
- [4] Sawka AM, Lea J, Alshehri B, et al. A systematic review of the gonadal effects of therapeutic radioactive iodine in male thyroid cancer survivors. *Clin Endocrinol (Oxf)*. 2008;68 (4):610-617.
- [5] Alexander EK, Pearce EN, Brent GA, et al. 2017 guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and postpartum. *Thyroid*. 2017;27 (3):315-389.
- [6] Luster M, Clarke SE, Dietlein M, et al.; European Association of Nuclear Medicine (EANM). Guidelines for radioiodine therapy of differentiated thyroid cancer. *Eur J Nucl Med Mol Imaging*. 2008; 35 (10):1941-1959.
- [7] World Medical Association. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. *JAMA*. 2013;310 (20):2191-2194.
- [8] Seo GH, Cho YY, Chung JH, Kim SW. Increased risk of leukemia after radioactive iodine therapy in patients with thyroid cancer: a nationwide, population-based study in Korea. *Thyroid*. 2015;25 (8):927-934. doi:10.1089/thy.2014.0557
- [9] Molenaar RJ, Sidana S, Radivoyevitch T, et al. Risk of hematologic malignancies after radioiodine treatment of well-differentiated thyroid cancer. *J Clin Oncol*. 2018;36 (18):1831-1839.
- [10] Rubino C, de Vathaire F, Dottorini ME, et al. Second primary malignancies in thyroid cancer patients. *Br J Cancer*. 2003;89 (9):1638-1644.
- [11] Subramanian S, Goldstein DP, Parlea L, et al. Second primary malignancy risk in thyroid cancer survivors: a systematic review and meta-analysis. *Thyroid*. 2007;17 (12):1277-1288.
- [12] Sawka AM, Thabane L, Parlea L, et al. Second primary malignancy risk after radioactive iodine treatment for thyroid cancer: a systematic review and meta-analysis. *Thyroid*. 2009;19 (5):451-457.
- [13] Vini L, Hyer S, Al-Saadi A, Pratt B, Harmer C. Prognosis for fertility and ovarian function after treatment with radioiodine for thyroid cancer. *Postgrad Med J*. 2002;78 (916):92-93.
- [14] do Rosario PW, Barroso AL, Rezende LL, Padrao EL, Borges MA, Purisch S. Malformations in the offspring of women with thyroid cancer treated with radioiodine for the ablation of thyroid remnants. *Arq Bras Endocrinol Metabol*. 2006;50 (5):930-933.
- [15] Dottorini ME, Lomuscio G, Mazzucchelli L, Vignati A, Colombo L. Assessment of female fertility and carcinogenesis after iodine-131 therapy for differentiated thyroid carcinoma. *J Nucl Med*. 1995; 36 (1):21-27.
- [16] Schlumberger M, De Vathaire F, Ceccarelli C, et al. Exposure to radioactive iodine-131 for scintigraphy or therapy does not preclude pregnancy in thyroid cancer patients. *J Nucl Med*. 1996;37 (4):606-612.
- [17] Chow SM, Yau S, Lee SH, Leung WM, Law SC. Pregnancy outcome after diagnosis of differentiated thyroid carcinoma: no deleterious effect after radioactive iodine treatment. *Int J Radiat Oncol Biol Phys*. 2004;59 (4):992-1000.
- [18] Brandao CD, Miranda AE, Correa ND, Sieiro Netto L, Corbo R, Vaisman M. Radioiodine therapy and subsequent pregnancy. *Arq Bras Endocrinol Metabol*. 2007;51 (4):534-540.
- [19] Bal C, Kumar A, Tripathi M, et al. High-dose radioiodine treatment for differentiated thyroid carcinoma is not associated with a change in female fertility or any genetic risk to the offspring. *Int J Radiat Oncol Biol Phys*. 2005;63 (2):449-455.
- [20] Garsi JP, Schlumberger M, Rubino C, et al. Therapeutic administration of 131I for differentiated thyroid cancer: radiation dose to ovaries and outcome of pregnancies. *J Nucl Med*. 2008;49 (5): 845-852.