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Thyroiditis as A Risk Factor for Post Operative Complications in Patients Undergoing Total Thyroidectomy: A Retrospective Study

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Abstract

Background: Thyroiditis may be difficult to differentiate from thyroid malignancy as the two conditions may coexist. Patients with thyroiditis generally undergo medical management. Suspicion of neoplasm or neoplastic degeneration are indications for Thyroidectomy. Thyroidectomy in patients with thyroiditis is associated with danger due to peri-glandular dense inflammatory process which can cause difficulty in surgical resection and probably increases the postoperative complications.

Objectives

1. To determine the incidence of Thyroiditis.
2. To compare postoperative complications in patients with thyroiditis and non-thyroiditis.

Methods and Material: A retrospective record review of all patients who underwent Thyroidectomy from January 2021 to December 2024 in Sapthagiri Institute of Medical Sciences and Research Center, was done. Patients were identified using a computer-generated search through the medical records department.

Statistical Analysis used: The Statistical software namely SPSS 22.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

Results: Patients with Thyroiditis significantly belonged to middle age group and more likely to be female. There

was no significant difference between the two groups in the rate of malignancy. However, patients undergoing total thyroidectomy with Thyroiditis had a significantly higher postoperative complication rate.

Conclusion: Patients with Thyroiditis had a higher rate of complications when compared to patients with non-thyroiditis.

Keywords: Hypocalcemia, Hoarseness of voice, Thyroid.

Introduction

The thyroid gland with its fibrous capsule, high iodide content, extensive blood & lymphatic supply, makes the gland inherently resistant to infection[1]. Thyroiditis is an organ–specific autoimmune disease characterized by production of antibodies such as anti-thyroperoxidase (TPO), which leads to destruction of the thyroid gland and a decrease in normal thyroid function[2-4]. Thyroiditis may be difficult to differentiate from thyroid malignancy as the two conditions may coexist[5]. Patients with thyroiditis generally undergo medical management[6]. Suspicion of neoplasm or neoplastic degeneration are indications for Thyroidectomy[7]. Thyroidectomy in patients with thyroiditis is associated with danger due to periglandular dense inflammatory process which can cause difficulty in surgical resection and probably increases the postoperative complications[6]. In this study we have analyzed the incidence of thyroiditis and post-operative hypocalcemia and transient hoarseness of voice in patients who underwent Total thyroidectomy at our institute.

Materials & Methods

A retrospective record review of 100 patients who underwent Thyroidectomy from January 2021 to December 2024 at Sapthagiri Institute of Medical Sciences and Research Center, was done. Patients were identified using a computer-generated search through the medical records department. The collected clinical data included Age, Gender, Histopathological analysis of thyroid tissue and the post-surgical complications were evaluated.

Statistics Analysis

Statistical Methods: Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance.

The following assumptions on data is made, **Assumptions: 1.** Dependent variables should be normally distributed, 2. Samples drawn from the population should be random, Cases of the samples should be independent

Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups (Inter group analysis) on metric parameters. Leven`s test for homogeneity of variance has been performed to assess the homogeneity of variance. A t-test is a statistical test that is used to compare the means of two groups. It is often used in hypothesis testing to determine whether a process or treatment actually has an effect on the population of interest, or whether two groups are different from one another with the null hypothesis (H_0) is that the true difference between these group means is zero and the alternate hypothesis (Ha) is that the true difference is different from zero.

Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, non-parametric setting for

Qualitative data analysis. Fisher Exact test used when cell samples are very small. Significant figures

+ Suggestive significance (P value: 0.05<P<0.10)

* Moderately significant (P value: 0.01<P ≤ 0.05)

** Strongly significant (P value: P≤0.01)

Statistical software: The Statistical software namely SPSS 22.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc**.**

Results:

Study Design: A Retrospective study to determine the incidence of thyroiditis in patients who underwent total thyroidectomy.

Age in Years	No. of Patients	%
<20	4	4.0%
20-30	16	16.0
31-40	26	26.0
>40	54	54.0
Total	100	100.0

Mean +SD = 41.37±13.81

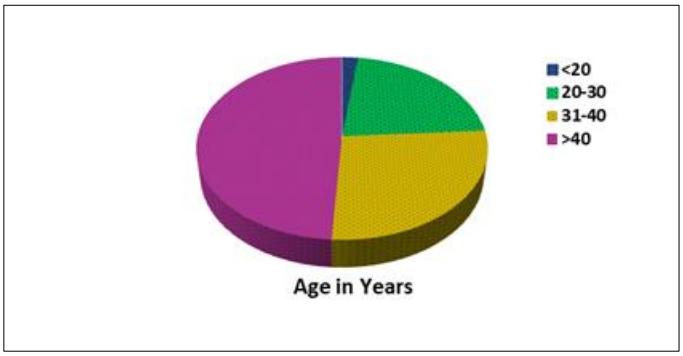


Table / Figure 1: Age in Years- frequency distribution of patients studied

Gender	No. of Patients	%
Female	77	77.0
Male	23	23.0
Total	100	100.0

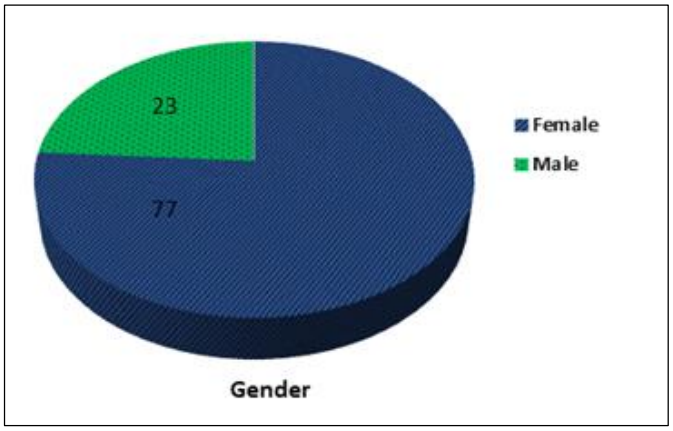
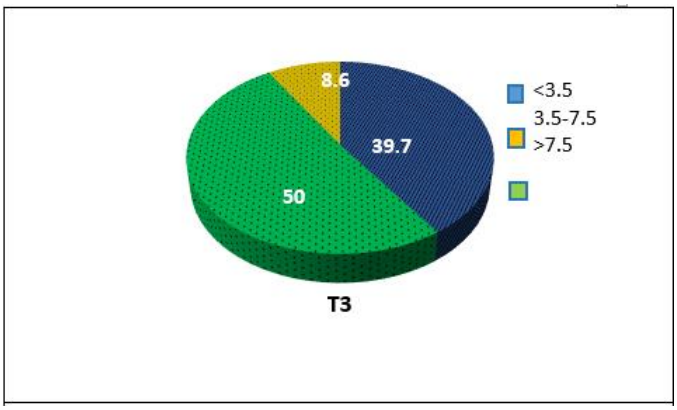


Table / Figure 2: Gender- frequency distribution of patients studied

Variables	No. of Patients	%
T3 (umol/L)		
<3.5	23	39.7
3.5-7.5	29	50.0
>7.5	5	8.6
Total	58	100.0
T4 (nmol/L)		
<10	1	1.7
10-30	57	98.3
>30	0	0.0
Total	58	100.0
TSH (0.3-3.3mU/L)		
<0.3	4	6.6
0.3-3.3	46	75.4
>3.3	11	18.0
Total	61	100.0



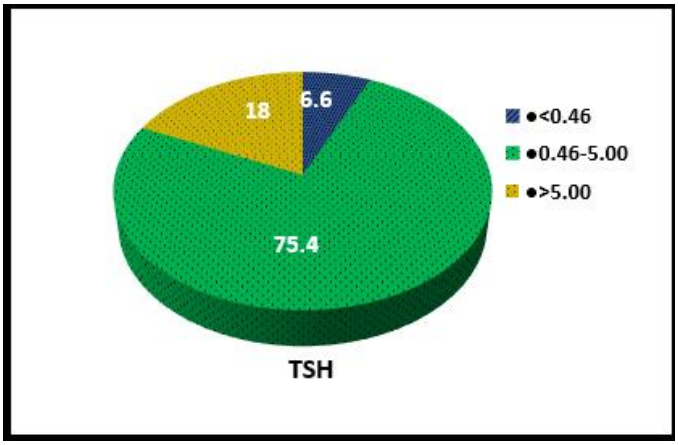


Table / Figure 3: thyroid profile - frequency distribution of patients studied

HPE	No. of Patients (n=100)	%
MNG	49	49%
NODULAR COLLOID GOITRE	13	13%
ADENOMATOUS NODULES	3	3%
FOLLICULAR ADENOMA	6	6%
HURHTLE CELL ADENOMA	1	1%
AMYLOID GOITRE	1	1%
COLLOID	4	4%
GOITRE WITH CYSTIC CHANGES		
FOLLICULAR CARCINOMA	3	3%
PAPILLARY CARCINOMA	4	4%
LYMPHOCYTIC THYROIDITIS	3	3%
HASHIMOTO THYROIDITIS	13	13%

Table 4: HPE-frequency distribution of patients studied

Sr Ca	No. of Patients	%
<8.9	68	68.7
8.9-10.3	32	31.3
>10.3	0	0.0
Total	100	100.0

Mean ± SD: 8.35±0.83

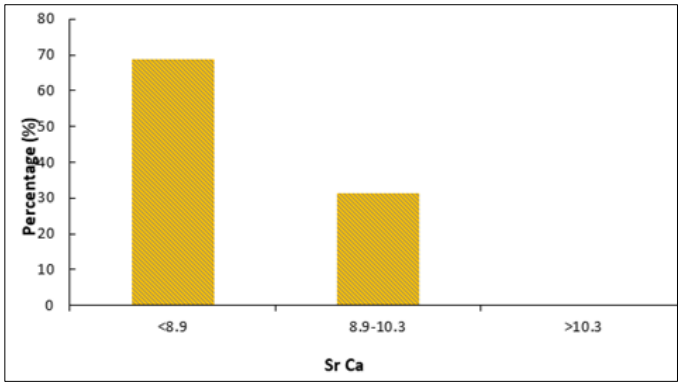


Table / Figure 5: Sr Ca- frequency distribution of patients studied

Hypocalcemia	No. of Patients	%
Absent	66	66.0
Present	34	34.0
Total	100	100.0

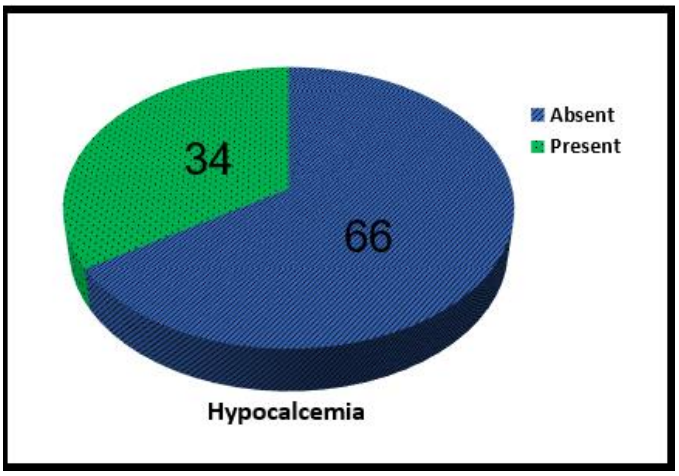
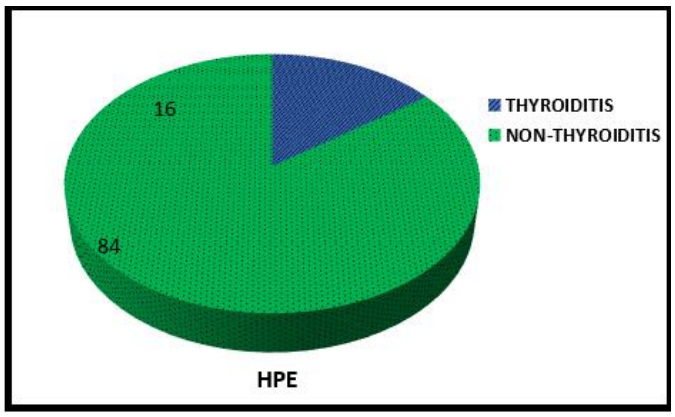


Table / Figure 6: Hypocalcemia- frequency distribution of patients studied

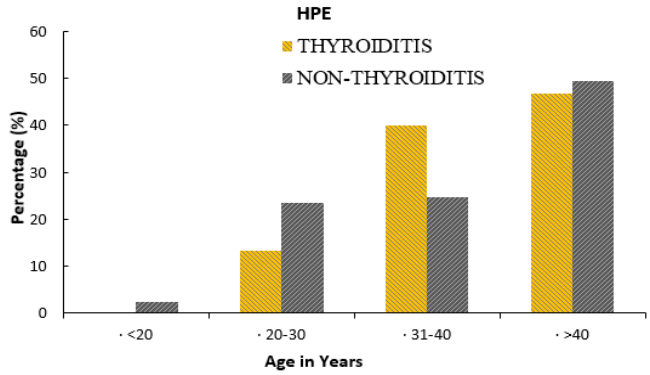
HPE	No. of Patients	%
Thyroiditis	16	16.0
Non-Thyroiditis	84	84.0
Total	100	100.0



Table/ Figure 7: HPE- Frequency Distribution of Patients Studied

Variables	HPE		Total	P Value
	Thyroiditis	Non-Thyroiditis		
Age in Years				
<20	0(0%)	2(2.4%)	2(2%)	0.592
20-30	2(13.3%)	20(23.5%)	22(22%)	
31-40	6(40%)	21(24.7%)	27(27%)	
>40	7(46.7%)	42(49.4%)	49(49%)	
Gender				
Female	16 (100%)	60(71.8%)	76(76%)	0.018*
Male	0(0%)	24(28.2%)	24(24%)	
Total	15(100%)	85(100%)	100(100%)	

Chi-Square Test/Fisher Exact Test



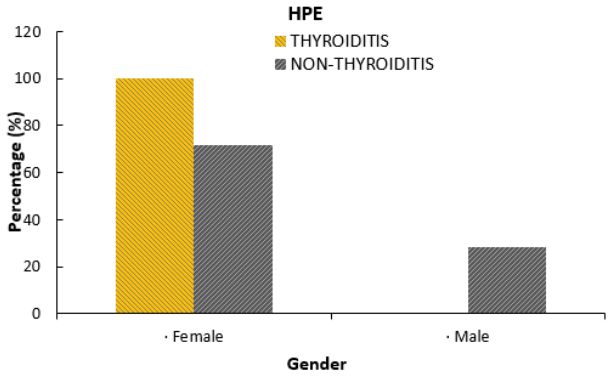


Table / Figure 8: Comparison of Clinical Variables in Relation to HPE of Patients Studied

Sr Ca	HPE		Total
	Thyroiditis	Non-Thyroiditis	
<8.9	15(93.3%)	53(64.3%)	68(68.7%)
8.9-10.3	1(6.7%)	30(35.7%)	31(31.3%)
>10.3	0(0%)	0(0%)	0(0%)
Total	16(100%)	83(100%)	99(100%)

P=0.032*, Significant, Fisher Exact Test

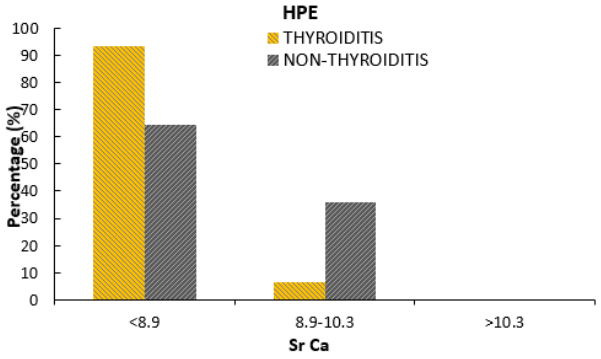


Table / Figure 9: Comparison of Serum Calcium In Relation To HPE Of Patients Studied.

HOARSNESS	No. of Patients	%
Absent	96	96.0
Present	4	4.0
Total	100	100.0

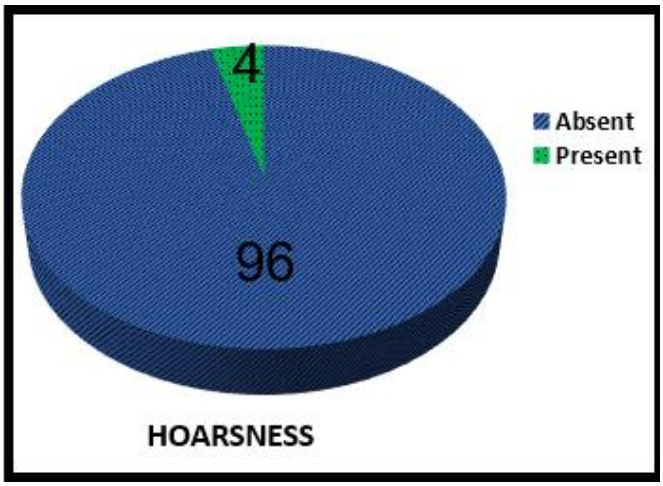


Table / Figure 10: Incidence of Hoarsness of Patients Studied

Variables	HPE		Total
	Thyroiditis	Non-Thyroiditis	
Absent	13 (93.3%)	84(96.5%)	96(96%)
Present	3(6.7%)	1(3.5%)	4(4%)
Total	16 (100%)	85(100%)	100(100%)

P=1.000, Not Significant, Fisher Exact Test

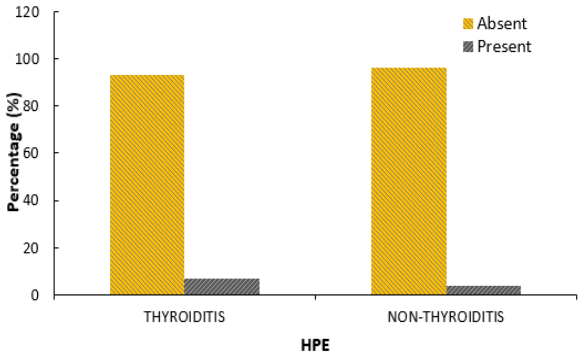


Table / Figure 11: Association of Hoarsness with HPE of Patients Studied

Gender	HOARSNESS		Total
	Absent	Present	
Female	72(75%)	4(100%)	76(76%)
Male	24(25%)	0(0%)	24(24%)
Total	96(100%)	4(100%)	100(100%)

P=0.569, Not Significant, Fisher Exact Test

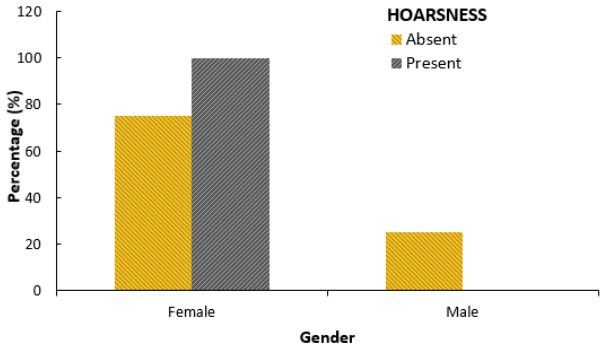


Table / Figure 12: Association of gender with incidence of hoarseness patients studied

Discussion

Treatment for patients with Thyroiditis varies depending on the symptoms with which the patient presents to the surgical department. Thyroidectomy in patients with thyroiditis is often recommended for individuals if there is a suspicion of malignancy, or if they have pain and compressive symptoms from an expanding goiter that does not respond to suppression medication[7].

In our study the mean age of patients was 41.37 + 5.3 with the maximum patients belonging to the middle age group (40 years), however in a study conducted by Beobachutungen K et al in which they analysed 1154 patients with thyroiditis with a mean age of patients being 46.32 + 4.2[3].

In our study, the females to male ratio was (3:1), similar to a study conducted by K Mahalakshmi which showed an increased occurrence between 21-40 years age group, mostly affecting the female population[8].

All our patients who underwent total thyroidectomy were assessed for their post operative complications. However Shimizu, et al reported that subtotal thyroidectomy was the safest procedure for patients with thyroiditis[7,9].

The most common complications associated with total thyroidectomy are hypocalcemia and RLN palsy, which can occur transiently or permanently as a result of trauma or disruption of the blood supply to the parathyroid glands and injury to RLN during dissection[10].

Our study reported an incidence rate of 15.1% with transient hypocalcaemia. The incidence of transient hypocalcemia by Shih et al. in their retrospective study of 474 cases of thyroiditis was found to be 32.1%[6] while that by Krishnan ravikumar et al in was reported as 39.7 % [10].

Shih et al. in their study reported 0.4% of transient RLN palsy in thyroiditis cases. (Shih et al) while study conducted by György et al. reported an incidence of 6.7 %[7]. Krishnan ravikumar et al on the other hand reported a 9.55% incidence [10]. In our Study we reported a rate of 6.7 % of transient RLN palsy in thyroiditis cases.

McManus et al[7] study reported a higher rate of postoperative complications (12.4%) compared to patients without Thyroiditis (5.74%). Krishnan Ravikumar, et al and McManus et al. have reported similar results regarding high temporary hypocalcemia, and transient RLN palsy in thyroiditis cases[7,10]. Similarly, our study had a higher rate of postoperative complications (15.1%) compared to patients without thyroiditis in the form of transient hypocalcemia.

Conclusion And Summary

Patients with thyroiditis have higher rate of complications due to dense adhesions and thickened fibrous capsule as a result of chronic inflammation. Most of the studies have reported a higher rate complication rate as compared to that performed for other benign conditions.

Therefore, it is necessary for surgeons and healthcare providers to consider the presence of thyroiditis, especially Hashimoto's thyroiditis, as a pivotal factor in planning and executing thyroidectomy procedures, as well as in the postoperative care of patients.

Given these insights, there is a clear need for further research to explore these dynamics in greater depth, aiming to enhance surgical planning, improve patient outcomes, and reduce complications.

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