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Incidence of Immediate Post-Operative Complications after Total Thyroidectomy in a Tertiary Government Hospital in Semi-urban and Rural South India - An Observational Study

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Abstract
Thyroidectomy is one of the most common surgeries performed. Like with any surgical procedure, surgical resection of the thyroid has complications - They maybe early or late post-operative complications. From October 2020 to September 2021, we collected data to understand the incidence of early complications following thyroidectomy in a tertiary care Government Hospital in Tamil Nadu, South India. A total of 100 patients were selected for the study using consecutive sampling. Informed consent was obtained. All data was collected and entered in Microsoft Excel. The data was analysed using IBM SPSS v23. Frequencies and percentage analysis was done. The mean age of the participants is 52.45 years with standard deviation of 14.8 years. There were 94 females and six males. Out of 100 participants, 83% had multi nodular goitre and 17% had colloid goitre as proved by FNAC. All of them had total thyroidectomy done. Out of 100 patients, 29 of them had diabetes, 23 of them had hypertension and 24 of them had respiratory disease. Out of 100 patients, 46 of them had hypocalcaemia, 12 of them had hoarseness of voice, four of them had wound infection and six of them had hematoma. In this study, hypocalcaemia was seen mainly during the first or second days after surgery. Most of these are cases of transient hypocalcaemia that responded well to treatment. Serial calcium measurement was done to find the initiation and the evolution of the condition.

Keywords: *Total thyroidectomy, Hypocalcaemia, Cross-sectional study, Post-operative complications, South India*

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I. Introduction

One of the most common endocrine disorders, thyroid enlargement is seen commonly in the surgical clinics[1]. In some of these cases, surgical resection is the only potential treatment. Complete surgical removal of the thyroid gland called thyroidectomy. It is the recommended treatment for large symptomatic goitres and in malignancy of the thyroid gland[2]. However, surgical resection of the thyroid has early and late post-operative complications. Studies report the following complications; wound infection, hematoma, recurrent laryngeal nerve injury, hypocalcaemia and Horner's syndrome[3-5].

The most important post-operative complication causing severe symptoms and increase the time of hospitalization is hypocalcaemia[6,7]. The underlying reason for this is the injury to the parathyroid glands due to accidental injury, devascularisation or removal. Injury to the recurrent laryngeal nerve presents as the hoarseness of voice and laryngeal dysfunction[8].

The post-operative complications affect the outcomes as well as the quality of life of the patient. It increases the need for lifelong therapy[9]. The incidence of complications depends on the extent of disease, type of disease, surgical removal approach used, surgeon's skills and experience[10-13]. Studies show that surgeon's experience is negatively correlated with the incidence of complications[14].

II. Materials and Methods

From October 2020 to September 2021, we did an observational study to understand the incidence of early complications following thyroidectomy in Government Mohan Kumaramangalam Medical College Hospital - a tertiary care centre in Tamil Nadu, South India. A total of 100 patients were selected for the study using consecutive sampling. Informed consent was obtained. Patients with MNG and Diffuse Colloid goitre over the age of 30 proven by USG and FNAC were selected. Those with thyroid malignancy were excluded from the study. A structured questionnaire was designed to collect the basic demographic details, comorbid conditions, type of surgery done and the early post- operative complications. Preoperative baseline calcium

levels and serial post operative calcium level monitoring was done. Normal total serum calcium is between 8 mg/dl and 11 mg/dl. Anything less than 8 mg/dl corrected for albumin concentration is considered hypocalcaemia. Preoperative vocal cord assessment using Indirect laryngoscopy (IDL) was done in all patients. Any postoperative change in voice quality was considered as hoarseness and was assessed subjectively. IDL for vocal cord palsy was done in selected doubtful cases. Presence of wound infection and hematoma was done by clinical examination. All data was collected and entered in Microsoft Excel. The data was analysed using IBM SPSS v23. Frequencies and percentage analysis was done.

III. Results

The mean age of the participants is 52.45 years with standard deviation of 14.8 years. The minimum age is 31 years and maximum age is 80 years. Table 1 and figure 1 shows the age distribution of the participants. There were 94 males and six females. Out of 100 participants, 83% had multi nodular goitre and 17% had colloid goitre. Table 2 and figure 2 show the diagnosis of the participants. All of them had total thyroidectomy done. Out of 100 patients, 29 of them had diabetes, 23 of them had hypertension and 24 of them had respiratory disease. Table 3 and Figure 3 show the comorbidities of the patients. Out of 100 patients, 46 of them had hypocalcaemia, 12 of them had hoarseness of voice, four of them had wound infection and six of them had hematoma. Table 4 and figure 4 show the complications of the patients. Out of the four who had wound infection, all of them were diabetics. Out of 12 patients who presented with hoarseness of voice, ten of them had pre-operative respiratory illness. Out of six patients who had hematoma, three of them were hypertensive and one of them was diabetic.

S.No	Parameter	Age in years
1	Mean	52.450
2	Median	51.500
3	Std. Deviation	14.7938
4	Minimum	31.0
5	Maximum	80.0

Table 1: Age distribution of the participants

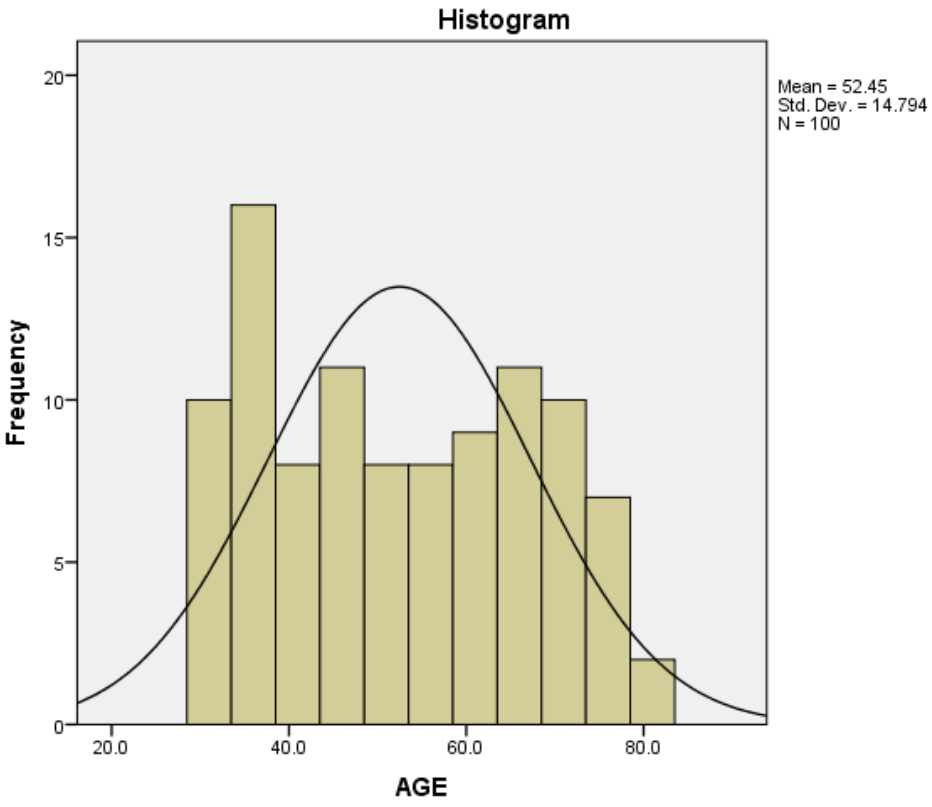

Figure 1: Age distribution of the participants

S.No	Diagnosis	Frequency	Percentage
1	Colloid Goitre	17	17.0
2	Multi Nodular Goitre	83	83.0
	Total	100	100

Table 2: Diagnosis of the participants

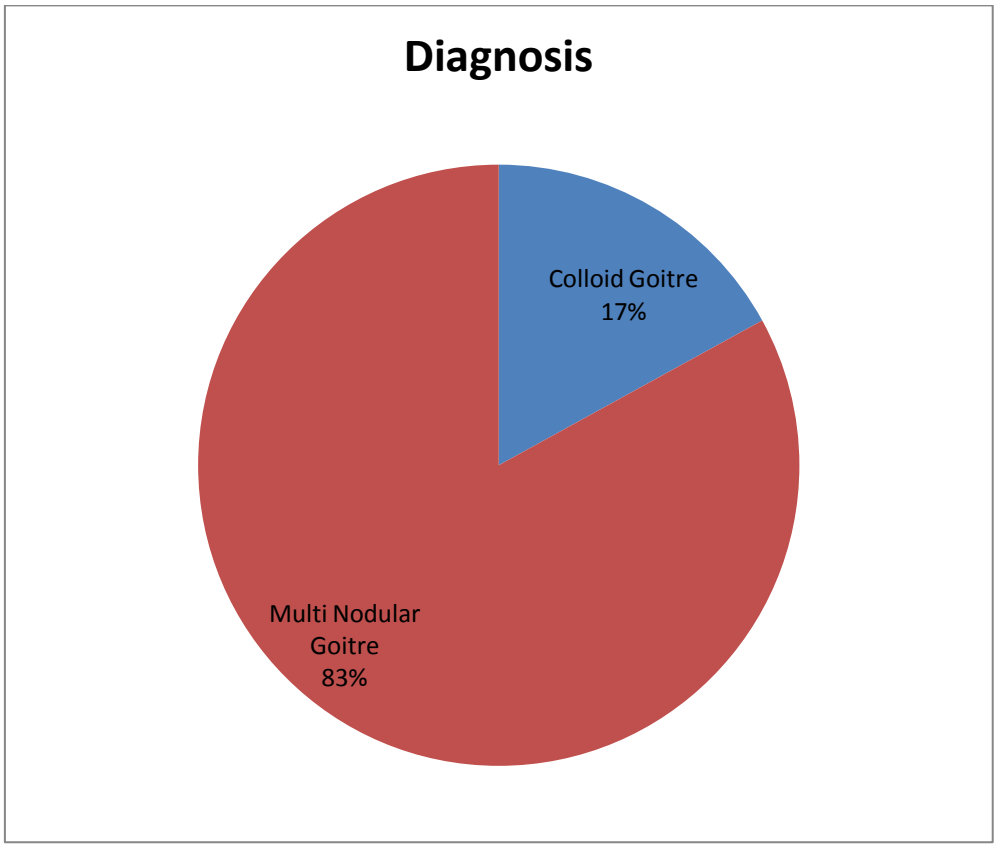

Figure 2: Diagnosis of the participants

S.No	Comorbidities	Frequency	Percentage
1	Diabetes	29	29
2	Hypertension	23	23
3	Respiratory Disease	24	24

Table 3: Comorbidities of the patients

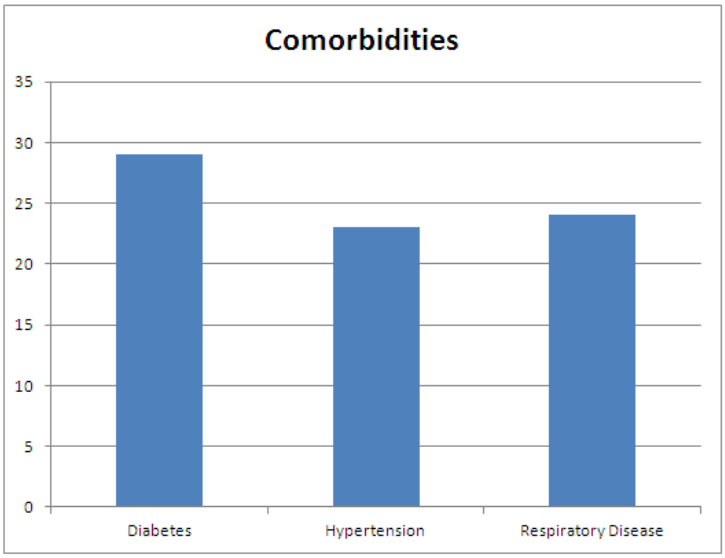

Figure 3: Comorbidities of the patients

S.No	Complications Present	Frequency	Percentage
1	Hypocalcaemia	46	46
2	Hematoma	6	6
3	Hoarseness of voice	12	12
4	Wound infection	4	4

Table 4: Complications of the patients

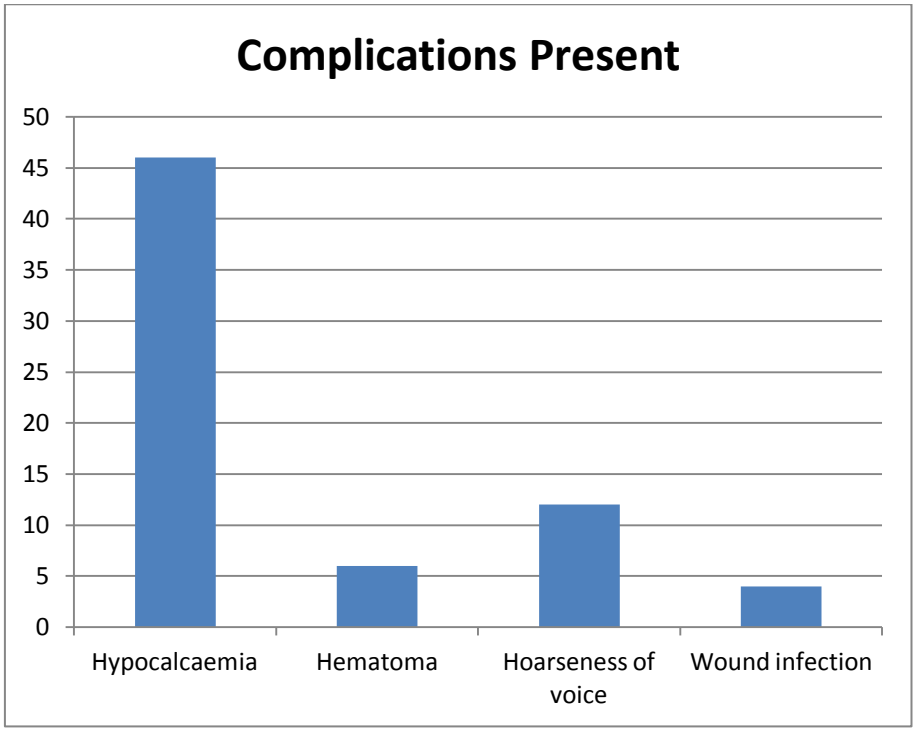

Figure 4: Complications of the patients

IV. Discussion

In our study, there were 94 females and six males and all of them underwent total thyroidectomy. Most of the studies report higher number of cases among females. Yan et al and Huang et al reported that majority of the cases are females[15,16]. Higher prevalence of thyroid disorders among women has been reported in epidemiological studies[17]. The mean age of the participants is 52.45 years with standard deviation of 14.8 years. The minimum age is 31 years and maximum age is 80 years. Out of 100 participants, 83% had multi nodular goitre and 17% had colloid goitre. All of them had total thyroidectomy done. Out of 100 patients, 29 of them had diabetes, 23 of them had hypertension and 24 of them had respiratory disease. Age distribution and type of surgery done is similar to the academic literature[15-17].

Out of 100 patients, 46 of them had hypocalcaemia, 12 of them had hoarseness of voice, four of them had wound infection and six of them had hematoma. Out of the four who had wound infection, all of them were diabetics. Out of 12 patients who presented with hoarseness of voice, ten of them had preoperative respiratory illness. Out of six patients who had hematoma, three of them were hypertensive and one of them was diabetic.

A study by Suwannasarn et al showed immediate hypocalcaemia in 38.5% of the patients while a study by Seo et al reported around 42%[19,20]. In our study, the results were comparative to that of those in literature. The hypocalcaemia can be attributed to the injury to the parathyroid during surgery.

In this study, hypocalcaemia was seen mainly during the first or second days after surgery. These are cases of transient hypocalcaemia that responded well to treatment. If the condition did not return to normal in three months, it was considered permanent. In this study, all the observed cases had transient episodes of hypocalcaemia with no need for long term treatment. Calcium was supplemented parenterally till 3rd post-operative day in severe cases and then switched to oral route for another two weeks. Dietary supplements were adequate in most cases in this study.

Hoarseness of voice was attributed primarily to intubation for GA and usage of electrocautery for dissection which lead to RLN injury causing neuropraxia. Better surgical technique with judicious tissue handling and usage of sharp dissection instead of electrocautery especially in proximity to the RLN had lesser incidence of postoperative hoarseness of voice. Post operative nebulisation, voice rest and steroids were given to

people with hoarseness of voice. IDL was done to assess vocal cord status in doubtful cases which were all found to be normal. Complete recovery was observed in all patients.

Wound site infection were tended to with higher antibiotics and diabetic control. Hematoma was non debilitating and settled with conservative management. The present study did not focus on the late post-operative complications.

V. Conclusion

This study is an observational study to assess the incidence of early complications following total thyroidectomy in a tertiary care government setup in rural and sub-urban part of Tamil Nadu. An attempt was made to correlate the frequency of post op complications with pre existing comorbidities in the study population. The results obtained were comparable to that in the literature. However, the study is a single centric research and was done using consecutive sampling methods. Large scale prospective or retrospective studies with multiple centers will provide better idea on the incidence of post-operative complications after total thyroidectomy.

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