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ORIGINAL ARTICLE

Frequency of asymptomatic hypocalcaemia in post-thyroidectomy patients: An experience in tertiary care hospital.

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ABSTRACT… Objective: To determine the frequency of post-operative asymptomatic hypocalcaemia in patients with total and subtotal thyroidectomy. **Study Design:** Cross-sectional study. **Setting:** Department of Surgery, Sheikh Zayed Hospital, Rahim Yar Khan. **Period:** 1st July 2021 to 30th April 2022. **Material & Methods:** One hundred and Sixteen post thyroidectomy male and female patients of age 18-50 years were included in the study using consecutive sampling technique and two groups were formed. Group-A included those patients who underwent total thyroidectomy and in Group-B patients underwent sub-total thyroidectomy. Samples for serum calcium levels were collected in gel tube before and 24 hours after surgery. Post-operative Hypocalcemia was defined by serum total calcium < 8.5 mg/dL 24 hours after surgery. Patients with symptomatic post-operative hypocalcemia following total or subtotal thyroidectomy or hypocalcemia due to any other reason or systemic disease e.g. renal disease and pregnant females were excluded by history and medical record. Data was analyzed using SPSS 20. **Results:** In Group A the Mean age was 30.94 ±9.6 years, while those in Group B were 31.59± 11.03 years. In Group A 62 (35.63%) and in 30 (17.245%) of Group B patients respectively were identified with asymptomatic hypocalcemia. A statistically significant difference was seen in both groups. 0.00 is the probability value. **Conclusion:** When compared to sub-total thyroidectomy, the frequency of asymptomatic hypocalcaemia was substantially higher following total thyroidectomy. Asymptomatic hypocalcaemia after complete or partial thyroidectomy might affect both men and women equally. After subtotal or total thyroidectomy, both younger and older age groups had an equal likelihood of developing asymptomatic hypocalcaemia.

Key words: Asymptomatic Hypocalcemia, Hypocalcemia, Multinodular Goiter, Subtotal Thyroidectomy, Total Thyroidectomy.

INTRODUCTION

Thyroidectomy is a common procedure, and one of the risks is post-operative hypocalcaemia, which affects 0.33 % to 65 percent of patients.[1] Clinically and biochemically, hypocalcaemia is seen in both complete and subtotal thyroidectomies. Carpopedal spasms, facial muscle twitching, impatience, and even convulsions are common symptoms of hypocalcaemia. It can, on the other hand, be absolutely symptomless.[2,3,4,5] It causes the patient a lot of pain not only in the immediate post-operative time, but it can also be a long-term issue. As a result, it's critical to monitor the patient's clinical and biochemical profile. This will help to reduce morbidity and death in people who have had thyroid surgery. Temporary hypocalcaemia after thyroid surgery occurs in 1.6 % to 50% of cases, while persistent hypocalcaemia occurs in 1.5 percent to 4% of cases, according to the literature.[6] Hemodilution due to intravenous fluid administration during the perioperative period, increased urine calcium excretion due to surgical stress, calcitonin release following thyroid gland surgery, and hungry bone syndrome in patients with metabolic bone disease are all causes of hypocalcaemia.[7] Early diagnosis of low calcium levels, even if asymptomatic, may help to avoid unnecessary hospitalization. When serum calcium levels fall below 8 mg/dl (normal range 8.5-10.5 mg/dl), hypocalcaemia

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symptoms appear.[8] After surgery, a rapid drop in serum calcium levels is a good predictor of later clinically symptomatic hypocalcaemia.[9] Total thyroidectomy was performed in 130 patients with multinodular goiter in one study and 31.2 % of the patients had asymptomatic hypocalcaemia.[10] The results of another data collected from a study showed that19.6% of total patients with multinodular goiter had developed asymptomatic hypocalcemia following subtotal thyroidectomy.[11]

Given the foregoing, our study aims to determine the prevalence of asymptomatic hypocalcaemia in total and sub-total thyroidectomy post-operative patients in order to reduce the morbidity and mortality associated with it. In the future, we will advocate one strategy over the other based on the study's findings.

MATERIAL & METHODS

This cross-sectional study was undertaken in the surgical department of Sheikh Zayed Hospital in Rahim Yar Khan from July 1st, 2021 to April 30th 2022 after approval from IRB (217/IRB/SZMC/SZH). By using a successive sampling procedure, 116 adult patients between the ages of 18 and 50 who had a multinodular goiter or a single nodule in their thyroid were divided into two groups of 58 individuals each. Total thyroidectomy was performed on patients in group A, while subtotal thyroidectomy was performed on patients in group B. Thyroid procedures were conducted by surgeons with at least two years of post-fellowship thyroid surgery experience. At least two parathyroid glands were found and saved during the procedure. Before and 24 hours after surgery, serum calcium levels were measured in a gel tube. Serum total calcium 8.5 mg/dL 24 hours after surgery was defined as post-operative asymptomatic hypocalcemia. Patients suffering with clinical sign and symptoms of hypocalcemia post operatively after undergoing total and subtotal thyroidectomy were excluded. Likewise patients diagnosed with hypocalcemia due to systemic illness (CLD, CKD) and pregnant females were identified and excluded.

RESULTS

This study included 116 patients undergoing thyroidectomy. Of these 39 (33.6%) were males and 77 (66.4%) were females. Mean age of the patients was 31.27 ± 10.33 years. Asymptomatic hypocalcemia was observed in 21 patients in group A while in 37 patient's serum calcium levels were within normal range. In group B, 10 patients developed asymptomatic hypocalcemia and 48 patients had normal serum calcium levels postoperatively. Total 31 (26.72%) patients in both groups developed asymptomatic hypocalcemia postoperatively and this was more common in patients undergoing total thyroidectomy (p = 0.001) (Table-I). Incidence of asymptomatic hypocalcemia with respect to gender and age is shown in Table-II. Gender and age were not a predictor of hypocalcemia as shown in Table-II.

Type of Surgery	Asymptomatic Hypocalcemia		Total Cases	P-Value
	Yes (%)	No (%)		
Total thyroidectomy (Group A)	21(36.21%)	37(63.79%)	58 (100%)	0.001
Subtotal thyroidectomy (Group B)	10(17.24%)	48(82.76%)	58 (100%)	

Table-I. Frequency of asymptomatic hypocalcemia in total and subtotal thyroidectomy patients.

Demographic Characteristics		Asymptomatic Hypocalcemia After Total Thyroidectomy				Asymptomatic Hypocalcemia After Subtotal Thyroidectomy			
		Yes (%)	No (%)	Total (%)	P-Value	Yes (%)	No (%)	Total (%)	P-Value
Gender	Male	7 (36.84%)	12 (63.16%)	19	0.502	3 (15%)	17 (85%)	20	0.675
	Female	13 (33.3%)	26 (66.7%)	39		7 (18.42%)	31 (81.58%)	38	
	Total	20	38	58		10	48	58	
Age	18-32 years	13 (38.1%)	22 (61.9%)	35	0.423	6 (18.81%)	28 (81.19%)	34	0.549
	33-50 years	7 (31.88%)	16 (68.12%)	23		4 (15.1%)	20 (84.9%)	24	

Table-II. Age and gender distribution of patients with asymptomatic hypocalcemia following total and subtotal hypocalcemia.

DISCUSSION

Symptomatic hypocalcemia typically appears within 1-2 days of surgery.[12] The diagnosis and management of postoperative hypocalcemia have been approached in a variety of ways. Many institutions throughout the world still use the traditional 2-day stay and serum calcium monitoring after thyroidectomy.[13] In the initial postoperative phase, patient observation is required for hemorrhage and airway obstruction, which may necessitate an urgent return to the operating room[14]; however, in the absence of apparent perioperative complications, serum calcium monitoring with hospitalization beyond 24 hours is often unnecessary because patients typically experience only mild postoperative pain and quickly return to baseline daily function.[15,16] The quantity of intact parathyroid hormone (iPTH) in the blood is an early indicator of hypocalcemia after thyroidectomy.[17]

Hypocalcemia after thyroid surgery is complex. Hemodilution due to intravenous fluid administration during the perioperative phase, increased urinary calcium excretion due to surgical stress, calcitonin release after thyroid gland manipulation, and hungry bone syndrome in patients with metabolic bone disease are all suggested contributory factors.[16] The most common cause of postoperative hypocalcemia is hypoparathyroidism caused by direct damage, removal, or devascularization of the parathyroid glands.[17,18]

The prevalence of asymptomatic hypocalcaemia was evaluated in patients who had subtotal or total thyroidectomy in this study. Two groups were formed for this aim. Patients in Group A got total thyroidectomy, while those in Group B underwent sub-total thyroidectomy. Asymptomatic hypocalcaemia was found to be more common in Group A (35.63 percent) than in Group B in this investigation (17.24 percent). In a study conducted in Bangladesh by Islam MS et al[19], a total of 65 patients were enrolled, all of them were undergoing complete thyroidectomy, regardless of their age or gender. A total of 88 percent of people had asymptomatic hypocalcemia. This study's findings are far more convincing to the result collected in our study. After total thyroidectomy, Iqbal J et al[20] found that 18.8% of people had asymptomatic hypocalcaemia.

Asymptomatic hypocalcaemia was reported in 24.14 percent of individuals in another investigation by Malik V et al.[21] All of the patients had their thyroids removed completely. This study's findings are comparable to those of the current study. Total thyroidectomy was performed in 130 patients with multinodular goiter in one study by Erbil Y et al, and 31.2 percent of the patients had asymptomatic hypocalcaemia.[22] In another study, LankaraniM et al performed subtotal thyroidectomy on 102 patients with multinodular goiter, and 19.6% of the patients had asymptomatic hypocalcaemia.[23]

Asymptomatic hypocalcaemia was seen in 39.29 percent of male patients and 33.9 percent of female patients after complete thyroidectomy in this study. Asymptomatic hypocalcaemia was found in 21.4 percent of male patients and 35.8% of female patients, according to Dez Alonso M et al.[24] These findings are similar to those of my research. In this study, no significant (p. value 0.423) difference in post thyroidectomy asymptomatic hypocalcaemia was detected between the younger and older age groups. Unalp HR et al, on the other hand, found a significant increase in asymptomatic hypocalcaemia in the older age group. Asymptomatic hypocalcaemia was found in 41.2 percent of the 34 participants in their study.[25]

CONCLUSION

In comparison to sub-total thyroidectomy, the frequency of asymptomatic hypocalcaemia was substantially higher following total thyroidectomy. Asymptomatic hypocalcaemia after complete or partial thyroidectomy might affect both men and women equally. After complete or subtotal thyroidectomy, both younger and older age groups had an equal likelihood of developing asymptomatic hypocalcaemia.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Muhammad Tariq Ghafoor	Main concept, Study design and literature review.	
2	Sajida Naseem	Acquisition of data or analysis & interpretation of data.	
3	Mehvish Sana	Acquisition of data or analysis & interpretation of data.	
4	S. Sabahat Haider	Discussion and review of literature.	
5	Noureen Kausar	Babilography.	
6	Sohail Sabir	Data collection and analysis.