

Research Article

**Comparative study between total thyroidectomy and subtotal
thyroidectomy in term of post operative
asymptomatic hypocalcemia**

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ABSTRACT

Introduction: Thyroidectomy is a frequently performed operation, one of its complication is post-operative hypocalcaemia which occurs in about 0.33% to 65% patients. Hypocalcaemia is evident in both total and subtotal thyroidectomy clinically and biochemically. Hypocalcaemia is usual symptomatic showing carpopedal spasms, twitching of the facial muscles, irritability and even seizures. On the other hand it can be completely asymptomatic. It causes great misery to the patient not only in immediate post-operative period but can also be a permanent problem.

Objective: To compare the frequency of post-operative asymptomatic hypocalcaemia in patients with multinodular goiter undergoing total versus subtotal thyroidectomy.

Study Design: Randomized Controlled Trial.

Settings: The study was conducted at surgical department DHQ Hospital, Sheikhupura

Duration of Study: March 2017 to September 2017

Results: Mean age of the patients of Group A was 30.94 ± 9.6 years and Group B was 31.59 ± 11.03 . Asymptomatic hypocalcaemia was found in 62 (35.63%) patients of Group A and 30 (17.245%) patients of Group B. Significant difference was observed in both groups statistically. P. value 0.00.

Conclusion: Frequency of asymptomatic hypocalcaemia was significantly higher after total thyroidectomy as compare to sub-total thyroidectomy. Male or female can be equally victim of asymptomatic hypocalcaemia after total or subtotal thyroidectomy. There is an equal chance of development of asymptomatic hypocalcaemia in younger and older age groups after total or subtotal thyroidectomy.

Key Words: MNG, FNAC, HPE, thyroid isotope scan, thyrotoxicosis, subtotal thyroidectomy, total thyroidectomy

INTRODUCTION:

Thyroidectomy is a frequently performed operation, one of its complication is post-operative hypocalcaemia which occurs in about 0.33% to 65% patients.¹ Hypocalcaemia is evident in both total and subtotal thyroidectomy clinically and biochemically. Hypocalcaemia is

usual symptomatic showing carpopedal spasms, twitching of the facial muscles, irritability and even seizures. On the other hand it can be completely asymptomatic.^{2,3,4,5} It causes great misery to the patient not only in immediate post-operative period but can also be a permanent

problem. That's why it is important to keep an eye on the patient's clinical and biochemical profile. This will be helpful to decrease the mortality and morbidity in post thyroidectomy patients. In the literature, the incidence of temporary hypocalcaemia after thyroid surgery ranges from 1.6% to 50%, and permanent hypocalcaemia occurs in 1.5% to 4% of surgeries.⁶ The causes of hypocalcaemia include hemodilution secondary to intravenous fluid administration during the perioperative phase, increased urinary calcium excretion secondary to surgical stress, calcitonin release after thyroid gland manipulation, and hungry bone syndrome in patients with metabolic bone disease.⁷ However, hypoparathyroidism through direct injury, removal or devascularization of parathyroid glands is the most likely cause of postoperative hypocalcaemia.⁷ Acute, severe hypocalcaemia is a medical emergency so it needs immediate remedy. Hypocalcaemia potentially prolongs the hospital stay. Early detection of low calcium level even at asymptomatic stage may reduce unnecessary stay.⁸ The symptoms of hypocalcaemia become evident when serum level drops below 8 mg/dl (normal range 8.5-10.5 mg/dl).⁸ Immediate fall in serum calcium level after surgery is a sensitive predictor for later clinically symptomatic hypocalcaemia.⁹

Keeping in view the above facts hypocalcaemia which in thyroidectomy patients present as medical emergency and needs immediate management, our study was designed to find out the frequency of post-operative asymptomatic hypocalcaemia between total and sub-total thyroidectomy. So that to decrease the morbidity and mortality related to it. Also depending on the results of the study, we will recommend one better technique over the other in future.

OPERATIONAL DEFINITION

Asymptomatic Hypocalcaemia: Serum calcium level <2mmol/l (8mg/dl) not showing clinical signs and symptoms of hypocalcaemia after 24 hours of surgery was labelled as asymptomatic hypocalcaemia.

MATERIAL AND METHODS

Study Design: Randomized Controlled Trial

Setting: The study was conducted at surgical department DHQ Hospital, Sheikhpura.

Duration of the study: March 2017 to September 2017

Inclusion Criteria:

- Patients who have undergone total or subtotal thyroidectomy.
- Both male and female.
- Age from 14 to 50 years.

Exclusion Criteria:

- Patients who have hypocalcaemia due to any other reason or systemic disease e.g. renal disease, lactating mother either pre or post operatively.
- Symptomatic post-operative hypocalcaemia following total or subtotal thyroidectomy.

DATA COLLECTION PROCEDURE

All patients who would underwent total or subtotal thyroidectomy were included in this study after scrutinized by inclusion criteria and after taking written consent from Institutional Review Board. Written consent was taken from every patient. All included patients for surgery (total or subtotal thyroidectomy) was offered to pick up a slip from total mixed up slips (half-slips was contain letter "A" and other half-slips contain letter "B") and he/she was placed in that group (Group-A or Group-B according to slip). Group-A include those patients who were undergo total thyroidectomy and Group-B include those patients who were undergo sub-total thyroidectomy.

Serum calcium level was sent to the relevant laboratory before the surgery and after 24 hours of surgery. Demographic data including age, gender, type of surgery was entered into a predesigned proforma.

DATA ANALYSIS PROCEDURE:

The data was entered in SPSS V16 for statistical analysis. Quantitative variable like age was presented as mean \pm SD, while qualitative variable like gender, asymptomatic hypocalcaemia was presented in frequency and

percentages. Chi-square test was applied to compare the frequency of asymptomatic hypocalcemia in both groups. Stratification was done for age and gender. Post stratification. Chi-square test was applied to see the level of significance. P-values ≤ 0.05 was considered statistically significant.

RESULTS:

All the data was entered in SPS version 16 and analyzed. Mean age of the patients was 31.27 ± 10.33 of all 348 patients. Mean age of the patients of Group A was 30.94 ± 9.6 years and Group B was 31.59 ± 11.03 . Table 1

As shown in Fig. 1, in Group A 56(32%) patients were male and 118 (68%) patients were female. In Group B, male patients were 60(34%) and female patients were 114(66%). Fig. 2.

Group A was consisted on 174 patients and total thyroidectomy was performed in this group. Asymptomatic hypocalcaemia was found in 62 (35.63%) patients. In Group B, subtotal thyroidectomy was performed in 174 patients and asymptomatic hypocalcaemia was observed in 30 (17.245%). Significant difference was observed in both groups statistically. P. value 0.00. (Table 2).

Stratification with respect to male was done. Among the 56 patients of group A, asymptomatic hypocalcaemia was observed in 22 (39.29%) patients and in 60 patients of Group B, asymptomatic hypocalcaemia was seen in 9 (15%) patients. Significantly higher rate of asymptomatic hypocalcaemia was seen in patients of Group A as compare to Group B. P. value 0.003. Table 3. Out of 118 female patients of group A, asymptomatic hypocalcaemia was seen 40 (33.9%) female patients and out of 114 female patients of Group B, asymptomatic hypocalcaemia was seen 21 (18.425) patients. Significantly

higher proportion for asymptomatic hypocalcaemia was seen in patients of group A as compare to patients of group B. P. value 0.010. Table 4.

Comparison of frequency of asymptomatic hypocalcaemia in age group 18-32 years between both groups was done. Among the 105 patients of group A, asymptomatic hypocalcaemia was seen in 40 (38.1%) patients. Out of 101 patients of group B, asymptomatic hypocalcaemia was seen 19 (18.81%) patients. Significant difference for frequency of asymptomatic hypocalcaemia between the both groups was observed. P. value 0.003. Table 5. In age group 33-50 years, out of 69 patients of group A asymptomatic hypocalcaemia was seen in 22 (31.89%) patients and out of 73 patients of group B, asymptomatic hypocalcaemia was observed in 11 (15.07%) patients. Significantly higher proportion of asymptomatic hypocalcaemia in group A was observed as compare to group B. P. value 0.028. Table 6.

Stratification with respect ASA grade I was done. Among the 93 patients of group A, asymptomatic hypocalcaemia was seen in 30 (32.26%) patients and out of 57 patients of group B, asymptomatic hypocalcaemia was seen in 12 (21.05%) patients. Insignificant (p = 0.189) difference between the proportion of asymptomatic hypocalcaemia was seen between the both groups. Table 7. Among the 81 patients with ASA Grade II in group A, asymptomatic hypocalcaemia was seen in 32 (39.51%) patients and among the 117 with ASA grade II in group B, asymptomatic hypocalcaemia was observed 18 (15.38%) patients. A higher proportion of asymptomatic hypocalcaemia in patients of group A was seen as compare to group B. P. value 0.000. Table 8.

Table No1: Mean of the patients of both groups

Group	n	Mean	SD
A	174	30.94	9.6
B	174	31.59	11.03
Total Sample	348	31.27	10.33

Fig. 1: Gender Distribution for group A

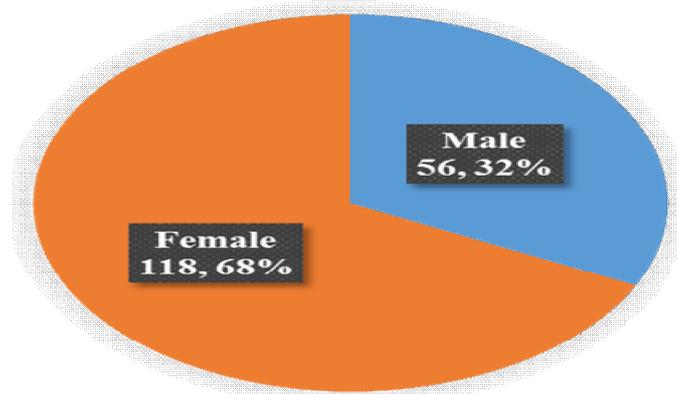


Fig. 2: Gender Distribution for group B

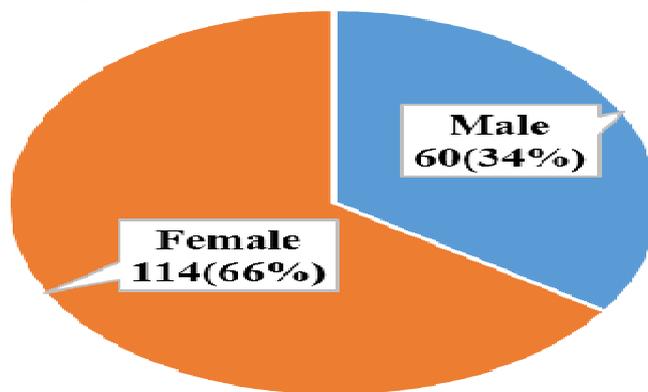


Table 2: Comparison of Asymptomatic Hypocalcaemia between both groups

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	62 (35.63)	112 (64.37)	174	0.00
B	30 (17.24)	144 (82.76)	174	

Table 3: Stratification with respect to male

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	22 (39.29)	34 (60.71)	56	0.003
B	9 (15)	51 (85)	60	

Table 4: Stratification with respect to female

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	40 (33.9)	78 (66.1)	118	0.010
B	21 (18.42)	93 (81.58)	114	

Table 5: Stratification for age group 18-32 years

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	40 (38.1)	65 (61.9)	105	0.003
B	19 (18.81)	82 (81.18)	101	

Table 6: Stratification for age group 33-50 years

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	22 (31.89)	47 (68.11)	69	0.028
B	11 (15.07)	62 (84.93)	73	

Table 7: Stratification with respect to ASA Grade I

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	30 (32.26)	63 (67.74)	93	0.189
B	12 (21.05)	45 (78.95)	57	

Table 8: Stratification with respect to ASA Grade II

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
A	32 (39.51)	49 (60.49)	81	0.000
B	18 (15.38)	99 (84.62)	117	

DISCUSSION:

The development of post-thyroidectomy hypocalcaemia is multifactorial. The suggested contributory factors include hemodilution secondary to intravenous fluid administration during the perioperative phase, increased urinary calcium excretion secondary to surgical stress, calcitonin release after thyroid gland manipulation, and hungry bone syndrome in patients with metabolic bone disease. However, hypoparathyroidism through direct injury, removal or devascularization of parathyroid glands is the most likely cause of postoperative hypocalcemia.¹⁰

In present study frequency of asymptomatic hypocalcaemia was significantly higher in patients of Group A 37.5% as compare to Group B

(15.83%). In a study conducted by Islam MS et al¹¹ in Bangladesh, Total 65 patients were enrolled those came for total thyroidectomy irrespective of age and sex. The incidence of asymptomatic hypocalcaemia was 88%. Findings of this study are much higher than our study. Iqbal J et al¹² reported asymptomatic hypocalcaemia in 18.8% patient in his study after total thyroidectomy. In another study by Malik V et al,¹³ frequency of asymptomatic hypocalcaemia was found in 24.14% patients. All the patients underwent total thyroidectomy. Findings of this study is comparable with the present study. In one study of Erbil et al, total thyroidectomy was performed in 130 patients with multinodular goiter and asymptomatic hypocalcaemia was found in 31.2% patients.¹⁵ In another study by Lankarani et al,

sub-total thyroidectomy was performed in 102 patients with multinodular goiter and asymptomatic hypocalcaemia was found in 19.6% patients.¹⁶In another study by Gentileschi et al,¹⁷ asymptomatic hypocalcaemia was reported as 19.27%. In the present study, asymptomatic hypocalcaemia was seen in male patients of Group A and B as 47.37% and 17.07% respectively and in female patients of Group A and B as 39.02% and 20.25% respectively. Díez et al,¹⁸ observed asymptomatic hypocalcaemia in 21.4% male and 35.8% female patients. These findings are comparable with my study. In present study, significant (P= 0.015) difference was found in younger and older age groups for post thyroidectomy asymptomatic hypocalcaemia. But Unalp HR et al¹⁹ observed significant higher asymptomatic hypocalcaemia in older age group. In their study out of 34 patients, asymptomatic hypocalcaemia was seen in 41.2% patients.

CONCLUSION:

Frequency of asymptomatic hypocalcaemia was significantly higher after total thyroidectomy as compare to sub-total thyroidectomy. Male or female can be equally victim of asymptomatic hypocalcaemia after total or subtotal thyroidectomy. There is an equal chance of development of asymptomatic hypocalcaemia in younger and older age groups after total or subtotal thyroidectomy.

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