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Research Article

**COMPARISON OF POST-OPERATIVE ASYMPTOMATIC  
HYPOCALCEMIA BETWEEN TOTAL THYROIDECTOMY  
AND SUBTOTAL THYROIDECTOMY**<sup>1</sup>Dr. Fawad Hameed, <sup>2</sup>Dr. Fariha Niaz, <sup>3</sup>Dr. Ali Gohar Khan<sup>1</sup>Assistant Professor, Department of Surgery, Shahida Islam Medical College, Lodhran<sup>2</sup>Assistant Professor of Biochemistry, Sahiwal Medical College Sahiwal<sup>3</sup>Head of Department of Surgery Fauji Foundation Hospital Peshawar**Article Received:** November 2019 **Accepted:** December 2019 **Published:** January 2020**Abstract:**

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

**Material and methods:** This randomized controlled trial was conducted at Department of Surgery Shahida Islam Medical College, Lodhran from January 2018 to June 2018 over the period of 6 months. Total 348 patients who have undergone total or subtotal thyroidectomy having age 14-50 years either male or female were selected.

**Results:** Mean age of the patients of Group A was  $30.94 \pm 9.6$  years and Group B was  $31.59 \pm 11.03$ . 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

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## INTRODUCTION:

Thyroidectomy is a frequently performed operation, one of its complication is post-operative hypocalcaemia which occurs in about 0.33% to 65% patients.<sup>1</sup> 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.<sup>2,3,4,5</sup> 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.<sup>6</sup> 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.<sup>7</sup> However, hypoparathyroidism through direct injury, removal or devascularization of parathyroid glands is the most likely cause of postoperative hypocalcaemia.<sup>7</sup> 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.<sup>8</sup> The symptoms of hypocalcaemia become evident when serum level drops below 8 mg/dl (normal range 8.5-10.5 mg/dl).<sup>8</sup> Immediate fall in serum calcium level after surgery is a sensitive predictor for later clinically symptomatic hypocalcaemia.<sup>9</sup>

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.

## 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:

This randomized controlled trial was conducted at Department of Surgery Shahida Islam Medical College, Lodhran from January 2018 to June 2018

over the period of 6 months. Total 348 patients who have undergone total or subtotal thyroidectomy having age 14-50 years either male or female were selected. Patients who have hypocalcaemia due to any other reason or systemic disease e.g. renal disease, lactating mother either pre or post operatively were excluded from the study.

Study was approved by ethical committee of the hospital and written informed consent was taken from every patient.

Selected patients were randomly divided into two groups A & B. Group-A include those patients who were undergo total thyroidectomy and Group-B include those patients who were undergo sub-total thyroidectomy. After surgery, blood sample was taken from every patient and send to laboratory for serum calcium level after 24 hours of surgery. Demographic data including age, gender, type of surgery was entered into a predesigned proforma.

The data was entered in SPSS V18 for statistical analysis. Quantitative variable like age was presented as mean  $\pm$  SD, while qualitative variable like gender, ASA Grade and asymptomatic hypocalcemia 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, gender and ASA grade. Post stratification. Chai-square test was applied to see the level of significance. P-values  $\leq$  0.05 was considered statistically significant.

## RESULTS:

Mean age of the patients was  $31.27 \pm 10.33$  of all 348 patients. Mean age of the patients of Group A was  $30.94 \pm 9.6$  years and Group B was  $31.59 \pm 11.03$ . 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 1) Among the 56 male patients of group A, asymptomatic hypocalcaemia was observed in 22 (39.29%) patients and in 60 male patients of Group B, asymptomatic hypocalcaemia was seen in 9 (15%) patients. Significantly (P. value 0.003) higher rate of asymptomatic hypocalcaemia was seen in male patients of Group A as compare to Group B. 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 (P. value 0.010) higher proportion of asymptomatic hypocalcaemia was seen in patients of group A as compare to patients of group B. Table 2

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 (P. value 0.003) difference of frequency of asymptomatic hypocalcaemia between the both groups was observed. 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 (P. value 0.028) higher proportion of asymptomatic hypocalcaemia in group A was observed as compare to group B. (Table 3)

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. 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. Significantly (P. value 0.000) higher proportion of asymptomatic hypocalcaemia in patients of group A was seen as compare to group B. Table 4

**Table 1: 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 2: Stratification with respect to gender**

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
<b>Male Patients</b>				
A	22 (39.29)	34 (60.71)	56	0.003
B	9 (15)	51 (85)	60	
<b>Female Patients</b>				
A	40 (33.9)	78 (66.1)	118	0.010
B	21 (18.42)	93 (81.58)	114	

**Table 3: Stratification for age**

Group	Asymptomatic Hypocalcaemia-		Total	P. Value
	Yes (%)	No (%)		
<b>Age group 18-32 years</b>				
A	40 (38.1)	65 (61.9)	105	0.003
B	19 (18.81)	82 (81.18)	101	
<b>Age group 33-50 years</b>				
A	22 (31.89)	47 (68.11)	69	0.028
B	11 (15.07)	62 (84.93)	73	

**Table 4: Stratification with respect to ASA Grades**

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes (%)	No (%)		
<b>ASA Grade I</b>				
A	30 (32.26)	63 (67.74)	93	0.189
B	12 (21.05)	45 (78.95)	57	
<b>ASA Grade II</b>				
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 hypocalcaemia.<sup>10</sup>

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 al<sup>11</sup> 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 al<sup>12</sup> reported asymptomatic hypocalcaemia in 18.8% patient in his study after total thyroidectomy. In another study by Malik V et al,<sup>13</sup> 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.<sup>15</sup> 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.<sup>16</sup> In another study by Gentileschi et al,<sup>17</sup> 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 el al,<sup>18</sup> 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 al<sup>19</sup> 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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