ORIGINAL ARTICLE

Comparison of Postoperative Asymptomatic Hypocalcaemia in patients undergoing Total versus Subtotal Thyroidectomy

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ABSTRACT

Aim: To compare the frequency of post-operative asymptomatic hypocalcaemia in patients with multinodular goiter undergoing total versus subtotal thyroidectomy.
Methods: This randomized controlled trial was consisted on 120 patients. Patients who would underwent total or subtotal thyroidectomy either male or female and having age from 18 to 50 years presenting at Department of Surgery DHQ Teaching Hospital, Sahiwal from May 2014 to December 2014 were enrolled in this study.
Results: Mena age of the patients was 31.27±10.33 years and mean age of the patients of Group A was 31.52±8.7 years and in Group B was 32.45±10.08. Asymptomatic hypocalcaemia was found in 45(37.5%) patients of Group A and in 19(15.83%) patients of Group B. Statistically Significant (P=0.001) difference between the frequency of asymptomatic hypocalcaemia was observed in patients underwent total or sub-total thyroidectomy.
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.
Keywords: MNG, FNAC, HPE, thyroid isotope scan, thyrotoxicosis, subtotal 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 para-thyroid 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 8mg/dl (normal range 8.5-10.5mg/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.

MATERIAL AND METHODS

This randomized controlled trial was consisted on 120 patients. Patients who would underwent total or subtotal thyroidectomy either male or female and having age from 18 to 50 years presenting at

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Department of Surgery DHQ Teaching Hospital, Sahiwal from May 2014 to December 2014 were enrolled in this study.Patients who have hypocalcaemia due to any other reason or systemic disease e.g. renal disease, lactating mother either pre or post operatively and symptomatic post-operative hypocalcaemia following total or subtotal thyroidectomy were excluded from the study.An approval was taken from institutional review committee and written informed consent was taken from every patient.

Selected patients were divided into two Groups A and B. In patients of Group A, total thyroidectomy was performed and in patients of Group B, sub-total thyroidectomy was performed.

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

After 24 hours of thyroidectomy (total or sub-total thyroidectomy), 5ml blood sample was taken from every patient and send to laboratory for serum calcium level. Findings of the laboratory along with demographic data including age, gender, type of surgery was entered in predesigned proforma.

All the collected data entered in SPSS version 17 and analyzed. Mean and standard deviation was calculated for age and frequencies and percentages was calculated for asymptomatic hypocalcaemia and gender. Chi-square test will be applied to compare the frequency of asymptomatic hypocalcemia between the both groups. Chai-square test will be applied to see the level of significance. P-value ≤ 5% will be considered statistically significant

RESULTS

Mean age of the patients was 31.27±10.33 years. Mean age of the patients of Group A was 31.52±8.7 years and in Group B was 32.45± 0.08.

Group A was consisted on 120 patients and total thyroidectomy was performed in this group. Asymptomatic hypocalcaemia was found in 45 (37.5%) patients. In Group B, subtotal thyroidectomy was performed in 120 patients and asymptomatic hypocalcaemia was observed in 19 (15.83%). Significant (P= 0.000) difference was observed between the both groups for the frequency of asymptomatic hypocalcaemia (Table 1).

Stratification with respect to gender of both groups was done. Comparison for the frequency of asymptomatic hypocalcaemia between the male patients of both groups and female patients of both groups was done. Among the 38 male patients of group A, asymptomatic hypocalcaemia was observed in 18(47.37%) patients and in 41 male patients of Group B, asymptomatic hypocalcaemia was seen in 7(17.07%) patients. Statistically significant (P=0.007) difference between the male patients of both groups for the frequency of asymptomatic hypocalcaemia was seen. Out of 82 female patients of Group A, Asymptomatic hypocalcaemia was seen in 32(39.02%) patients and among the 79 female patients of Group B, Asymptomatic hypocalcaemia was observed in 16(20.25%) patients. Statistically significant (P=0.010) difference between the both groups for the frequency of asymptomatic hypocalcaemia was seen (Table 2).

Table 1: Comparison of Asymptomatic Hypocalcaemia between both groups

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes	No		
A	45(37.5%)	75(62.5%)	120	0.001
B	19(15.83%)	101(84.17%)	120	

Table 2: Comparison of asymptomatic hypocalcaemia between both groups for male and female

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes	No		
Male patients of both groups				
A	18(47.37%)	20(52.63%)	38	0.007
B	7(17.07%)	34(82.93%)	41	
Female patients of both groups				
A	32(39.02%)	50(60.98%)	82	0.010
B	16(20.25%)	63(79.75%)	79	

Patients of the both groups were divided into two age groups, age group 18-32 years and age group 33-50 years. Comparison for the frequency of asymptomatic hypocalcaemia between the age group 18-32 years and age group 33-50 years of both groups was done. Among the 72 patients of age group 18-32 years, a symptomatic hypocalcaemia was seen in 25(37.5%) patients and out of 70 patients of age group 33-50 years, a symptomatic hypocalcaemia was seen in 13(18.58%) patients. Statistically significant (P=0.015) difference between the both groups for the frequency of asymptomatic hypocalcaemia was seen. In age group 33-50 years, asymptomatic hypocalcaemia was seen in 16/48 (33.33%) patients and 7/50 (14%) patients respectively form Group A and Group B. Statistically significant (P=0.032) difference between the both groups for the frequency of asymptomatic hypocalcaemia was seen (Table 3).

Table 3: Comparison of asymptomatic hypocalcaemia between both groups for different age groups

Group	Asymptomatic Hypocalcaemia		Total	P. Value
	Yes	No		
Age group 18-32 years				
A	27(37.5%)	45(62.5%)	72	0.015
B	13(18.58%)	57(81.42%)	70	
Age group 33-50 years				
A	16(33.33%)	32(66.67%)	48	0.032
B	7(14%)	43(86%)	50	

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 al[11] 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[12] 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 were 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.[16]In 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 el 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 al[19] 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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