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Transient Hypocalcaemia in Total Versus Near Total Thyroidectomy

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ABSTRACT

Objective — *To compare the frequency of transient hypocalcaemia in total versus near total thyroidectomy.*

Study design — *Randomised controlled trial.*

Place & Duration of study — *Department of General Surgery, Surgical ward 2, Jinnah Postgraduate Medical Centre Karachi, from April 2015 to January 2016.*

Methodology — *Patients of thyroid diseases with no lymph node involvement, were included in this study. Patients were randomly divided into two groups, A and B. Total thyroidectomy was performed in group A and near total thyroidectomy in group B. Final assessment was done at the end of 4th week postoperatively to label the patient as having transient hypocalcaemia.*

Results — *A total of 128 patients of thyroid diseases were enrolled with 64 patients each group. Mean age of the patients was 32.19±6.31 year. Frequency of hypocalcaemia was significantly high in group A as compared to group B (12.5% vs. 3.1% p=0.048)*

Conclusion — *The frequency of hypocalcaemia was more in patients who underwent with total thyroidectomy.*

Key words — *Hypocalcaemia, Total thyroidectomy, Near total thyroidectomy.*

INTRODUCTION:

Thyroid disorders are the second most common endocrine disorders.[1] Surgery is the treatment of choice for thyroid diseases.[2,3] Subtotal thyroidectomy, near total thyroidectomy, and total thyroidectomy are commonly performed surgical procedures.[3,4,5] Near total thyroidectomy and total thyroidectomy are preferable surgical techniques used.[6] Choice of surgical procedure must be designed to achieve maximum benefit to the patient.[7,8]

Transient hypocalcemia is most common complication after thyroidectomy.[9] Other complications are vocal cord paralysis and bleeding.[6] Kocher first recognized post thyroidectomy tetany in 1883.[10] Contributing factors in development of postoperative transient hypocalcaemia are devascularization of parathyroid glands, removal of one or more parathyroid glands and hematoma formation etc.[11] Frequency of post thyroidectomy hypocalcaemia differs in literature ranging from 0.3 – 66.2%.[2,9,12] .Researchers define hypocalcaemia on the basis of clinical presentation as well as by measuring serum calcium level. The aim of this study was to assess transient hypocalcaemia in total and near total thyroidectomy procedures.

METHODOLOGY:

This Randomized controlled trial was conducted in the Department of General Surgery, Surgical ward 2, Jinnah Postgraduate Medical Centre Karachi. from April 2015 to January 2016. Consecutive non probability sampling was used. Patients of either sex, age between 18 to 70 years, having multinodular goiter or thyroid cancer without lymph node involvement, were included in this study. Patients

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already on calcium, or vitamin D therapy, history of radiotherapy. and preoperative hypocalcaemia, were excluded.

Patients were divided into two groups with equal number of patients. In group A total thyroidectomy (both lobes of thyroid and isthmus removed) and in group B patients near total thyroidectomy (one lobe of thyroid and isthmus completely removed, and in other lobe resection done leaving 1-2 grams of thyroid tissue) were performed. Final assessment was done on follow up at the end of 4th week to label transient hypocalcaemia.

After operation serum calcium level was monitored at 6 hours after surgery, then at day 2, and day 3. Serum calcium below 8mg/dl in two reports was labeled as hypocalcaemia and if serum calcium found within normal range (from 8.5 – 10.5mg/dl) within a month it was taken as transient hypocalcaemia. Final assessment was done on follow up at the end of 4th week to label transient hypocalcaemia.

Data was analyzed through SSPS version 20. Mean and standard deviation was calculated for age, weight, duration of disease and serum calcium level. Frequencies and percentages were calculated for gender, and transient hypocalcaemia in both the groups. Chi square test or Fisher exact test was applied to compare transient hypocalcaemia in both the groups. Stratification with respect to age, weight, gender, thyroid disease and duration of disease was done. Post stratification Chi square test applied and p value <0.05 was taken as significant.

RESULTS:

In this study 128 patients were included. Each group had 64 patients. There were 25 male and 39 female in group A while 12 male and 52 female in group B. Mean age of study patients in group A was

Table I: Transient Hypocalcaemia Between Groups

Hypocalcaemia	Group A (n=64)	Group B (n=64)	Total (n=128)	P-Value
Yes	8 (12.5%)	2 (3.1%)	**10 (7.8%)**	0.048
No	56 (87.5%)	62 (96.9%)	**118 (92.2%)**	

Chi-Square=3.905

Table II: Comparison of Transient Hypocalcaemia Between Groups After Stratification By Weight

Weight	Hypocalcaemia	Group A	Group B	P-Value
= 65 kg	Yes No Total	6(17.6%) 28(82.4%) 34	1(2.3%) 42(97.7%) 43	**0.77***
>65kg	Yes No Total	2(6.7%) 28(93.3%) 30	1(4.8%) 20(95.2%) 21	

***Fisher exact test**

Table III: Comparison of Transient Hypocalcaemia Between Groups After Stratification By Duration of Disease

Duration of disease	Hypocalcaemia	Group A	Group B	P-Value
< 7months	Yes No Total	4(10.8%) 33(89.2%) 37	0(0%) 41(100%) 41	**0.046***
>7 months	Yes No Total	4(14.8%) 23(85.2%) 27	2(8.7%) 21(91.3%) 23	**0.67**

***Fisher exact test**

31.94 + 6.63, weight 65.17+9.22, duration of disease in months 7.42 + 3.42 and calcium level 8.70 + .877 while in group B mean age 32.44+6.02, weight 63.55 + 7.24, duration 7.73 + 4.02 and calcium level 8.93+776. Overall frequency of transient hypocalcaemia was 7.8% (10/128). Frequency of hypocalcaemia was significantly high in group A as compared to group B (table I).

Stratification performed with respect to confounding variables. It was found that the rate of transient hypocalcaemia was not significant between groups when we stratified according to age, gender, and thyroid diseases while significant difference was observed between groups in relation to weight below and equal to 65 kg and duration of disease less than and equal to 7months (table II & III).

DISCUSSION:

The aim of surgical treatment in thyroid disease is to eliminate the disorders with low complication rates. Postoperative hypocalcaemia is a common complication following thyroidectomy. It is a reason for prolonged hospital stay after thyroid surgery. Biochemical hypocalcaemia has been reported in as many as 50% of patients. Improvement in surgical technique cannot eliminate the risk of hypocalcaemia, therefore, hypocalcaemia occur even in the hands of the more experienced thyroid surgeons.[13,14] Surgical trauma to parathyroid gland is one of the most frequent causes for hypocalcemia.[15]

In this study patients with multinodular goiter and thyroid cancer were included. It was found in the current study that the gender is not a variable that interfere with calcium homeostasis postoperatively. In contrast other studies showed significantly higher frequency of postoperative hypocalcaemia in women.[16,17]

Over all frequency of transient hypocalcaemia in this study was 7.8%. In a study conducted by Baldassare et al the frequency of hypocalcaemia including all categories of thyroidectomy was 5.5%.[12] In another study it was quite high, being reported as 35%.[18] The overall hypocalcaemia was 23.6% in a study conducted by Krishnan et al.[19] Another study gives a figure of 0-46% as incidence of hypocalcaemia depending on the definition of hypocalcaemia used in the study.[20]

In this study the frequency of hypocalcaemia was significantly high in group A (total thyroidectomy) as compared to group B (near total thyroidectomy hypocalcaemia). Hypocalcaemia after near total thyroidectomy is relatively rare and usually asymptomatic. It resolves in a few days. In our study of the total patients undergoing near total thyroidectomy, two progressed to postoperative hypocalcaemia. In these cases, hypocalcaemia is mostly non-specific and may be associated with hemodilution, hypothermia, hypoalbuminemia, decreased tubular reabsorption of calcium and increased release of calcitonin, which may be observed in other operations.[21]

After total thyroidectomy, the incidence of postoperative transient hypocalcaemia ranges from 8.9% to 53%, with zero to 25% of permanent hypoparathyroidism.[22] In our study it occurred in 8 (12.5%) patients. It was transient hypocalcaemia. The data in this study were similar to the reported literature.[3]

CONCLUSIONS:

The risk of occurrence of hypocalcaemia is more with total thyroidectomy. Meticulous attempts at surgery to preserve the parathyroid glands must be made and prompt diagnosis and treatment can bring down the postoperative morbidity and mortality.

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