CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
http://doi.org/10.5281/zenodo.3723163

Available online at: http://www.iajps.com Research Article

ANALYSIS OF RISK OF SEVER HYPOCALCEMIA AFTER THYROIDECTOMY AMONG LOCAL POPULATION OF PAKISTAN

Muhammad Adil Shahzad[1], Muhammad Tahir Ismail[2], Iqra Qasim[3]

Article Received: January 2020 **Accepted:** February 2020 **Published:** March 2020

Abstract:

Introduction: *Hypocalcemia is one of the major complications of surgical interventions in the central neck (level VI) due to the small size of the parathyroid glands (PGs), their proximity and firm adherence to the thyroid, and the risk of compromising their blood flow during surgery.* ***Aims and objectives:*** *The basic aim of the study is to analyse the risk of sever hypocalcemia after thyroidectomy among local population of Pakistan.* ***Material and methods:*** *This cross sectional study was conducted in health department Punjab during April 2019 to January 2020. During surgery, all or partial thyroid tissue was removed, including the posterior capsule and pyramidal lobe, varying upon patient condition. All parathyroid glands were identified. The serum calcium and parathyroid hormone (PTH) level of patients were tested preoperatively and 48 hours after the operation, respectively.* ***Results:*** *Mean duration of hospital stay was 6.19 days (standard deviation 0.24), including one day prior to surgery. All patients had normal (9.5-75 pg/ml) pre-operative parathyroid hormone and normal calcium levels (8.0-10.4 mg/ dl). A total of 50 (50%) patients developed hypocalcemia (< 8.0 mg/dl) after surgery, of these 24 were symptomatic and 26 asymptomatic. Of the 24 patients who developed symptomatic hypocalcemia, 3 (12.5%) did so on the first day after surgery.* ***Conclusion:*** *It is concluded that postoperative hypocalcemia and hypoparathyroidism incidence were significantly related to the extent of thyroidectomy, gender, lateral lymph node dissection, operative time, and use of CNs.*

Corresponding author:
Muhammad Adil Shahzad,

QR code

Please cite this article in press Muhammad Adil Shahzad et al., ***Analysis Of Risk Of Sever Hypocalcemia After Thyroidectomy Among Local Population Of Pakistan,*** *Indo Am. J. P. Sci, 2020; 07(03).*

INTRODUCTION:

Hypocalcemia is one of the major complications of surgical interventions in the central neck (level VI) due to the small size of the parathyroid glands (PGs), their proximity and firm adherence to the thyroid, and the risk of compromising their blood flow during surgery. Despite the expertise of surgeons, postsurgical hypocalcemia remains a prevalent complication in patients undergoing total thyroidectomy and / or central lymph node dissection, causing high postoperative morbidity and compromising the quality of life and increasing costs to the health system [1].

Some efforts have been made to find, intra and postoperative hypocalcemia predictors in an attempt to prevent and manage it early. Nevertheless, lack algorithms for its prevention, diagnosis and treatment. These algorithms could reduce the number of post-operative admissions to the emergency room, and improve morbidity. Since the 1990s, the incidence of thyroid cancer has increased, faster than any other cancer type in the US [2]. Over the past 3 decades, the incidence of thyroid cancer has increased 240%.Currently, there are 56,780 new thyroid cancer patients in the US. Although the mortality of thyroid cancer is not very high compared with other cancers, there are some subtypes of thyroid cancer that are more aggressive and needed more positive treatment [3].

Surgery and radioiodine therapy are the two main recommended approaches. Thyroidectomy is frequently recommended to patients with thyroid nodules, especially for those in whom thyroid cancer is suspected of carrying thyroid cancer. The completeness of surgical resection helps to improve survival and lower recurrence; thus, most surgeons proposed total thyroidectomy over thyroid lobectomy [4].

However, compared with thyroid lobectomy, there is a higher incidence risk of complications after total thyroidectomy. Complications of these surgical procedures are numerous, and some of them are severe and persistent over time, including hypoparathyroidism, hypocalcemia, vocal paralysis, and hemorrhage. Transient hypocalcemia is one of the most common postoperative complications following thyroid surgery in clinical practice [5].

Aims and objectives

The basic aim of the study is to analyse the risk of sever hypocalcemia after thyroidectomy among local population of Pakistan.

MATERIAL AND METHODS:

This cross sectional study was conducted in health department Punjab during April 2019 to January 2020. During surgery, all or partial thyroid tissue was removed, including the posterior capsule and pyramidal lobe, varying upon patient condition. All parathyroid glands were identified. The serum calcium and parathyroid hormone (PTH) level of patients were tested preoperatively and 48 hours after the operation, respectively. In our hospital, we routinely tested the preoperative PTH in order to exclude postoperative hypocalcemia and hypoparathyroidism. All patients were routinely supplemented with calcium through intravenous injection, and dose adjustment of calcium and appropriate amounts of vitamin D was managed based on clinical symptoms.

Statistical analysis

The data was collected and analysed using SPSS version 19.0.

RESULTS:

Mean duration of hospital stay was 6.19 days (standard deviation 0.24), including one day prior to surgery. All patients had normal (9.5-75 pg/ml) pre-operative parathyroid hormone and normal calcium levels (8.0-10.4 mg/ dl). A total of 50 (50%) patients developed hypocalcemia (< 8.0 mg/dl) after surgery, of these 24 were symptomatic and 26 asymptomatic. Of the 24 patients who developed symptomatic hypocalcemia, 3 (12.5%) did so on the first day after surgery. A total of 24 patients developed symptomatic hypocalcemia, 3 (12.5%) on the first day after surgery, 15 (62.5%) on the second day, 4 (17%) on the third day and one (4%) each on the fourth and fifth days.

Table 01: Distribution of patients according to calcium levels

Appearance of hypocalcemia (start of calcium therapy)	Number (%) of patients with symptomatic hypocalcemia	Number (%) of patients with asymptomatic hypocalcemia
First day	3 (12.5%)	1 (4%)
Second day	15 (62.5%)	8 (31%)
Third day	4 (17%)	7 (26%)
Fourth day	1 (4%)	2 (8%)
Fifth day	1 (4%)	0
No post-op. Ca therapy	0	8 (31%)
Total	24	26

DISCUSSION:

Hypocalcemia and hypoparathyroidism are a frequent complication of thyroidectomy with the growing incidence of thyroid disease. The increased incidence of hypocalcemia in post-thyroidectomy patients may be attributed to hemodilution. Earlier studies also provide various other factors such as age, basic pathology, and duration of surgery as reasons for increased incidence of hypocalcemia. When all glands are compromised by injury of the vascular pedicle, resection or unintended surgical manipulation and sudden significant fall in levels of PTH occur, leading to more intense and faster hypocalcemia, hence causing the symptoms [7]. With partial preservation of the function of the parathyroid glands, the PTH decrease is less significant, remaining so until there is retrieval or repair of the remaining glands of the ischemic parathyroid cells. In such cases, the calcium concentration falls more slowly and with less intensity, lesser possible to cause clinical symptoms [8]. Searching for parathyroid glands may, theoretically, increase the risk of them being injured, being a contributing factor to hypocalcemia [9].

Hypocalcemia occurs secondary to hypoparathyroidism due to trauma, devascularization, or removal of the parathyroid glands that leads to prolonged hospitalization, increased medical cost, and patient discomfort. Therefore, it is necessary to find risk factors for hypocalcemia and hypoparathyroidism following thyroidectomy and to help guide clinical practice [10].

CONCLUSION:

It is concluded that postoperative hypocalcemia and hypoparathyroidism incidence were significantly related to the extent of thyroidectomy, gender, lateral lymph node dissection, operative time, and use of CNs. These findings were crucial for guiding surgeons to prevent the occurrence of hypocalcemia and hypoparathyroidism.

REFERENCES:

1. Lindblom P, Westerdahl J, Bergenfelz A. Low parathyroid hormone levels after thyroid surgery: a feasible predictor of hypocalcemia. Surgery. 2002;131:515–520.
2. Husein M, Hier MP, Al-Abdulhadi K, et al. Predicting calcium status post thyroidectomy with early calcium levels. Otolaryngol Head Neck Surg. 2002;127:289–293.
3. Luu Q, Andersen PE, Adams J, et al. The predictive value of perioperative calcium levels after thyroid/parathyroid surgery. Head Neck. 2002;24:63–67.
4. Bellantone R, Lombardi CP, Raffaelli M, et al. Is routine supplementation therapy (calcium and vitamin D) useful after total thyroidectomy? Surgery. 2002;132:1109–1112.
5. Lombardi CP, Raffaelli M, Princi P, et al. Early prediction of post thyroidectomy hypocalcemia by one single iPTH measurement. Surgery. 2004;136:1236–1241.
6. Rio P, Arcuri MF, Ferreri G, et al. The utility of serum PTH assessment 24 hours after total thyroidectomy. Otolaryngol Head Neck Surg. 2005;32:584–586.
7. Roh JL, Park CI. Intraoperative parathyroid hormone assay for management of patients undergoing total thyroidectomy. Head Neck. 2006;28:990–997.
8. Nahas ZS, Farrag TY, Lin FR, et al. A safe and cost-effective short hospital stay protocol to identify patients at low risk for the development of significant hypocalcemia after total thyroidectomy. Laryngoscope. 2006;116:906–910.
9. Rix TE, Sinha P. Inadvertent parathyroid excision during thyroid surgery. Surgeon. 2006;4:339–342.
10. Asari R, Passler C, Kaczirek K, et al. Hypoparathyroidism after total thyroidectomy: a prospective study. Arch Surg. 2008;143:132–137.