International Journal of Otolaryngology Research 2025; 7(2): 102-107

International Journal of Otolaryngology Research

ISSN Print: 2664-6455
ISSN Online: 2664-6463
Impact Factor (RJIF): 6.21
IJOR 2025; 7(2): 102-107
www.otolaryngologyjournal.in
Received: 14-07-2025
Accepted: 17-08-2025

Md. Shafiqul Islam
Assistant Professor and Head, Department of Otolaryngology-Head and Neck Surgery, Dhaka Central International Medical College & Hospital, 2/1 Ring Road, Shymoli, Dhaka, Bangladesh

SK Nurul Fattah Rumi
Professor & Head (Ex), Department of Otolaryngology and Head-Neck Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh

Md. Rezaul Karim
Assistant Professor, Department of Otolaryngology-Head and Neck Surgery, TMSS Medical College & Rafatullah Community Hospital, Bogura, Bangladesh

Md. Azizul Hoque Manik
Assistant Professor, Department of Otolaryngology and Head-Neck Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh

Md. Mostafizur Rahaman
Assistant Registrar, National Institute of ENT, Tejgaon, Dhaka, Bangladesh

Md. Mozammel Hossen
Registrar, Department of Otolaryngology and Head-Neck Surgery, Dhaka Medical College Hospital, Dhaka, Bangladesh

Mahfujur Rahman
Registrar, Department of Otolaryngology and Head-Neck Surgery, Enam Medical College, Savar, Bangladesh

Md. Nurul Islam
Consultant, Department of Otolaryngology and Head-Neck Surgery, Islami Bank Hospital, Dhaka, Bangladesh

Farhana Sultana
Assistant Registrar, Department of Otolaryngology and Head-Neck Surgery, Delta Medical College & Hospital, Dhaka, Bangladesh

Corresponding Author:
Md. Shafiqul Islam
Assistant Professor and Head, Department of Otolaryngology-Head and Neck Surgery, Dhaka Central International Medical College & Hospital, 2/1 Ring Road, Shymoli, Dhaka, Bangladesh

Immediate post-operative parathyroid hormone assay after total thyroidectomy: A predictive factor for postoperative hypocalcaemia

Md. Shafiqul Islam, SK Nurul Fattah Rumi, Md. Rezaul Karim, Md. Azizul Hoque Manik, Md. Mostafizur Rahaman, Md. Mozammel Hossen, Mahfujur Rahman, Md. Nurul Islam and Farhana Sultana

DOI: https://www.doi.org/10.33545/26646455.2025.v7.i2b.74

Abstract
Background: Postoperative hypocalcaemia is the most common complication following total thyroidectomy, often caused by transient or permanent hypoparathyroidism due to inadvertent parathyroid gland damage. Early identification of patients at risk allows timely calcium supplementation and may facilitate early discharge.
Objective: To find out the prediction of post-operative hypocalcaemia by early PTH assay among the patients undergone total thyroidectomy in DMCH.
Methods: This prospective observational study was conducted at the Department of ENT & Head-Neck Surgery, Dhaka Medical College Hospital (DMCH). Eighty patients undergoing total thyroidectomy were included. Serum intact PTH was measured within one hour postoperatively, and calcium levels were assessed preoperatively, 24, and 48 hours postoperatively. The association between PTH levels and hypocalcaemia was analyzed, and sensitivity, specificity, predictive values, and accuracy were calculated.
Results: The mean age of patients was 41.4±13.96 years with ranged from 18 to 80 years and out of 80 samples male were 7(8.8%) and female were 73(91.2%) with a male to female was 1:10.5. Almost two third (61.3%) of cases were benign and 31(38.8%) malignant. More than one third (38.8%) of patients had ipsilateral enlarged cervical lymph nodes and needed neck dissection. The mean preoperative PTH level was 39.51±21.81 pg/mL, which significantly declined to 16.12±16.34 pg/mL postoperatively (p=0.001). Hypocalcaemia developed in 42.5% of patients at 24 hours and 48 hours postoperatively. Postoperative PTH levels showed significant correlation with hypocalcaemia at 24 hours (p=0.001) and 48 hours (p=0.001). The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of first-hour PTH for predicting hypocalcaemia were 88.9%, 100%, 100%, 89.3%, and 94.2%, respectively.
Conclusion: First hour post-operative Parathyroid hormone assay is more effective to predict early post-operative hypocalcaemia after total thyroidectomy.

Keywords: Total Thyroidectomy, Postoperative Hypocalcaemia, Parathyroid Hormone (PTH), Early PTH Measurement, Calcium Homeostasis, Predictive Biomarker

Introduction
Parathyroid hormone is secreted by the chief cells of the parathyroid glands. It acts to increase the serum calcium concentration in blood. It is one of the main components of calcium homeostasis of the body. Most people have four parathyroid glands but approximately 10% have more than four, while 3% have less than four. A healthy parathyroid gland usually measures on an average usually 1 cm3 and is usually oval, varying in colour from light yellow in older patients to a reddish brown colour in younger ones [1]. During thyroid surgery accidental removal of the parathyroid glands, their damage or de vascularization during resection of thyroid gland and meticulous technique of hemostasis cause insufficient production of Parathyroid hormone (PTH) followed by a drop in calcium level either transient (1.6%- 68%) or permanent (0.4% - 33%) when persisting for more than 6 months [2]. After thyroid surgery, hypocalcaemia occurs usually within 48 hours. Low serum calcium levels may also appear 24 hours after surgery. Symptoms of hypocalcaemia may appear like mild

paraesthesia and tingling to distressing cramps, carpopadal spasms, tetany, convulsions and even death. It is not easy to predict which patients are prone to develop hypocalcaemia and will require oral calcium and or vit -D supplementation and even iv calcium therapy if required for severe symptoms. Symptoms of hypocalcaemia may not manifest for up to four days after surgery and can significantly lengthen hospital stay [3]. Measuring of plasma calcium levels just after thyroid surgery are of little value in predicting the onset of subsequent hypocalcaemia or symptoms because of its relative slow decline. The functional disruption of the parathyroid glands during surgery is thought to be the cause of hypocalcaemia following thyroid surgery. After 10-36% of all thyroidectomies, symptoms of hypocalcaemia are reported, which may need to be treated with intravenous calcium [4, 5]. Traditional management has involved keeping patients in the hospital for two or more postoperative nights to monitor calcium levels or, alternatively, discharging them with prophylactic calcium supplementation, [4, 5] because the onset of hypocalcaemia can be delayed for 1-2 days postoperatively. In another study, Payne *et al.* [6], used a new algorithm of 1st hour post-operative PTH level 8 ng/L for patients at risk of hypocalcaemia. So, the debate comes from these studies whether we should perform PTH assay intra operatively or immediately after surgery. Lombardi *et al.* [7], found that intra operative PTH assay is less accurate in predicting hypocalcaemia and symptoms probably due to the fact that lowest concentration of PTH level is reached with in at least 1 hour of operation. The purpose of this study was to evaluate early PTH measurement post operatively within one hour after total thyroidectomy may identify those patients with the greatest risk of developing symptoms of hypocalcaemia [8]. In our country the exact statistics of incidence and prevalence of post-operative morbidity due to hypocalcaemia following total thyroidectomy is not available. The present study conducted to determine whether parathyroid hormone measurement within one hour postoperatively can predict hypocalcaemia among the patients undergone total thyroidectomy in DMCH which may reflect the picture among the Bangladeshi population. Department of ENT & Head-Neck Surgery is one of the sophisticated department in this Dhaka Medical college and so DMCH is an ideal place.

Methodology

Study design: This will be a prospective observational study.

Place of study: Department of ENT & Head-Neck Surgery at Dhaka Medical College Hospital, Dhaka, Bangladesh

Study period: From October 2021 to December 2022.

Study population: All the patients scheduled for total thyroidectomy in the Department of ENT& Head-Neck Surgery at Dhaka Medical College Hospital, Dhaka during study period were selected as study population.

Sample size A: total number of 80 patients scheduled for total thyroidectomy were enrolled for this study after fulfilling the inclusion and exclusion criteria.

Sample size calculation

Sample size is calculated using the following formula

$$n = \frac{Z^2 p \times q}{d^2}$$

n=80 (targeted sample size)

Selection criteria of the study subjects

Inclusion Criteria

Patients of both benign and malignant thyroid disease of both gender undergo total thyroidectomy.

Exclusion Criteria

- Patients with Graves' disease.
- Patients prepared for completion thyroidectomy.
- Known patients of hypoparathyroidism.
- Patients of chronic renal failure.

Preoperative Assessment

All patients underwent detailed clinical evaluation, routine laboratory investigations, and preoperative serum calcium and intact PTH measurements.

Surgical Procedure

Total thyroidectomy was performed under general anesthesia. In cases with suspicious or confirmed malignancy, ipsilateral or bilateral neck dissection was performed as required. Care was taken to identify and preserve the parathyroid glands and their vascular supply. Surgeries were performed by different surgeons across the department.

Postoperative Assessment

- **PTH Measurement:** Serum intact PTH was measured within 1 hour postoperatively (PTH-1).
- **Calcium Measurement:** Serum calcium levels were measured preoperatively, at 24 hours, and at 48 hours postoperatively.
- Hypocalcaemia was defined as serum calcium <8.5 mg/dL. Symptomatic hypocalcaemia was noted based on clinical manifestations (tingling, cramps, tetany).

Statistical Analysis

Data were analyzed using SPSS version 22. Continuous variables were expressed as mean±standard deviation (SD) and categorical variables as frequency and percentage. Paired t-tests were used to compare pre- and postoperative PTH and calcium levels. The association between postoperative PTH and hypocalcaemia was assessed using the Chi-square test. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of PTH in predicting hypocalcaemia were calculated. A p-value <0.05 was considered statistically significant.

Results

Demographic Profile

The mean age of patients was 41.4±13.96 years (range 18-80 years). Out of 80 patients, 7 (8.8%) were male and 73 (91.2%) were female, giving a male-to-female ratio of 1:10.5 (Table 1).

Diagnosis and Surgical Details

Among the study population, 58.8% had multinodular goiter, 2.5% had Hashimoto's thyroiditis, 28.7% had papillary carcinoma, and 10% had follicular carcinoma. Benign cases comprised 61.3%, and malignant cases 38.8%. Thirty-eight percent of patients underwent neck dissection due to ipsilateral cervical lymph node enlargement (Table 2).

PTH Levels: Preoperative mean PTH was 39.51±21.81 pg/mL (range 8.6-97.1 pg/mL), which significantly decreased to 16.12±16.34 pg/mL (range 3-92 pg/mL) postoperatively (p=0.001) (Table 3). Intraoperative PTH at 20 minutes post-thyroidectomy was 24.92±26.75 pg/mL (range 5-167).
Postoperative PTH categorization showed 43.8% of patients had below-normal PTH (<18.5 pg/mL), while 56.3% had normal PTH (18.5-88 pg/mL) (Table 4).

Calcium Levels: Preoperative mean serum calcium was 9.2±0.9 mg/dL, which decreased to 8.3±0.7 mg/dL at 24 hours and 8.1±0.8 mg/dL at 48 hours postoperatively (p=0.001) (Tables 5 & 6). Hypocalcaemia was observed in 42.5% of patients at 24 hours and 48 hours postoperatively.

Association between Postoperative PTH and Hypocalcaemia: At 24 hours, 82.4% of hypocalcaemic patients had low PTH, while 15.2% of normocalcaemic patients had low PTH. The difference was statistically significant (p=0.001) (Table 7). At 48 hours, 88.9% of hypocalcaemic patients had low PTH, and none of the normocalcaemic patients had low PTH (p=0.001) (Table 8).

Predictive Value of Postoperative PTH

- For 24-hour hypocalcaemia: sensitivity 82.4%, specificity 84.8%, PPV 80.0%, NPV 86.7%, accuracy 83.8%.
- For 48-hour hypocalcaemia: sensitivity 88.9%, specificity 100%, PPV 100%, NPV 89.3%, accuracy 94.2%.
- Intraoperative quick intact PTH at 20 minutes demonstrated sensitivity 92.3%, specificity 83.1%, PPV 60%, NPV 96%, and accuracy 83% for predicting postoperative hypocalcaemia.

Table 1: Demographic Profile of Study Patients (n=80)

Characteristic	Number (%)
Age (years)	41.4±13.96 (18-80)
Gender	
Male	7 (8.8)
Female	73 (91.2)
Male:Female ratio	1:10.5

Table 2: Diagnosis of Study Patients (n=80)

Diagnosis	Number (%)
Multinodular goiter	47 (58.8)
Hashimoto's thyroiditis	2 (2.5)
Papillary carcinoma	23 (28.7)
Follicular carcinoma	8 (10.0)
Benign	49 (61.3)
Malignant	31 (38.8)
Ipsilateral enlarged cervical lymph nodes	31 (38.8)

Table 3: Pre- and Postoperative PTH Levels (pg/mL)

Parameter	Mean ±SD	Range (pg/mL)	p-value
Preoperative PTH	39.51±21.81	8.6 - 97.1	
Postoperative PTH	16.12±16.34	3 - 92	0.001
Intraoperative PTH (20 min)	24.92±26.75	5 - 167	

Table 4: Distribution of Patients According to PTH Levels

PTH Level	Preoperative n (%)	Postoperative n (%)
Below normal (<18.5 pg/mL)	2 (2.5)	35 (43.8)
Normal (18.5-88 pg/mL)	78 (97.5)	45 (56.3)

Table 5: Serum Calcium Levels Pre- and 24 Hours Postoperatively (mg/dL)

Parameter	Mean ±SD	Range (mg/dL)	p-value
Preoperative Ca	9.2±0.9	8.1 - 10.3	
24 hours postoperative Ca	8.3±0.7	-	0.001
Hypocalcaemia (<8.5 mg/dL) at 24 h	34 (42.5%)	-	

Table 6: Serum Calcium Levels at 48 Hours Postoperatively (mg/dL)

Parameter	Mean ±SD	Range (mg/dL)	p-value
48 hours postoperative Ca	8.1±0.8	-	0.001
Hypocalcaemia (<8.5 mg/dL) at 48 h	-	-	

Table 7: Association between Postoperative PTH and Hypocalcaemia at 24 Hours

PTH Level	Hypocalcaemia (n=34)	Normocalcaemia (n=46)	p-value
Below normal (<18.5 pg/mL)	28 (82.4%)	7 (15.2%)	0.001
Normal (18.5-88 pg/mL)	6 (17.6%)	39 (84.8%)	

Table 8: Association between Postoperative PTH and Hypocalcaemia at 48 Hours

PTH Level	Hypocalcaemia (n=32)	Normocalcaemia (n=48)	p-value
Below normal (<18.5 pg/mL)	28 (88.9%)	0 (0%)	0.001
Normal (18.5-88 pg/mL)	4 (11.1%)	48 (100%)	

Table 9: Predictive Value of Postoperative PTH for Hypocalcaemia

Parameter	24 h	48 h
Sensitivity (%)	82.4	88.9
Specificity (%)	84.8	100
Positive Predictive Value (%)	80.0	100
Negative Predictive Value (%)	86.7	89.3
Accuracy (%)	83.8	94.2

Discussion

This prospective observational study was conducted to find out 1st hour serum intact PTH as predictor for post-operative hypocalcaemia following total thyroidectomy. Eighty cases were included in this study. The mean age of patients was 41.4±13.96 years ranged from 18 to 80 years and out of 80 samples male were 7(8.8%) and female were 73(91.2%) with a male to female ratio 1:10.5. Patients were predominately female (75.2%), and the mean age was 48.73±13.44 years [9]. Mean age was 57.8 years and female to male ratio was 9.64:1 as reported in the study of Al Qahtani *et al.* [10]. Mean age was 57.2±13.4 and female to male ratio was 6.81:1 as reported by other investigation [11]. Mean age was 41.78±14.79 (17-72) years and female to male ratio was 2.44:1. Table 2 shows the distribution of study patients by diagnosis. It was observed that more than half (58.8%) of patients had multinodular goiter, 2(2.5%) had Hashimoto's thyroiditis, 23(28.7%) papillary carcinoma and 8(10.0%) follicular carcinoma. Almost two third (61.3%) of cases had benign and 31(38.8%) malignant disease. More than one third (38.8%) of patients had ipsilateral enlarged cervical lymph nodes and needed neck dissection. In the study of Reddy *et al.* [12], multi-nodular was 47 cases, solitary thyroid nodule was 33 cases diffuse goiter was 18 cases and lateral neck mass was 2 cases. In their study, malignant was 42 cases and benign was 58 cases. Table 3 shows that out of 80 patients, pre-operative PTH level was 39.51±21.81 pg/ml with range 8.6 to 97.1 pg/ml and post-operative level was 16.12±16.34 pg/ml with range 3 to 92 pg/ml. Mean PTH level was significantly higher in pre-operative patients than post-operative patients (p=0.001). Intra-operative PTH at 20 min post thyroidectomy (pg/mL) ±SD (range) 24.92±26.75 (5-167). Table 4 shows the distribution of the patients according to pre and post-operative follow up of PTH level. Below normal (<18.5 pg/ml) PTH level was found 2(2.5%) in pre-operative and 35(43.8%) in post-operative period. Normal (18.5-88 pg/ml) PTH level was found 78(97.5%) in pre-operative and 45(56.3%) in post-operative period. In the study of Payne RJ *et al.*[6] patient of total thyroidectomy was parathyroid hormone level on post-operative day 1 was below 10 pg/ml in 19.5%. 10-14 pg/ml in 5.4%, 15-19 pg/ml in 1.6% and >20 pg/ml in 0.3% in cases. The serum calcium level according to pre and 24 hours post-operative calcium level. It was observed that hypo-calcaemia was found 2(2.5%) patients in pre-operative and 34(42.5%) in 24 hrs post-operative calcium level. Mean serum calcium level was found 9.2±0.9 mg/dl in pre-operative and 8.3±0.7 mg/dl in 24 hrs post-operative calcium level. Serum calcium level was significantly decreased in 24 hrs post-operative calcium level (p=0.001). Preoperative serum calcium (mg/dL) ±SD (range) was 9.11±0.54 (8.1-10.30) [12]. Mean serum calcium level was found 8.1±0.8 mg/dl after 48 hours of total thyroidectomy. Serum calcium level was significantly decreased in 48 hours post-operatively (p=0.001) (Table-6). A total of 304 eligible thyroid procedures during the study period were identified. In 68 patients (22.4%), mild hypocalcemia developed postoperatively. In 91 patients (29.9%), significant postoperative hypocalcemia occurred; of these, 87 (96%) had at least one serum calcium level below 8.0 mg/dL and 22 (24%) experienced symptoms associated with hypocalcemia [13]. Table 7 shows the association between post-operative parathyroid hormone level with after 24 hours serum calcium level. It was observed that majority (82.4%) of patients had hypoparathyroidism in hypocalcaemia group and 7(15.2%) in normal group. The difference was statistically significant between two groups (p=0.001). Thirteen patients (24.5%) showed normal values of calcium 24 h after thyroidectomy despite reduced levels of PTH [9]. Table 8 shows the association between post-operative parathyroid hormone level with after 48 hours serum calcium level. It was observed that majority (88.9%) of patients had hypoparathyroidism in hypocalcaemia group and no one found in normal group. The difference was statistically significant between two groups (p=0.001). After 48 h, all patients with a decreased PTH after surgery had low calcium [9]. The validity of post-operative hypocalcaemia was correlated by calculating sensitivity, specificity, accuracy, positive and negative predictive values. Sensitivity, specificity, accuracy, PPV and NPV of serum PTH were 82.4%, 84.8%, 83.8%, 80.0% and 86.7% respectively for the prediction of hypocalcemia after 24 hours. Sensitivity, specificity, accuracy, PPV and NPV of serum PTH were 88.9%, 100.0%, 94.2%, 100.0% and 89.3% respectively for the prediction of hypocalcemia after 48 hours. Sensitivity, specificity, PPV, NPV and accuracy of quick intact PTH 20 min were 92.3%, 83.1%, 60.0%, 96.0% and 83.0% respectively for the prediction of hypocalcemia after postoperative clinical hypocalcaemia [12]. Their study demonstrated that PTH-1, PTH-6, and PTH-24 assays are good predictors of hypocalcemia 24 hours' post-thyroidectomy. A PTH-1 assay alone is predictive of the development of postoperative hypocalcemia at 24 hours, with a sensitivity of 89% and an NPV of 97%. Practically, it was found no significant advantage in determining PTH-6 and PTH-24 in asymptomatic patients with a PTH-1 greater than

1.5 pmol/L [10]. Sensitivity, specificity, NPV, PPV and accuracy of quick intact PTH 20 min were 89%, 100%, 97% and 100.0% respectively for PTH-1 measurement comparing Ca24 and hypocalcemia [10]. Postoperative PTH levels have been reported by numerous studies to be reliable early predictors of patients at low risk of hypocalcaemia, who are hence suitable for early discharge [14]. Among published studies, the timing of PTH measurement after surgery varies, ranging from intraoperative [12, 15], early (1-4 h) [16, 17], 6 h [18, 19], or next day [20, 21]. However, not all authors are in agreement that a single postoperative PTH determination level is sufficient to exclude significant hypocalcaemia. In one of the largest published series, Lombardi reported a threshold 4-h PTH level of 10 pg/ml to have too high a high false negative to allow safe early discharge [7], while Sahli reported 1-h PTH levels to not accurately predict patients at risk of hypocalcaemia [22]. Simultaneous assessment of both early calcium and PTH levels has been suggested as being more accurate [18], while Pisanu reported that combined measurement of 6-h PTH levels and POD1 calcium levels gave the best predictive outcome [19].

Conclusion

A standardized PTH protocol for the prevention of hypocalcemia following total thyroidectomy is highly efficacious. It is possible to minimize number of postoperative symptomatic hypocalcaemia. Measurement of serum PTH level within 1 hour after total thyroidectomy can accurately identify the patients those likely to develop hypocalcaemia. It allows more timely initiation of calcium supplement (instead for waiting to become symptomatic) and potentiate for early discharge. Because of high sensitivity, specificity, accuracy positive and negative predictive value, 1 hour/immediate postoperative serum PTH can be used as a predictor of hypocalcaemia after total thyroidectomy. 1st hour post-operative Parathyroid hormone assay is more effective to predict early post-operative hypocalcaemia after total thyroidectomy.

Limitations

1. Single-center observational study; observer bias could not be completely eliminated.
2. Purposive sampling was used; random sampling would provide more generalizable evidence.
3. Small sample size (n=80) limits the statistical power; a larger cohort would strengthen findings.
4. Follow-up period was short; longer follow-up could better assess persistent hypocalcaemia.
5. Only a single postoperative PTH measurement was taken; serial measurements could provide more informative trends.
6. Surgeries were performed by different surgeons, introducing variability; uniform surgical expertise would improve consistency.
7. Only total serum calcium was measured; ionized calcium measurement may provide more accurate assessment.
8. Symptomatic correlation with biochemical hypocalcaemia was limited; integrating clinical symptoms would enhance applicability.

Recommendations

1. Conduct multicenter studies with larger populations for more generalizable data.
2. Increase sample size to improve statistical validity and reliability.
3. Consider multiple postoperative PTH and calcium measurements to better monitor trends.
4. Standardize surgical procedures with a single experienced surgeon or team to reduce variability.
5. Measure both total and ionized calcium for more accurate assessment of calcium status.
6. Include systematic correlation of biochemical values with clinical symptoms for improved patient management.

References

1. Watkinson JC, Clarke RW, editors. Scott-Brown's Otorhinolaryngology and Head and Neck Surgery: Basic Sciences, Endocrine Surgery, Rhinology. 8th ed. CRC Press; 2018.
2. Pattou F, Combemale F, Fabre S, Carnaille B, Decoulx M, Wemeau JL, *et al.* Hypocalcemia following thyroid surgery: incidence and prediction of outcome. World J Surg. 1998;22(7):718-724.
3. Bozec A, Guevara N, Bailleux S, Castillo L, Santini J. Early PTH assay after total thyroidectomy: predictive factor for postoperative hypocalcemia? Rev Laryngol Otol Rhinol (Bord). 2006;127(3):141-144.
4. Brophy C, Woods R, Murphy MS, Sheahan P. Perioperative magnesium levels in total thyroidectomy and relationship to hypocalcemia. Head Neck. 2019;41(6):1713-1718.
5. Del Rio P, Arcuri MF, Ferreri G, Sommaruga L, Sianesi M. The utility of serum PTH assessment 24 hours after total thyroidectomy. Otolaryngol Head Neck Surg. 2005;132(4):584-586.
6. Payne RJ, Tewfik MA, Hier MP, Tamilia M, Namara EM, Young J, *et al.* Benefits resulting from 1- and 6-hour parathyroid hormone and calcium levels after thyroidectomy. Otolaryngol Head Neck Surg. 2005;133(3):386-390.
7. Lombardi CP, Raffaelli M, Princi P, Santini S, Boscherini M, De Crea C, *et al.* Early prediction of postthyroidectomy hypocalcemia by one single iPTH measurement. Surgery. 2004;136(6):1236-1241.
8. Vanderlei FAB, Vieira JGH, Hojaij FC, Cervantes O, Kunii IS, Ohe MN, *et al.* Parathyroid hormone: an early predictor of symptomatic hypocalcemia after total thyroidectomy. Arq Bras Endocrinol Metabol. 2012;56:168-172.
9. Metere A, Biancucci A, Natili A, Intini G, Graves CE. PTH after thyroidectomy as a predictor of post-operative hypocalcemia. Diagnostics (Basel). 2021;11(9):1733.
10. Al Qahtani A, Parsyan A, Payne R, Tabah R. Parathyroid hormone levels 1 hour after thyroidectomy: an early predictor of postoperative hypocalcemia. Can J Surg. 2014;57(4):237.
11. Eismontas V, Slepavicius A, Janusonis V, Zeromskas P, Beisa V, Strupas K, *et al.* Predictors of postoperative hypocalcemia occurring after a total thyroidectomy: results of prospective multicenter study. BMC Surg. 2018;18(1):1-12.
12. Reddy AC, Chand G, Sabaretnam M, Mishra A, Agarwal G, Agarwal A, *et al.* Prospective evaluation of intra-operative quick parathyroid hormone assay as an early predictor of post thyroidectomy hypocalcemia. Int J Surg. 2016;34:103-108.
13. Noureldine SI, Genther DJ, Lopez M, Agrawal N, Tufano RP. Early predictors of hypocalcemia after total thyroidectomy: an analysis of 304 patients using a short-

stay monitoring protocol. JAMA Otolaryngol Head Neck Surg. 2014;140(11):1006-13.
14. AES Guidelines 06/01 Group. Australian Endocrine Surgeons Guidelines AES06/01: Postoperative parathyroid hormone measurement and early discharge after total thyroidectomy. Analysis of Australian data and management recommendations. ANZ J Surg. 2007;77(4):199-202.
15. Lang BH, Yih PC, Ng KK. A prospective evaluation of quick intraoperative parathyroid hormone assay at the time of skin closure in predicting clinically relevant hypocalcemia after thyroidectomy. World J Surg. 2012;36(6):1300-1306.
16. Vescan A, Witterick I, Freeman J. Parathyroid hormone as a predictor of hypocalcemia after thyroidectomy. Laryngoscope. 2005;115(12):2105-2108.
17. Puzziello A, Rosato L, Innaro N, Orlando G, Avenia N, Perigli G, *et al.* Hypocalcemia following thyroid surgery: incidence and risk factors. A longitudinal multicenter study comprising 2,631 patients. Endocrine. 2014;47(2):537-542.
18. Jumaily JS, Noordzij JP, Dukas AG, Lee SL, Bernet VJ, Payne RJ, *et al.* Prediction of hypocalcemia after using 1- to 6-hour postoperative parathyroid hormone and calcium levels: an analysis of pooled individual patient data from 3 observational studies. Head Neck. 2010;32(4):427-434.
19. Saba A, Podda M, Messina Campanella A, Pisanu A. Early prediction of hypocalcemia following thyroid surgery: a prospective randomized clinical trial. Langenbecks Arch Surg. 2017;402(7):1119-1125.
20. Cayo AK, Yen TW, Misustin SM, Wall K, Wilson SD, Evans DB, *et al.* Predicting the need for calcium and calcitriol supplementation after total thyroidectomy: results of a prospective, randomized study. Surgery. 2012;152(6):1059-1067.
21. Karatzanis AD, Ierodiakonou DP, Fountakis ES, Velegrakis SG, Doulaptsi MV, Prokopakis EP, *et al.* Postoperative day 1 levels of parathyroid as predictor of occurrence and severity of hypocalcaemia after total thyroidectomy. Head Neck. 2018;40(5):1040-1045.
22. Sahli Z, Najafian A, Kahan S, Schneider EB, Zeiger MA, Mathur A. One-hour postoperative parathyroid hormone levels do not reliably predict hypocalcemia after thyroidectomy. World J Surg. 2018;42(7):2128-2133.

How to Cite This Article
Islam MS, Rumi SNF, Karim MR, Manik MAH, Rahaman MM, Hossen MM *et al*. Immediate post-operative parathyroid hormone assay after total thyroidectomy: A predictive factor for postoperative hypocalcaemia. International Journal of Otolaryngology Research. 2025;7(2):102-107.