

Demographical Variations And Outcomes In Patients Undergoing Thyroid Surgery Having Palpable Thyroid Gland

MUHAMMAD IMRAN BHATTI¹, SAAD ABDUR REHMAN AFAQUE², MUHAMMAD RAZZAQ DOGAR³, ZUBAIR ANWAR⁴, ABDUL WAHEED⁵, TATHEER SYED⁶, ADNAN ANWAR⁷

¹ Senior Registrar, Department of ENT, Head and Neck Surgery, Liaquat University of Medical and Health Science, Jamshoro

² Senior Registrar, Department of ENT, Jinnah Medical and Dental College, Karachi

³ Professor, Department of ENT, Head and Neck Surgery, Jinnah Postgraduate Medical Centre, Karachi

⁴ Assistant Professor, Department of ENT, Head and Neck Surgery, Jinnah Postgraduate Medical Centre, Karachi

⁵ Associate professor, Department of ENT, Head and Neck Surgery, Sir Syed College of Medical Sciences for Girls, Karachi

⁶ BDS, MSPH, Appna Institute of Public Health, Jinnah Sindh Medical University, Karachi

⁷ Associate Professor of Physiology, Hamdard College of Medicine and Dentistry, Karachi

Corresponding Author:

Muhammad Razzaq Dogar

Professor, Department of ENT, Head and Neck Surgery, Jinnah Postgraduate Medical Centre Karachi

Email: dogarent1@gmail.com

DOI: 10.47750/pnr.2023.14.04.74

Abstract

Objective: To determine the demographical variations and outcomes of patients undergoing thyroid surgery having a palpable thyroid gland.

Study design and setting: Observational cross-sectional, Department of ENT, Jinnah Postgraduate Medical Center, Karachi.

Methodology: After ethical approval, patients were selected from ENT wards and OPDs. Patients with palpable thyroid gland undergoing thyroid surgery were included and were discharged 48–72 hours postoperatively. All patients had their vocal cords checked at time of extubation. On follow-up visit at day 5, final diagnosis of outcomes/complications was assessed. For data analysis, SPSS v23.0 was used. Cross tabulation was done with demographics and outcome of surgery to see effect of these on outcome variables by applying chi square test. A p-value ≤ 0.05 was taken as significant.

Results: From total 157 patients with palpable thyroid gland, mean age of patients was 39.8 ± 12.2 years. Total 112 (71.3%) were males and 45 (28.7%) were females. 47 (29.9%) were between 18-30 years, 57 (36.3%) between 31-45 years while 53 (33.8%) were >45 years of age. 72 (45.9%) had disease duration of <3 years while 85 (54.1%) >3 years. Regarding outcomes, 14 (8.9%) had hypoparathyroidism, while, 72 (45.9%), 40 (25.5%), 16 (10.2%) and 15 (9.6%) had hypothyroidism, hyperthyroidism, RLN paralysis and airway obstruction with insignificant demographical differences respectively.

Conclusion: Demographical variations do not play a substantial role in determining the outcome of patients undergoing thyroid surgery for palpable thyroid gland.

Keywords: Thyroidectomy, Post-thyroid Surgery Outcomes, Diabetes Mellitus, Hyperthyroidism, Hypothyroidism

INTRODUCTION

Thyroid surgery is a common procedure performed worldwide for the treatment of various thyroid disorders, including thyroid nodules, goiter, and thyroid cancer (1). The palpable thyroid gland is a significant clinical finding that often prompts further investigation and consideration for surgical intervention (2). However, the outcomes of thyroid

surgery in patients with palpable thyroid glands may vary based on demographic factors such as age, gender, and ethnicity (3). Understanding these demographic variations and their impact on surgical outcomes is crucial for optimizing patient care and improving clinical decision-making (4).

Demographic factors can influence the presentation, management, and outcomes of thyroid surgery. Age, for instance, plays a pivotal role in the prevalence and nature of thyroid diseases. The incidence of thyroid nodules increases with age, with a higher prevalence observed in older individuals (5). Moreover, the risk of thyroid cancer also rises with advancing age (6). Therefore, studying the demographic variations in patients with palpable thyroid glands undergoing surgery becomes imperative to tailor treatment strategies and optimize surgical outcomes based on age-related considerations (7).

Gender is another important demographic factor that may impact thyroid surgery outcomes. Thyroid disorders, including palpable thyroid glands, are more common in women compared to men, suggesting potential gender-related differences in disease characteristics and surgical outcomes (8). Hormonal factors, genetic predispositions, and variations in disease presentation between genders may contribute to divergent surgical outcomes in female and male patients (9). Investigating these gender-based variations is essential for developing gender-specific management strategies and achieving optimal outcomes in thyroid surgery (10).

Ethnicity and race are additional demographic factors that can influence the presentation and outcomes of thyroid surgery (11). Studies have shown variations in the prevalence of thyroid diseases across different ethnic groups. For example, certain ethnic populations, such as Asians, have a higher incidence of thyroid nodules and thyroid cancer (12). These variations may be attributed to genetic factors, environmental influences, or disparities in healthcare access and utilization (13). Understanding the demographic variations in thyroid surgery outcomes among different ethnic groups can help identify potential health disparities and guide the development of tailored approaches to improve outcomes for diverse populations (14).

In addition to demographic factors, other clinical factors such as the size and characteristics of the palpable thyroid gland, presence of nodules, and histopathological findings are essential considerations in thyroid surgery (15). The demographic variations in these clinical factors may influence the surgical approach, extent of resection, and postoperative outcomes (16). Therefore, comprehensively understanding the interactions between demographic variations and clinical factors is crucial for individualized patient management and optimizing surgical outcomes (17).

To date, limited research has specifically focused on the demographic variations and outcomes in patients undergoing thyroid surgery with palpable thyroid glands. A comprehensive understanding of these variations and their impact on surgical outcomes is vital for enhancing patient care, improving surgical decision-making, and tailoring treatment strategies (18). This study aims to investigate the demographic variations and outcomes in patients undergoing thyroid surgery with palpable thyroid glands, including age-related differences, gender-based disparities, and associated outcomes. By analyzing these demographic factors and their associations with clinical factors and surgical outcomes, this study aims to provide valuable insights into optimizing patient management and achieving improved outcomes in thyroid surgery.

METHODOLOGY

This study was an observational cross sectional done at the Department of ENT, Jinnah Post-Graduate Medical Center, Karachi using non-probability consecutive sampling method. Duration of study was six months after approval of research proposal, from March to August 2022. The calculation of sample size was done using Epi Info-7 by keeping hyperthyroidism prevalence (with least proportion) post-thyroidectomy period at 07 %, 95 % confidence interval and 4.4 % margin of error, sample size calculated was 157.

Patients between ages of 18-60 years of either gender diagnosed with a palpable thyroid gland minimum for six months and underwent any thyroid surgery viz., isthmusectomy, lobectomy, subtotal or near or total thyroidectomy were included in the study while patients having past history of thyroid surgery, or thyroid irradiation therapy currently ongoing or past history and prior paralysis of vocal cords (which was diagnosed through pre-operative indirect laryngoscopy) were excluded from the research.

Data Collection Procedure

After Ethical Review Committee of JPMC provided the ethical approval for the study and subsequently taking informed consent from the patients, data collection process began. Patients were included ENT wards and OPDs of JPMC, Karachi in accordance with inclusion and exclusion criterion. ENT surgeon with minimum of five years' surgical experience performed the surgeries.

Thyroid surgery was carried out by collar incision of two finger breadths above sternal notch and then to thyroid cartilage, sub-platysmal flaps were raised. In patients having large goiter strap muscles were divided. Ligation of middle thyroid veins was done and then divided whenever found. Superior thyroid pedicle was ligated individually and then divided viz. downward retraction and lateral identification of superior laryngeal nerve's external branch.

Recurrent Laryngeal Nerve (RLN) was identified above level of inferior thyroid artery and ligation of inferior thyroid artery in continuity. Neck drainage was done using suction drain as per requirement. Post-operatively, patients were discharged after 48-72 hours. Vocal cords of each patient were thoroughly checked before extubation.

Serum calcium was checked in each patient on day of surgery and also after two subsequent days. Other investigations carried out were thyroid function tests, ultrasound and thyroid scans along with Fine Needle Aspiration Cytology (FNAC). On 5th follow up day, final examination and recording of complications was done as per complaint of patient along with thorough examination.

Data Analysis Procedure

For analysis of data, SPSS v23.0 was used. For quantitative variables, such as age and duration of disease mean and standard deviation were reported and for qualitative variables like gender, family history, surgery type along with outcome variables (complications), frequency and percentages were recorded. To test for differences between demographics and outcome variables, chi square test was applied. P-value of 0.05 was kept as statistically significant.

RESULTS

Out of 157 patients included, with mean age 39.8 ± 12.2 years. 45 (28.7 %) of the patients were females while 112 (71.3 %) of patients were males. 53 (33.8 %) of included patients were >45 years of age, while 47 (29.9 %) of patients were in-between 18-30 years of age and 57 (36.3 %) patients were in-between 31-45 years of age. 72 (45.9%) patients had duration of disease <3 years while 85 (54.1%) had duration of disease >3 years. 25 (15.9%) of patients had a positive family history of thyroid disease. 11 (7%) of patients were diabetic. 62 (39.5 %) patients underwent total thyroidectomy, 48 (30.6 %) subtotal thyroidectomy, 18 (11.5 %) of patients underwent lobectomy, 15 (9.6 %) isthmusectomy and 14 (8.9 %) near total thyroidectomy.

In terms of complications, 14 (8.9 %) of patients were found to have hypoparathyroidism, 72 (45.9%) hypothyroidism, 40 (25.5%) hyperthyroidism, 16 (10.2%) RLN paralysis and 15 (9.6 %) airway obstruction.

With regards to post-operative complications with respect to gender, Hypoparathyroidism was reported in 10 (8.9%) males and 04 (8.9%) females with an insignificant p-value of 0.321. 50 (44.6%) males and 22 (48.9%) females were found to have hypothyroidism with an insignificant p-value of 0.712. 33 (29.5%) males and 07 (15.6%) females

reported hyperthyroidism with an insignificant p-value of 0.075. RLN paralysis was observed in 12 (10.7%) males while in 08 (17.8%) females with an insignificant p-value of 0.235. Airway obstruction was found in 07 (6.3%) males and 08 (17.8%) females with an insignificant p-value of 0.064.

With regards to post-operative complications with respect to age, Hypoparathyroidism was reported in 06 (12.8%) patients between 18-30 years, in 05 (8.8%) patients 31-45 years and 03 (5.7%) >45 years of age with an insignificant p-value of 0.324. 22 (46.8%) patients between 18-30 years, 24 (42.1%) patients 31-45 years and 26 (49.1%) >45 years were found to have hypothyroidism with an insignificant p-value of 0.135. 09 (19.1%) 18-30 years, 15 (26.3%) 31-45 years and 16 (30.2%) >45 years of age reported hyperthyroidism with an insignificant p-value of 0.121. RLN paralysis was observed in 03 (6.4%) patients between 18-30 years, while in 09 (15.8%) patients between 31-45 years while in 04 (7.5%) patients >45 years with an insignificant p-value of 0.212. Airway obstruction was found in 07 (14.9%) patients between 18-30 years, 04 (7%) patients between 31-45 years and in 04 (7.5%) patients >45 years of age with an insignificant p-value of 0.119.

Table I: Demographical distribution of study patients (n=157)

Variables		Mean ± SD / Frequency (%)
Mean age (years)		39.8 ± 12.2
Age groups	18-30 years	47 (29.9 %)
	31-45 years	57 (36.3 %)
	>45 years	53 (33.8 %)
Gender	Male	112 (71.3 %)
	Female	45 (28.7 %)
Duration of Disease	<3 years	72 (45.9%)
	>3 years	85 (54.1 %)
Family History	Yes	25 (15.9 %)
	No	132 (84.1%)
Diabetes Mellitus	Yes	11 (7.0 %)
	No	146 (93 %)

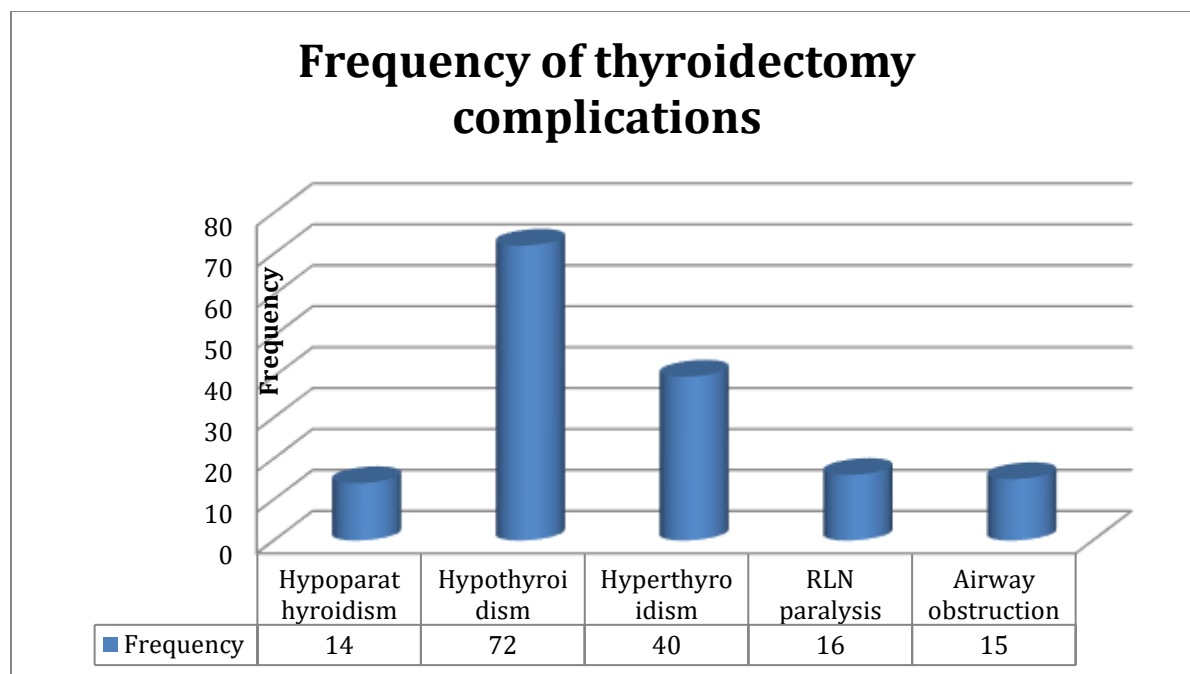


Figure I: Graphical representation of frequency of complication due to thyroid surgery (n=157)

Table II: Stratification of outcomes of thyroid surgery with gender (n=157)

Outcome /Complication	Gender		p-value
	Male	Female	
Hypoparathyroidism	10 (8.9%)	04 (8.9%)	0.321
Hypothyroidism	50 (44.6%)	22 (48.9%)	0.712
Hyperthyroidism	33 (29.5%)	07 (15.6%)	0.075
Right Laryngeal Nerve Paralysis	12(10.7%)	04 (8.9%)	0.235
Airway Obstruction	07 (6.3%)	08 (17.8%)	0.064

Table III: Stratification of outcomes of thyroid surgery with age (n=157)

Outcome /Complication	Age Groups			p-value
	18-30 years	31-45 years	>45 years	
Hypoparathyroidism	6 (12.8%)	5 (8.8%)	3 (5.7%)	0.324
Hypothyroidism	22 (46.8%)	24 (42.1%)	26 (49.1%)	0.135
Hyperthyroidism	9 (19.1%)	15 (26.3%)	16 (30.2%)	0.121
Right Laryngeal Nerve Paralysis	3 (6.4%)	9 (15.8%)	4 (7.5%)	0.212
Airway Obstruction	7 (14.9%)	4 (7%)	4 (7.5%)	0.119

DISCUSSION

The results of this research presented that demographics such as age, gender did not have any significance or inclination towards male or females, nor with respect to the age groups.

Age is a significant demographic factor that affects the prevalence and nature of thyroid diseases. The incidence of thyroid nodules and thyroid cancer increases with age, with a higher prevalence observed in older individuals (19). Several studies have shown that older age is associated with a higher risk of complications following thyroid surgery, including postoperative hypocalcemia and recurrent laryngeal nerve injury (20). Advanced age has also been associated with increased morbidity and mortality rates. Therefore, age-related considerations are important in the management of patients undergoing thyroid surgery with palpable thyroid glands (21, 22).

Gender is another important demographic factor that may impact thyroid surgery outcomes. Thyroid disorders, including palpable thyroid glands, are more common in women compared to men (23). Women have a higher prevalence of thyroid nodules, goiter, and autoimmune thyroid diseases. Studies have reported gender-related differences in the surgical management and outcomes of thyroid surgery (24). For example, women tend to undergo more thyroid surgeries and have a higher incidence of postoperative complications, such as hypoparathyroidism and wound infections. Understanding these gender-based variations can help develop tailored strategies to optimize surgical outcomes in patients with palpable thyroid glands (25).

In addition to demographic factors, clinical factors associated with palpable thyroid glands, such as the size and characteristics of the thyroid gland, presence of nodules, can impact surgical outcomes (26). The size of the thyroid gland and the presence of nodules can affect the complexity of the surgical procedure and the risk of complications (27). Patients with larger thyroid glands may have a higher risk of postoperative hematoma or airway compromise (28).

CONCLUSION

Demographical variations do not play a substantial role in determining the outcome of patients undergoing thyroid surgery for palpable thyroid gland. However, more extensive and multi-centered studies with greater sample size would be enlightening to the findings observed in this study.

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