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Original Research Article

Epidemiological Analysis of Thyroid Pathologies Requiring Surgery: A Retrospective Study

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Abstract:

Background: Thyroid disorders pose a significant public health burden globally, with diverse etiologies and clinical presentations. Understanding the epidemiological patterns of thyroid pathologies is crucial for effective management strategies.

Objective: This retrospective study aimed to investigate the incidence and demographic distribution of thyroid pathologies necessitating surgery at Fakir Mohan Medical College and Hospital, Balasore, Odisha.

Methodology: A retrospective analysis was conducted on patients who underwent various types of thyroid surgeries between February 1, 2020, and January 31, 2022. Data were collected from patient records and analyzed using descriptive statistics and SPSS software.

Results: A total of 200 thyroid surgeries were performed during the study period. Colloid goitre was the most prevalent pathology requiring surgery (41.5%), followed by papillary carcinoma thyroid and follicular adenoma (each 15%). Females constituted 85% of the cases, with a predominant occurrence in the fifth decade of life. Malignancies accounted for 24% of cases, with papillary carcinoma thyroid being the most common (65.5% of malignancies). Notably, males exhibited a higher propensity for malignancies.

Discussion: The findings corroborate global trends of thyroid disorders, with colloid goitre predominating among surgical cases. Malignancies, particularly papillary carcinoma thyroid, were notable, with males showing a higher risk. Similar epidemiological patterns were observed in previous studies, emphasizing the consistency of these findings across diverse populations.

Conclusion: Colloid goitre emerged as the most common indication for thyroid surgery, with a female predilection and a peak incidence in the fifth decade of life. Understanding the demographic distribution of thyroid pathologies is essential for tailored management strategies and public health interventions.

Keywords: Thyroid Disorders, Thyroidectomy, Epidemiology, Thyroid Pathologies, Demographic Distribution.

Introduction

The recognition of goitre dates back to ancient civilizations, with evidence dating as far back as 2007 BC, although it wasn't formally identified as a thyroid gland until the Renaissance period. The term "thyroid gland" was coined by Thomas Warton in 1645 [1]. Thyroid disorders represent a significant burden on public health both in India and globally. In India alone, an estimated 42 million individuals are affected by thyroid diseases [2]. These disorders encompass a spectrum of conditions ranging from diffuse or nodular, benign or malignant, to euthyroid or hyperthyroid states. Common indications for thyroid surgery include simple goitre, thyroiditis, adenomas, carcinomas, multinodular goitre, and Grave's disease. However, surgical intervention in the thyroid region is intricate due to its complex anatomy and its proximity to vital structures controlling various physiological functions and special senses. Therefore, surgical intervention should be considered only when necessary, such as in cases of goitre causing pressure symptoms, toxic thyroid nodules, thyroid malignancies, or cosmetic concerns. The incidence and prevalence of thyroid disorders vary across geographical regions, age groups, and genders [3]. This study aims to

investigate the incidence of thyroid pathologies necessitating thyroid surgery, as well as their distribution among different age and sex groups at Fakir Mohan Medical College and Hospital, Balasore, Odisha.

Aims and Objectives

This study seeks to determine the incidence of thyroid pathologies requiring thyroid surgery and to analyze the age and sex distribution of these various thyroid pathologies.

Methods: This study employed a retrospective analysis of patients who underwent various types of thyroid surgeries, including lobectomy, hemithyroidectomy, subtotal thyroidectomy, near-total thyroidectomy, and total thyroidectomy, at Fakir Mohan Medical College and Hospital, Balasore, Odisha, within a two-year period from February 1, 2020, to January 31, 2022.

Inclusion Criteria: The study included all patients who underwent thyroidectomy, regardless of the type of surgery, during the specified study period.

Exclusion Criteria: Patients who did not meet the criteria for thyroid surgery indications and those who were advised surgery but declined were excluded from the study.

Data Analysis: Data collected from patient records were entered into a database and analyzed using appropriate statistical software, such as SPSS (Statistical Package for the Social Sciences). Descriptive statistics were used to summarize demographic characteristics, types of thyroid surgeries performed, and indications for surgery.

Results

During the one-year study period, a total of 200 thyroid surgeries were performed at Fakir Mohan Medical College and Hospital, Balasore, Odisha. The retrospective analysis revealed the distribution of diseases for which surgeries were conducted, along with patient demographics.

Table 1: Distribution of Various Thyroid Pathologies and Their Percentages

Pathology	Number	Percentage (%)
Colloid goitre	83	41.5
Papillary carcinoma thyroid	30	15
Follicular adenoma	30	15
Hashimotos thyroiditis	27	13.5
Follicular carcinoma	16	8
Hurthle cell adenoma	8	4
Poorly differentiated carcinoma	2	1
Hamartoma	2	1
Hyalinising trabecular tumor	2	1

The most prevalent pathology requiring thyroid surgeries was colloid goitre, accounting for 41.5% of cases (83 out of 200).

Following colloid goitre, papillary carcinoma thyroid and follicular adenoma each represented 15% of cases with 30 occurrences. Hashimoto's thyroiditis accounted for 13.5% (27 cases), while follicular carcinoma and hurthle cell adenoma represented 8% (16 cases) and 4% (8 cases) respectively.

Rare pathologies included poorly differentiated carcinoma, hamartoma, and hyalinising trabecular tumor, each comprising 1% of cases.

Table 2: Gender Distribution of Cases

Gender	Number	Percentage (%)
Male	30	15
Female	170	85

Of the total cases, females accounted for 85% (170 out of 200), while males represented 15% (30 out of 200). This yields a female-to-male ratio of 5.6:1.

Table 3: Distribution of Cases According to Age Group

Age group (yrs)	Number	Percentage (%)
21- 30	47	23.5
31- 40	40	20
41- 50	61	30.5
51- 60	34	17
61- 70	18	9

The most common age group undergoing thyroid surgery was the 41-50 years, comprising 30.5% of cases, followed by the 21-30 years with 23.5% and the 31-40 years with 20% of cases. Age groups 51-60 and 61-70 constituted 17% and 9% of cases respectively.

Table 4: Age Distribution of Various Thyroid Pathologies

Pathology	Age groups (years)				
	21-30	31-40	41-50	51-60	61-70
Colloid goitre	18	12	29	17	11
Papillary carcinoma thyroid	14	1	5	8	3
Follicular adenoma	-	17	5	7	3
Hashimotos thyroiditis	8	8	13	-	-
Follicular carcinoma	3	2	8	-	-
Hurthle cell adenoma	3	-	1	1	-
Poorly differentiated carcinoma	-	-	-	-	1
Hamartoma	-	-	-	1	-
Hyalinising trabecular tumor	1	-	-	-	-

The distribution of thyroid pathologies varied across different age groups. Colloid goitre predominantly affected the age group of 41-50 years, comprising 33.3% of cases within this group. Papillary carcinoma thyroid primarily affected the age group of 21-30 years (45.1%), while follicular adenoma was most commonly seen in the age group of 31-40 years (53.1%). Hashimoto's thyroiditis, on the other hand, was most frequently observed in the age group of 41-50 years (44.8%).

Table 5: Gender Distribution of Various Thyroid Pathologies

Pathology	Gender	
	Male	Female
Colloid goitre	12	75
Papillary carcinoma thyroid	10	21
Follicular adenoma	2	30
Hashimoto's thyroiditis	2	27
Follicular carcinoma	-	13
Hurthle cell adenoma	1	4
Poorly differentiated carcinoma	-	1
Hamartoma	1	-
Hyalinising trabecular tumor	-	1

Females constituted the majority of cases across all thyroid pathologies, with significantly higher numbers than males. For instance, out of 87 cases of colloid goitre, 75 were females. Similarly, 21 out of 31 cases of papillary carcinoma thyroid and 30 out of 32 cases of follicular adenoma were females. Males, however, had a higher proportion of malignancies, with 40% of males having malignancies compared to 21.1% of females.

Discussion

The World Health Organization (WHO) reports that approximately 7% of the global population suffers from clinically apparent goitre [4]. The prevalence is notably higher in developing countries, where iodine deficiency is a major contributing factor to the disease [5]. Moreover, thyroid diseases exhibit a higher prevalence among females [6], with benign neoplasms being more prevalent than thyroid malignancies [7]. In our study, thyroidectomies were predominantly performed on females in their fifth decade of life. The most common indications for thyroidectomy were colloid goitres, followed by follicular adenomas and Hashimoto's thyroiditis. Malignancies accounted for 24% of the cases, with papillary carcinoma thyroid being the most common (65.5% of malignancies), followed by follicular carcinoma thyroid (31% of malignancies), and one case of poorly differentiated carcinoma. Notably, males exhibited a higher propensity for developing malignancies in thyroid swellings compared to females. Similar trends were observed in a study conducted in Kerala by Elizabeth et al., where females accounted for 89% of the study population compared to 11% males [8]. Multinodular colloid goitre was the most common diagnosis necessitating thyroid surgeries, representing 71.5% of cases. Thyroid malignancies constituted 18.8% of total cases, with papillary carcinoma thyroid accounting for 75% and follicular carcinoma accounting for 22% of malignancies.

Conclusion

The study underscores the prevalence of thyroid disorders necessitating surgery, with colloid goitre as the primary indication. Females, particularly in their fifth decade, constituted the majority of surgical cases. Malignancies, notably papillary carcinoma thyroid, were significant, with a higher risk observed in males.

These findings highlight the importance of understanding demographic distributions in thyroid pathologies for targeted interventions and optimized patient care.

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