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Histopathological Audit of Thyroid Lesions: A Retrospective Study in a Tertiary Care Hospital

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ABSTRACT

Objectives: *The present study aims to determine the pattern of thyroid lesions in thyroidectomy specimens received in the Pathology Department of Ibn-e Sina Hospital, Multan, Pakistan.* ***Materials and methods:*** *In the current research all the thyroidectomy and subtotal thyroidectomy specimen from any age, sex were included. Previously diagnosed cases with any neoplastic lesions were excluded from the research. The biopsy registers were reviewed and different lesions were categorized. Age and sex-wise variations of the lesions were noted. The study proposal was reviewed and accepted by the hospital ethical committee. Statistical analysis was done using the frequency distribution table in the Microsoft Excel Office.* ***Results:*** *A total of 1465 cases presented with thyroid nodule were histopathologically examined. Among these cases 1169 cases were diagnosed as simple goiter, 146 as adenoma and 86 cases were proved to be malignant tumors. These 86 malignant cases were comprised of papillary thyroid carcinoma (n=43) and follicular thyroid carcinoma (n=43). While 64 cases were categorized as "other".* ***Conclusion:*** *The majority of the thyroid nodules are either non-neoplastic or benign neoplasm. Papillary and follicular thyroid carcinomas share equal prevalence in Pakistani society according to the findings of the present study.*

Keywords: Goiter, Thyroid adenoma, Papillary thyroid carcinoma, Follicular thyroid carcinoma

INTRODUCTION

Clinical audit is "a quality improvement process that seeks to improve patient care and outcomes through a systematic review of care against explicit criteria, and the implementation of change" [1]. The audit is a cyclical process that includes a selection of topic, setting standards, data collection, analysis of results, and re-audit [2]. The aim of the audit was to improve the quality of care [3]. Pathology audits focus on uses, cost-effectiveness, adequacy, and quality improvement of laboratory procedures.

Thyroid enlargement is one of the most common disorders of the endocrine system. Goiter is an enlarged thyroid gland [4]. Goiter though a worldwide problem is endemic in mountainous regions of the world. In Pakistan, it is particularly prevalent in Northern areas of the country situated in the base of the Himalayas, which are iodine deficient areas [5].

Long-standing goiter (for more than 5 years) is regarded as the strongest risk factor for thyroid carcinoma [4]. According to Hussain, et al., the commonest cause of thyroid enlargement is multinodular goiter followed by thyroid tumors [6].

Tumors of the thyroid characterized by follicular growth pattern constitute the most common type of lesion of this organ encountered by pathologists. A frequent problem posed by encapsulated follicular patterned lesions in which the nuclear changes of papillary carcinoma are only present focally or are questionable [7]. Chernobyl Pathologists Group categorized these tumors as well-differentiated tumors of uncertain malignant potential (WDT-UMP) i.e, encapsulated tumors with questionable nuclear changes and no capsular or vascular invasions [8,9].

Very rarely the thyroid gland can also be the site of metastasis. The increasing incidence of thyroid lesions warrants

the need for institutions to provide a database of their demographic and clinical profile. The present study aims to determine the pattern of thyroid lesions in thyroidectomy specimens received in the Pathology Department of Ibn-e Sina Hospital, Multan, Pakistan.

MATERIALS AND METHODS

This was a 12-years retrospective study, carried out in the Department of Pathology, Ibn-e Sina Hospital, Multan, Pakistan. A total of 1465 thyroidectomy specimens received in the histopathology laboratory, from January 2007 to December 2018 (12 years), were included in the study. In the current research, all the thyroidectomy and subtotal thyroidectomy specimen from any age and sex were included. Previously diagnosed cases with any neoplastic lesions were excluded from the research. For each case, the laboratory request form and duplicate copy of the histological report were retrieved and relevant clinical information such as age, sex and the histological type of thyroid disease were extracted. All biopsies had been fixed in 10% formal saline, routinely processed for paraffin embedding then microtome sectioned at 5 μm and stained with Haematoxylin and Eosin. The corresponding slides were retrieved from the archive and reviewed by the study pathologists. The lesions were classified based on their main histological diagnostic features. Special stains like Congo Red, Periodic acid Schiff and reticulin were used whenever needed. After pathological diagnosis, the demographic data and final report were systematically entered into the register. The biopsy registers were reviewed and different lesions were categorized. Age and sex-wise variations of the lesions were noted. The study proposal was reviewed and accepted by the hospital ethical committee. Statistical analysis was done using the frequency distribution table in Microsoft Excel Office.

RESULTS

During this 12-year period of audit, a total of 1465 cases presented with thyroid nodule were histopathologically examined. Among these cases 1169 cases were diagnosed as simple goiter, 146 as adenoma and 86 cases were proved to be malignant tumors. These 86 malignant cases were comprised of papillary thyroid carcinoma (n=43) and follicular thyroid carcinoma (n=43). While 64 cases were categorized as "other" including undifferentiated carcinoma, squamous cell carcinoma, non-Hodgkin lymphoma, Hodgkin lymphoma, etc. (Table 1).

Table 1 A 12-years distribution of benign and malignant thyroid lesions

Years	Cases	Benign Lesions		Malignant Lesions		Others
		Goiter	Adenoma	Papillary Thyroid Carcinoma	Follicular Variant	
2007	90	76	3	4	2	5
2008	121	94	15	3	1	8
2009	133	107	20	2	-	4
2010	119	101	8	4	1	5
2011	122	111	7	3	-	1
2012	110	81	15	4	5	5
2013	166	114	31	4	3	14
2014	130	104	16	4	1	5
2015	133	117	10	3	1	2
2016	129	97	9	5	14	4
2017	125	100	9	5	2	9
2018	87	67	3	2	13	2
Total	1465	1169	146	43	43	64

The age range was 10-85 years in those cases which were suffering from benign thyroid disease i.e. goiter and adenomas. While in cases with malignant thyroid diseases, the age range was 14-85 years (Table 2).

Table 2 Age range of the cases suffering from benign and malignant thyroid lesions

Type of Lesions	Number of Cases	Age range (Years)
Benign Lesions	1315	10-85
Malignant Lesions	86	14-85
Total Cases	1401	

It had been noted that a number of females suffering from malignant thyroid tumors were quite high both in papillary thyroid and follicular carcinomas n=36 and n=41 respectively as compared to males, n=7 and n=2 respectively (Table 3).

Table 3 Gender distribution in patients with malignant thyroid lesions

Type of Malignant Lesion	Male	Female	Total Cases
Papillary Thyroid Carcinoma	7	36	43
Follicular Variant	2	41	43

DISCUSSION

Diseases of the thyroid gland are among the most abundant endocrine disorders worldwide second only to diabetes. Thyroid disease is being increasingly diagnosed with greater awareness and is one of the chronic non-communicable diseases affecting women more, though males are not spared of the ailment [10]. Thyroid lesions range from non-neoplastic to neoplastic. Multinodular goiter is the commonest cause of thyroid enlargement followed by thyroid tumors [11]. Most of the tumors are benign in nature but can simulate malignancy [12]. Thyroid cancer is a relatively rare malignancy, representing only 1.5% of all cancers, but it is the commonest endocrine cancer accounting for 92% of all endocrine malignancies. Papillary carcinoma is the most common thyroid malignancy followed by follicular carcinoma, medullary carcinoma, anaplastic carcinoma and lymphoma [13].

In this retrospective study, a total of 1465 cases of thyroid lesions were audited that had been presented in a tertiary care hospital during a period of 12-years. As reported in the "results section", the most common lesions presented were solitary and multinodular goiter, followed by benign adenomas. Although malignant were also observed they comprised a quite less proportion as compared to inflammatory and benign lesions. Quite an interesting finding was an equal proportion of papillary and follicular thyroid carcinomas. Most of the findings were almost in line with the already reported findings but the findings related to the equal prevalence of papillary and follicular thyroid carcinomas was not in line with reported literature because many researchers have documented a high prevalence of papillary thyroid carcinoma [14].

It has been reported in the literature that papillary carcinoma was the most common histologic variant, and the majority occurred in the third decade. Similarly, Ariyibi and Duduyemi in Ibadan also reported papillary carcinoma as the most common malignant thyroid neoplasm although with a lower rate (41.8%) followed by follicular carcinoma (32.7%) [15]. Ijomone, et al., reported 55% for papillary carcinoma and 30% for follicular carcinoma [16]. Hussain, et al., in Karachi reported a rate of 77.9% for papillary carcinoma and 12.6% for follicular carcinoma similar to the findings in this study [11]. Abdulkareem in Basrah, Iraq, recorded (56.6% and 26%), even in Pakistan, Bukhari and Sadiq reported (90.2% and 2%) for papillary and follicular carcinoma, respectively [17,18]. These contrasting findings may be attributed to the geographic influence of iodine deficiency and causal relationship with the incidence of follicular carcinoma [19]. In the United States, papillary carcinoma is the most common thyroid neoplasm and accounts for 75% to 85% of cases, followed by follicular carcinoma which accounts for 5% [20]. The global trend in the preponderance of papillary carcinoma over other thyroid carcinoma was demonstrated in our findings.

CONCLUSION

The majority of the thyroid nodules are either non-neoplastic or benign neoplasm. Papillary and follicular thyroid carcinomas share equal prevalence in Pakistani society according to the findings of the present study.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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