

**HISTOPATHOLOGICAL EVALUATION OF THYROID LESIONS AT TERTIARY CARE CENTER IN PAKISTAN****Dr. Noreena Aslam<sup>\*1</sup>, Dr. Farah Mustafa<sup>2</sup>, Dr. Muhammad Baber Shehzad<sup>3</sup>, Dr. Shumaila Manzoor<sup>4</sup>, Dr. Anam Ghaffar<sup>5</sup>**

Pakistan.

**\*Corresponding Author: Dr. Noreena Aslam**  
Pakistan.DOI: <https://doi.org/10.17605/OSF.IO/UB6TD>

Article Received on 21/05/2019

Article Revised on 11/06/2019

Article Accepted on 01/07/2019

**ABSTRACT**

**Background:** Thyroid lesions are a common problem in Pakistan. The prevalence varies in different regions of the country according to multiple studies due to the unequal distribution of iodine. The thyroid disorders in the country range from goiter to thyroid malignancies and medical practitioners can request a histopathological evaluation of any of these lesions for diagnostic purposes. **Objective:** The study aims at determining the types of thyroid lesions in Pakistan and the common gender and age groups that are predisposed to the disease. **Patients and Methodology:** The study was carried out at the pathology department of Nawaz Sharif Social Security Teaching Hospital Lahore, for a duration of 9 months from January 4th 2018 to September 8th 2019. A total of 125 people underwent a histopathological evaluation at the request of a medical practitioner for further assessment. The collected samples were analyzed and the recorded. **Results:** The ages of the patient ranged from 31 to 74 years, with a median age of 59 years and a mean age  $48.3 \pm 3.8$  years. Females were 74 (59.2%) while the males were 51 (40.8%). Goiter or thyroid enlargement was higher in patients aged between 31 to 39 years, and thyroid carcinoma was most prevalent in the geriatrics aged 57 to 74 years. In all the results of the analysis obtained, females dominated all the disorders from goiter, thyroid nodules, and thyroid carcinoma. An assessment of the types of thyroid carcinoma was done which showed that papillary carcinoma was the most prevalent at 29 (83%) followed by medullary and follicular thyroid carcinoma at 5.7% and 2.95% respectively. **Conclusion:** Thyroid lesions are common in Pakistan. The prevalence of the disease increases with advanced age. Females are more affected by all types of thyroid diseases than males. Papillary carcinoma is the most prevalent type of thyroid cancer.

**KEYWORDS:** Thyroid carcinoma, Thyroid nodules, Thyroid enlargement (Goiter) Histopathological evaluation.**INTRODUCTION**

Histopathological evaluation refers to the microscopic examination of biological tissues to assess for pathology. A tissue is extracted from an individual for a close inspection to identify a pathological process. Histopathology is an essential approach in clinical medicine today, as it has played a significant role in providing healthcare providers with an insight into the development of a majority of diseases.

Thyroid disorders are a common problem of the endocrine system. People living in some countries of Asia, such as Pakistan are predisposed to the disease due to their consistent consumption of goitrogen rich foods and iodine deficiency.<sup>[1]</sup> Goiter is one of the most prevalent thyroid illnesses in the Pakistan population and affects individuals living in the mountainous regions of the country, specifically those living in the northern areas which border the Himalayas.<sup>[2]</sup> Unfortunately, there is

limited data on the prevalence of thyroid diseases in other parts of the country.<sup>[1]</sup>

Multiple kinds of thyroid lesions have been reported in Pakistan, and a significant number needs histopathological analysis. The lesions affect people of all ages and either gender. There is a delay in seeking medical attention, and the majority of the affected individuals will only seek medical when they have a visible or palpable goiter.<sup>[1]</sup> The delay in seeking medical care predisposes the people to other advanced thyroid lesions such as thyroid carcinoma and advanced thyroid nodules. Thyroid nodules affect about 5% of the Pakistani population, and most remain undiscovered until the patient has succumbed to the illness, with up to 50% of these nodules being found incidentally during autopsies.<sup>[3]</sup> There has been increased evaluation of thyroid lesions in the country by using imaging techniques, especially ultrasound which has found that 60%-70% of the population has small sized thyroid.<sup>[3]</sup>

When found incidentally during these processes, they are referred to as thyroid incidentalomas.<sup>[4]</sup> Majority of the thyroid lesions have a similar and high risk of developing thyroid cancer.<sup>[3]</sup>

It is difficult to diagnose a thyroid tumor by just palpating or clinical evaluation alone. A definitive investigation such as histopathology is crucial to enabling the practitioner to affirm the diagnosis. Histopathological evaluation is essential in the diagnosis of thyroid lesions. In Pakistan, it is mainly done in tertiary hospitals. For a country with a high prevalence and mortality rate from thyroid associated illnesses, histopathological evaluation could be the way to curb the menace. This research focuses on how the process is done in the pathology department of Nawaz Sharif Social Security Teaching Hospital Lahore, a tertiary healthcare facility in Lahore, Pakistan.

#### PATIENTS AND METHODOLOGY

The research was carried out in the pathology department of Nawaz Sharif Social Security Teaching Hospital Lahore, for a duration of 9 months from January 4th 2018 to September 8th 2019. The inclusion criteria allowed for patients who have been diagnosed with any thyroid lesion and were set to undergo a histopathological assessment, and the patients had to be willing to undergo the process. Patients who had thyroid lesions and were not scheduled for histopathological evaluation and those who were scheduled but were unwilling to undergo the process were excluded from the study. A total of 125 patients were eligible to be part of the study. They were informed about the research and their rights during participation and signed consent. Although some of these participants succumbed to related illnesses before the end of the study, the results acquired from their specimens were considered valid for the study.

All the patients underwent a biopsy, and the specimens were sent to the laboratory for histopathological evaluation. The samples obtained were well labeled using the patients' initials to avoid mistakes and data corruption and sent to the laboratory immediately after collection. The specimens were then fixed using 10% formalin. The tissues were made into blocks and sectioned to thickness size of 0.5 microns, and stained with hematoxylin and eosin. No tissue was destroyed, and the process of preparing them for a histopathological analysis was handled to the highest degree of accuracy and professionalism. A histopathologist analyzed the slides, and the results recorded.

#### Data Analysis

Despite the specimens having the patient information for their evaluation by the hospital, the data obtained from the study was analyzed anonymously to protect the identity of the participants. The statistical analysis of the data was done using SPSS version 25. Continuous variables were presented as median and range with nominal data presented as percentages.

#### RESULTS

The mean age of the participants was  $48.3 \pm 3.8$  years, and females were 74 (59.2%) while the males were 51 (40.8%). The median age of the participants was 59 years. The ages of the participants ranged from 31 to 74 years.

The diseases diagnosed from the evaluation included goiter (thyroid enlargement), thyroid carcinoma, and thyroid nodules. The prevalence of these diseases also varied depending on the age of the patient, as illustrated in the table below.

Patient Age group	Number of patients	Thyroid Enlargement	Thyroid Nodule	Thyroid Carcinoma
31 to 39 years	18	14	4	0
40 to 48 years	28	11	12	5
49 to 57 years	31	10	13	8
58 to 66 years	30	10	9	11
67 to 74 years	18	2	5	11
<b>Total number</b>	<b>125</b>	<b>47</b>	<b>43</b>	<b>35</b>

The malignancy rate increased with age with individuals aged over 65 years having a thyroid carcinoma rate of 11(61%) while those below 48 years had a malignancy prevalence rate of 5(10.9%). Overall, thyroid

enlargement (goiter cases) made the highest percentage at 37.6%, followed thyroid nodules at 34.4% and thyroid carcinoma at 28%. However, the prevalence of each of these diseases varied with age.

The cases were also different based on gender, but females predominated all of them

Gender	Thyroid enlargement (Goiter)	Thyroid nodules	Thyroid carcinoma	Total Number
Male	21	18	12	<b>51</b>
Female	26	25	23	<b>74</b>

The thyroid carcinomas were also evaluated to determine the commonest types and the age group that was most affected.

Type of cancer	Age Groups				
	31 to 39 years	40 to 48 years	49 to 57 years	58 to 66 years	67 to 74 years
Papillary carcinoma	0	3	6	9	11
Medullary carcinoma	0	2	0	0	0
Follicular carcinoma	0	0	1	0	0
Undifferentiated carcinoma	0	0	1	1	0
Mixed medullary and papillary carcinoma	0	0	0	0	0
Poorly differentiated carcinoma	0	0	0	1	0
<b>Total Number</b>	0	5	8	11	11

Papillary carcinoma was the most dominant type of cancer, with 29 of the 35 cases, which was 83%. Medullary and follicular carcinomas were diagnosed in younger people, and some of the cancers were not even diagnosed, such as the mixed medullary and papillary carcinoma. Females were also the most affected gender by thyroid carcinoma making up 23(65.7%) while males were just 12(34.3%).

## DISCUSSION

The study revealed that cases of thyroid lesions increase with increasing age. According to Gesing<sup>[5]</sup>, the thyroid gland, just like other endocrine organs, undergoes significant functional changes with age, which leads to an increase in the prevalence of thyroid disorders with increasing age. The subclinical disturbances of thyroid function are more frequent in older adults as compared to overt diseases.<sup>[5]</sup> Females were also more affected by all the thyroid lesions that were investigated as compared to males. This finding is in line with multiple studies done in Pakistan. A retrospective review of 998 cases of thyroid carcinomas done by Bukhari, Sadiq, Memon & Baig<sup>[6]</sup>, revealed that women made up a majority of the patients at approximately 83%. Samad et al.<sup>[2]</sup>, also found out that women are the most affected by thyroid disorders. While this finding is in line with all the studies done on gender and thyroid diseases, the mechanism of higher prevalence in the older women as compared to males has not been understood.<sup>[7]</sup> Some theories have been developed such as the susceptibility gene with sex hormone receptors which causes pathology, eventually leading to thyroid carcinoma<sup>[6]</sup>, and the expression of estrogen receptors on neoplastic thyroid epithelium.<sup>[8]</sup>

The malignancy rate increased with increase in age, although some type of cancers were common in younger people in the study as compared to the older people. A review of 998 cases of thyroid carcinoma done by Bukhari, Sadiq, Memon & Baig<sup>[6]</sup>, revealed that majority of the cases in the country are papillary carcinoma which is in line with this study. Medullary and follicular carcinomas were also common in the younger people, and could not be diagnosed in individuals over 60 years<sup>[6]</sup>, which is also a finding in this study. The prevalence of follicular carcinoma was at 2.95, which is in agreement with the research done by Bukhari, Sadiq, Memon & Baig.<sup>[6]</sup> However, some studies have found a higher percentage with an analysis done by Islam<sup>[9]</sup>,

showing that the percentage in Pakistan ranges between 6 and 13%. The rate of medullary carcinoma was at 5.7% which is in line with multiple other studies such as 4.5% by Bukhari, Sadiq, Memon & Baig<sup>[6]</sup> and Hussain, Anwar Nadia & Ali<sup>[10]</sup>, who recorded a 4.2% prevalence rate for medullary thyroid carcinoma.

Different studies done in Pakistan on thyroid diseases have always shown similar results but with varying percentages or prevalence rate. Papillary carcinoma is likely to be the most frequent in all studies, but the percentages will vary. In an attempt to answer this question, Samad et al.,<sup>[2]</sup> attributed the contrast in findings to the geographical variance in iodine deficiency in the country. Iodine prophylaxis has been introduced in areas prone to thyroid diseases, which has led to an increase in the relative frequency of papillary carcinoma over follicular carcinoma.<sup>[6]</sup>

## Study Limitations

This research is a laboratory-based and carries the limitations associated with this type of study, which mainly is the lack of a realistic representation due to highly controlled factors. Future studies should seek to include the iodine and goitrogen content in the food consumed by the participants.

## CONCLUSION

Pakistan is one of the areas with a high prevalence of thyroid diseases. The rate of prevalence varies in different regions due to the iodine content consumed by the inhabitants per region. Females are more affected by thyroid lesions than males, and the risk of acquiring these diseases increases with age. Thyroid carcinomas are more frequent in older adults. Papillary thyroid cancer is the most predominant type of malignancy in the country.

## REFERENCES

1. Jawa, A., Jawad, A., Riaz, S. H., Assir, M. Z. K., Chaudhary, A. W., Zakria, M., & Akram, J. (2015). Turmeric use is associated with reduced goitrogenesis: Thyroid disorder prevalence in Pakistan (THYPAK) study. *Indian journal of endocrinology and metabolism*, 19(3): 347. doi: 10.4103/2230-8210.152768
2. Samad, A., Ali, K., Fayyaz, N., Akhtar, N., Mahmood, N., & Kashif, M. (2019).

- Histopathological Audit of Thyroid Lesions: A Retrospective Study in a Tertiary Care Hospital. *International Journal of Medical Research & Health Sciences*, 8(5): 173-176. <https://www.ijmrhs.com/abstract/histopathological-audit-of-thyroid-lesions-a-retrospective-study-in-a-tertiary-care-hospital-18406.html>
3. Ram, N., Hafeez, S., Qamar, S., Hussain, S. Z., Asghar, A., Anwar, Z., & Islam, N. (2015). Diagnostic validity of ultrasonography in thyroid nodules. *J Pak Med Assoc*, 65(8): 875. <https://www.ncbi.nlm.nih.gov/pubmed/26228335>
  4. Kamran, M., Hassan, N., Ali, M., Ahmad, F., Shahzad, S., & Zehra, N. (2014). Frequency of thyroid incidentalomas in Karachi population. *Pakistan journal of medical sciences*, 30(4): 793. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4121700/>
  5. Gesing, A. (2015). The thyroid gland and the process of aging. In *Thyroid Research*, 8(1): A8. doi: 10.1186/1756-6614-8-S1-A8
  6. Bukhari, U., Sadiq, S., Memon, J., & Baig, F. (2009). Thyroid carcinoma in Pakistan: a retrospective review of 998 cases from an academic referral center. *Hematology/oncology and stem cell therapy*, 2(2): 345-348. <https://www.ncbi.nlm.nih.gov/pubmed/20118058>
  7. Ding, X., Xu, Y., Wang, Y., Li, X., Lu, C., Su, J., & Jin, Y. (2017). Gender disparity in the relationship between prevalence of thyroid nodules and metabolic syndrome components: the SHDC-CDPC community-based study. *Mediators of inflammation*, 2017. <https://doi.org/10.1155/2017/8481049>
  8. Derwahl, M., & Nicula, D. (2014). Estrogen and its role in thyroid cancer. *Endocrine-related cancer*, 21(5): T273-T283. doi: 10.1530/ERC-14-0053.
  9. Islam N. (2011) Thyroid Carcinoma. *Journal of Pakistan Medical Association*, 66(10). <https://jpma.org.pk/article-details/3007>
  10. Hussain, N., Anwar, M., Nadia, N., & Ali, Z. (2005). Pattern of surgically treated thyroid diseases in Karachi. *Biomedica*, 21(1): 18-20. [https://inis.iaea.org/search/search.aspx?orig\\_q=RN:37117939](https://inis.iaea.org/search/search.aspx?orig_q=RN:37117939)