

Frequency of Thyroid Lesions at Pathology Department of King Edward Medical University Lahore

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ABSTRACT

Background: Thyroid gland is notorious for carrying commonest endocrine pathologies and also for commonest endocrine malignancy. It is the 5th most common cancer in human beings. This makes to carry out current study to get insight of frequency of thyroid lesions at tertiary care level.

Methods: This was a descriptive cross-sectional study. The study was done at the Department of Pathology, King Edward Medical University Lahore with the collaboration of four surgical units of Mayo Hospital Lahore from 2010 to 2019. Total 1601 cases were included. Information about age, sex and diagnosis was entered in the pre designed proforma. SPSS version 22 was used for data analysis. Descriptive analysis was done and the results were presented as frequencies, percentages and ratios. The results were then studied against local and international data.

Results: This study revealed non neoplastic and neoplastic lesions as 1323 (82.63%) and 278 (17.37%) respectively. Bulk of the lesions 61.6% were between the age bracket of 20-39 years. Mean±SD for age was 34.22±11.42 years. Female to male ratio(F:M) was in favour of females as 9.81:1. Among the non neoplastic lesions, MNG 1151(87%) was a dominant lesion followed by TH 82(6%). LT 29(2.19%) and HT 26(1.96%) were other important lesions. F:M ratio was 10.80:1. Neoplastic lesions were divided into benign 178(64%) and malignant tumors 100(36%). FA was the leading benign neoplasm 164(59%). Rest of the benign tumors shared a minor fraction except HCA 12(4.31%). Among the malignant category, Papillary carcinoma 69(24.82%) dominated over MC 12(4.31%). FC 7(2.51%) and AC 6(2.15%) were other significant findings. F:M ratio in malignancy was 3.16:1 which was significantly lower than 13.83:1 in benign tumors.

Conclusion: MNG is the dominant lesion among the non neoplastic lesions while in the neoplastic category FA was leading as benign neoplasm. Papillary carcinoma turned out to be the commonest malignant tumor. Major share of all the lesions were seen between 20-39 years.

Keywords: MNG, Papillary carcinoma, Follicular adenoma, neoplastic lesions

INTRODUCTION

Thyroid diseases are among the commonest endocrine disorder.¹ Its prevalence is further accentuated at autopsy in different studies as 9.3% , 45.4% and 8-65%.²⁻⁴ Malignant cases constituted 1% of all human cancers and most common endocrine malignancy(90%). In United states it is ranked as 5th most common cancer and comprises 3% of all cancers.⁵ In many countries including USA its incidence has been increasing over the past many years with special concerns about papillary carcinoma(PC)⁶. Worldwide annual incidence from 0.5 to 10/100000 of thyroid neoplasia is noticed.⁷ However global incidence varies with iodine deficient areas. It is also attributed to geographical, ethnic, environmental factors and radiation exposure. It is endemic in mountain areas of the world and likewise common in northern areas of Pakistan⁸⁻¹⁰.

It is more common in females.⁹ This fact is verified by different local and international studies which revealed male to female ratio as 1:3.7,1:6.6 and 1:3.5, 1:5.5.^{1,11-13} Male to female ratios are quite distinctive in respect of non neoplastic and neoplastic and benign versus malignant cases. Someswara and colleagues noticed the difference as 1:8.23 and 1:4.22 between non neoplastic and neoplastic lesions while this was 1: 6.33 and 1: 3.16 between benign and malignant tumors.¹² Variation in age ranges are noticed in different studies as 14-95, 11-89 and 9-70 years^{1,11,14}. Majority of the lesions are noticed between the age group of fourth decade¹⁵⁻¹⁷.

Different studies highlighted wide range of lesions in thyroid. These are divided as neoplastic and non neoplastic pathologies and neoplastic are further divided in adenoma and malignant tumors. Non neoplastic lesions predominates over neoplastic diseases and this fact was supported by various local and international studies as 82.85% vs 17.14%, 72.3% vs 27.7%, 82% vs 18%, 77.78vs 22.22% and 71%vs 29% respectively^{10,11,14,15,18}.

Among the non neoplastic lesions multinodular goiter (MNG) predominates over the other lesions. A study by Nazar Hussain and colleagues revealed multinodular goiter(MNG) ,colloid goiter(CG), toxic goiter(TG), thyroid cyst, lymphocytic thyroiditis(LT), hashimoto thyroiditis (HT), granulomatous thyroiditis(GT) as 61.63%, 2.27%, 0.91%, 2.57%, 3.32%, 0.06% and 0.15% respectively¹⁹. Somewhat different results were noticed by another local study against similar above diagnostic entities as MNG(76.1%), CG(1.8%), TG(0.6%), HT(2.6%), LT(0.3), GT(0.3%) respectively¹⁴.

In various studies major neoplastic lesions include benign and malignant tumors. Nazar Hussain and associates described follicular adenoma (FA) and hurthel cell adenoma (HCA) as 14.05% and 0.15% and malignant tumors as 14.35%. Among malignancy, PC predominates with 77.89% followed by follicular carcinoma (FC) (12.63%). Other malignancies composed of Medullary carcinoma(MC), anaplastic carcinoma(AC) and hurthel cell carcinoma with 4.21%, 3.16% and 2.11% respectively¹⁹. Yet another study in neighbouring country India, discussed 35.7% neoplastic lesions in which PC predominated with 22.7% followed by FA (8.5%). Poorly differentiated carcinoma (PDC), MC and AC constituted 0.2% each¹³. Distinctive variation is noticed by another study where 26% of neoplastic lesions include benign FA 40% and 60% malignant tumors¹⁶.

These wide variations necessitate to conduct another study to look into the matter to evaluate and validate the real picture of thyroid lesions especially at tertiary level institution.

MATERIALS AND METHODS

This was a descriptive cross sectional study conducted in the department of pathology at King Edward Medical University Lahore with collaboration of general surgical units of Mayo Hospital Lahore. Data from 2010 to 2019 was retrieved from the computer software. Ethical approval was granted by secretary institutional review board. Purposive convenient sampling was used. A sample size of 1601 was calculated by taking confidence level as 95%,

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relative precision as 6% and expected prevalence of thyroid lesions as 40%.³ Cases of all ages with history of total and subtotal thyroidectomies were incorporated in the study. Unfixed and cases with inconclusive data were excluded from the study.

Records of the patients were retrieved using computer software. Information about age, sex, diagnosis were entered onto the proforma. SPSS version 22 was used for descriptive analysis and qualitative variables were tabulated as frequencies, percentage and ratios while quantitative variables as mean±standard deviation (SD). Results thus obtained were compared with local and international studies.

RESULTS

In our study non neoplastic and neoplastic lesions constitute 1323 (82.63%) and neoplastic 278 (17.37%). Majority of the lesions 61.6% were between the age of 20-39 years followed by 27.2 % between 40-59 years(Figure#1). Mean±SD for age was 34.22±11.42. Minimum and maximum ages were 2 years and 90 years while range was 88 years. Female to male ratio(F:M) in thyroid lesions was in favour of females as 9.81:1.

Among the non neoplastic lesions MNG 1151(87%) was a predominant finding followed by 82(6%) of thyroid hyperplasia(TH). Other significant lesions were LT 29(2.19%) and HT 26(1.96%). Rest of the lesions comprised of minor fraction. Major chunk of these lesions were seen in female especially LT and HT (Table# 1). F:M was 10.80:1 among non neoplastic lesions.

Neoplastic lesions were dominated by benign 178(64%) against 100(36%) malignant tumors. FA constituted the major share of benign neoplasms 164(59%). Rest of the lesions shared a minor fraction except HCA 12(4.31%). As expected PC with 69(24.82%) was a leading finding followed by MC 12(4.31%). FC 7(2.51%) and AC 6(2.15%) were other significant findings(Table#2). F:M ratio in malignancy was 3.16:1 and significantly higher with 13.83:1 in benign tumors. Overall F:M ratio in neoplastic lesions was 6.7:1.

Table 1: Stratification of non neoplastic lesions of thyroid against sex (n=1323)

Diagnosis	F	M	Total	%age
Multinodular goiter	1051	100	1151	87.00
Thyroid hyperplasia	74	8	82	6.00
Lymphocytic thyroiditis	28	1	29	2.19
Hashimoto thyroiditis	26	0	26	1.96
Colloid goiter	19	0	19	1.43
Colloid nodule	8	0	08	0.60
Colloid cyst	3	1	4	0.30
Dyshormogenic goiter	1	0	1	0.07
Dequervains thyroiditis	0	1	1	0.07
Graves disease	1	0	1	0.07
Thyroglossal cyst	0	1	1	0.07
Total	1211	112	1323	100

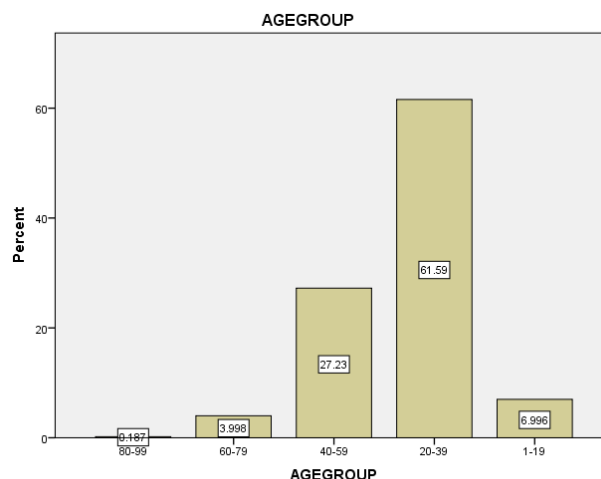
M=Male, F=Female

Table 2: Stratification of neoplastic lesions of thyroid against sex (n=278)

Diagnosis	F	M	Total	%age
Follicular adenoma	154	10	164	59.00
Papillary carcinoma	52	17	69	24.82
Medullary carcinoma	9	3	12	4.31
Hurthel cell adenoma	11	1	12	4.31
Follicular carcinoma	7	0	7	2.51
Anaplastic carcinoma	5	1	6	2.15
Insular carcinoma	2	1	3	1.07
Poorly differentiated carcinoma	1	1	2	0.71
Mature cystic teratoma	1	0	1	0.35
MSCC	0	1	1	0.35
Schwannoma	0	1	1	0.35
Total	242	36	278	100

M=Male, F=Female, MSCC=Metastatic squamous cell carcinoma

Fig. 1: Percentages of age groups of thyroid lesions



DISCUSSION

Thyroid stands out to be the most common site for endocrine disorder and at the same time commonest endocrine malignancy(90%)¹. Chances of thyroid nodules being malignant are 4-6.5%⁴. Worldwide incidence varies and linked with iodine deficient areas. Other factors are geographical, ethnic, environmental and radiation exposure. Globally it is endemic in mountain areas and similarly common in northern areas of Pakistan⁸⁻¹⁰. Special concerns are noted in previously irradiated thyroid lesions for developing cancers from 20-50%²⁰. Its prevalence is more common in females⁹.

In our study overall F:M ratio was 9.81:1 however in non neoplastic and neoplastic lesions it turned out to be 10.80:1 and 6.7:1. In malignancy and benign neoplasms it changed to 3.16:1 and 13.83:1 correspondingly. Varied results were seen in different studies but all in favor of females. Overall F:M ratio in different studies were 6.19:1, 5.5:1, 6.35:1 and 6.6:1^{12,13,17,19}. Somswara and colleagues also noticed these ratios in non neoplastic, neoplastic, benign and malignant tumors as 8.23:1, 4.22:1, 6.33:1 and 3.16:1 respectively.¹² Thus distinct variation was noticed in case of benign solitary nodules as compared to our study.

In the current research handful number of lesions (61.1%) were seen between the ages of 20-39 years with over all Mean±SD as 34.22±11.42. Other studies validated our outcome with 51.6% and 54.48% in this bracket of age group which is a bit lower side as compared to ours^{12,17}.

We noticed dominance of non neoplastic lesions 1323(82.63%) over neoplastic solitary nodules 278 (17.37%). MNG 1151(87%), TH 82(6%), LT (2.19%) 29 and HT 26(1.96%) were important non neoplastic lesions. Rest of the lesions constituted minor fraction. Imtiaz and colleagues also validated our results with non neoplastic lesions(82%) comprising MNG(76.1%), HT(2.6%) and only 0.3% of LT.¹⁴ A study at Karachi Pakistan described MNG(61.63%) and autoimmune thyroiditis(3.92%) which is somewhat different with respect to MNG from our outcome.¹⁹ Yet another study revealed only 71% of non neoplastic lesions and significant contribution was from MNG(90%) , LT(5.5%), and some cases of HT(0.7%) and TH(0.3).¹⁸ Marked variation can be noticed with respect to TH which was high in our research(6%) and this can be due to subjective or dietary variation. Another local study showed somewhat closer results to our study with non neoplastic lesions constituting 74%. Breakup of important lesions exhibited MNG(91.3%), LT(4.03), HT(1.07%)

and TH(0.3%).¹⁶ Difference was significant regarding TH which was in our study 6%. Bharati and associates noticed only 64.3% of non neoplastic lesions which is quite low as compared to our study. It was mainly composed of MNG (39.9%) followed by high percentages of HT (7.3%) and LT (4.1%) as compared to current research¹³.

More important were neoplastic lesions which constituted 278(17.37%) of the cases in the current study. Further analysis enumerated 178(64%) benign neoplasm and only 100(36%) malignant tumors(Table#1). FA composed of 10.24% followed by HCA(0.75%) of the total thyroid lesions. Out of total 100 cases of malignancy, PC(69%) was prominent followed by MC(12%), FC(7%), AC(6%), IC(3%), PDC(2%) and one case of metastatic squamous cell carcinoma. Uzma and colleagues revealed a different story with 26% of neoplastic lesions which further contrasted our results with only FA(40%) as benign neoplasm and 60% malignant cases. Among the malignancy, PC (90.2%) dominated followed by MC (4.5%), FC(2%) and undifferentiated carcinoma(2%).¹⁶ In comparison our percentages among malignancy were telling different story. This was quite stunning outcome regarding PC. It could be some inter observer variation because diagnosing PC is challenging in some institutes. In another local study regarding neoplastic lesions(28.55%), malignant lesions(50.3%) dominated over benign tumors(49.3%). FA comprised of 14.05% followed by HCA (0.15%). In the malignant category (14.35%), PC(77.89%) was nearly matching our figure. However variable results were noted with FC(12.63%), MC(4.21%), AC(3.16%).¹⁹ Bharati and associates noticed neoplastic lesions (35.7%) which was almost double against our study. FA constituted only 8.5% followed by 22.7% of PC. Increased number of malignant cases was against our finding. However PC(63.5%) shared majority of malignant tumors and this is in accordance with our outcome.¹³ Almost matching results in terms of PC(70%) were seen from Dhaka however malignant cases shared only 18% which were different from ours(36%)²¹.

CONCLUSION

This study validate some of the local and international studies however somewhat different picture was noticed regarding PC, MNG and FA. Our study confirmed commonest neoplastic PC among the malignancy and FA as benign entity. Whereas MNG remained the commonest non neoplastic lesion. Variations among the studies might be due to interobserver variability and some geographic and environmental factors.

Conflict of interest: Authors have no conflict of interest.

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