

Exploring the Incidence of Malignancy in Thyroid Swelling: A Cross-Sectional Perspective

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Abstract

Introduction: Thyroid malignancy is a global health problem. It is the most common among all endocrine malignancies. The incidence of thyroid cancer is increasing all over the world. Bangladesh is not exempted. The worldwide prevalence of goiter in the general population is estimated at 4-7%. The incidence of malignancy in goitrous thyroid is about 10%. An increased incidence of thyroid carcinoma has been noted in endemic goiter zones. Bangladesh also has some goitrous zones. The frequency of carcinoma is two times higher in solitary thyroid nodules than in multinodular goiter. Male patients with thyroid swelling showed a high incidence of malignancy. **Objective:** The study aims to find out the incidence of malignancy in thyroid swelling in a tertiary level hospital of Bangladesh. **Materials and Methods:** It is a cross-sectional observational study done in the department of ENT & HNS, Cumilla Medical College Hospital from January 2023 to December 2023 with 60 hospitalized patients of different thyroid swelling undergone surgery. **Results:** In this series of 60 patients of thyroid swelling the age of the patients ranged from 15 to 80, the mean age was 37.73. There were 53 females (88.33%) and 07 males (11.66%) with female to male ratio of 7.6:1. Among the non-neoplastic group (n=33;55%) nodular goitre had the highest incidence (n=20;33.33%) followed by multinodular goitre (n=11;18.33%). The incidence of papillary cell carcinoma was predominant. Among 60 patients with thyroid swelling, it was 28.33% (n=17) and among the malignant lesions (n=22) it was 77.27% (n=17). The incidence of malignancy (n=22;36.66%) is more than that of benign (n=5;8.33%). A high incidence of malignancy is observed in male sex. 05 male patients out of 07 were malignant bearing an incidence of 71.42%. In relation to the age of the malignant patients, the incidence is high in 31–40-year group (27.27%). The incidence of malignancy is high in extreme ages also noted. **Conclusion:** The incidence of thyroid malignancy in thyroid swelling is high. Females of middle age are in a risk group and papillary carcinoma is the commonest of all thyroid malignancies. Appropriate medical attention is warranted for early diagnosis and proper management to reduce morbidity and mortality.

Keywords: Thyroid swelling, papillary carcinoma, follicular carcinoma, medullary carcinoma, thyroid cancer.

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Introduction:

The exact incidence of thyroid cancer in Bangladesh is not known but an estimated 2.58% of the 2,629 patients attending the Institute of Post-graduate Medicine and Research (IPGMR, Currently BSMMU) from January 1994 to June 1995 were suffering from thyroid carcinoma¹. Moreover, the incidence of malignancy of solitary thyroid nodules is significantly higher in Bangladesh (18.65%) than in other countries.

Patients presenting to the surgical outpatient department with nodules of the thyroid gland are quite common. About 8% of the adult population has clinically palpable nodules of the Thyroid gland. With advances in imaging techniques, especially high-resolution ultrasonography, the rates of detection of clinically impalpable thyroid nodules have increased manifolds^{3,4,5}.

Thyroid cancer is the most common among all endocrine malignancies³. It accounts for 1% of all malignancy⁴. The worldwide prevalence of goiter in the general population is estimated at 4-7%. The incidence of malignancy in the goitrous thyroid is about 10%⁵. An increased incidence of thyroid carcinoma has been noted in endemic goiter zones^{6,7}. The frequency of carcinoma is two times higher in solitary thyroid nodules than in multinodular goiter. Male patients with solitary thyroid nodules showed a high incidence of malignancy⁸.

A Thyroid nodule can be defined as a palpable lesion or a lesion radiologically distinct from the surrounding normal parenchyma of the gland. Depending on the number, the nodules are classified as either solitary or multiple. The solitary nodule can either be single or can be a dominant nodule in a multinodular gland which cannot be palpated. Solitary nodules occur more frequently in females as compared to males, their prevalence going as far as up to 4 times in the female gender. The nodules can be either asymptomatic and detected on a routine clinical examination or the patient might give a history of a solitary swelling in the front of the neck either of a short duration or more commonly of a longer standing duration.

The exact cause of thyroid cancer is not known but there are a few predisposing factors which favor in genesis of thyroid malignancy, such as age, sex, geographic distribution, familial predisposition, radiation exposure, pre-existent thyroid disease⁹. Differentiated thyroid carcinoma e.g., papillary carcinoma and follicular carcinoma are more common. Both arise from thyroid follicular cell¹⁰. Papillary carcinoma is about 80% among all thyroid malignancies. It occurs in all age groups and is the only thyroid cancer in children¹¹. Follicular carcinoma commonly occurs in older age usually between 50-59 yrs. It accounts for 10-20% of all thyroid malignancies.

Medullary thyroid carcinoma is about 5% of all thyroid malignancies that arise from perifollicular cell (C cell). It may occur as a part of MEN syndrome, as familial NON-MEN disease or it may be sporadic. Anaplastic

carcinoma is common in the elderly. It is more aggressive and has highly metastatic potential¹². Primary thyroid lymphomas are uncommon. Usually, high-grade B cell lymphoma tends to occur in middle-aged and older patients.

Materials and Methods:

It is a cross-sectional prospective observational study done in the department of ENT & HNS, Cumilla Medical College Hospital, Bangladesh from January 2023 to December 2023. The study population are patients with thyroid swelling of different sizes undergone surgery. A total of 60 patients were included. Patients presenting with any thyroid swelling (multinodular or solitary nodule), and patients between 15 to 80 years of age, both male and female gender were included in this study. Cases of thyroiditis, patients with a previous history of head and neck irradiation, pregnant females, and patients unfit for surgery were excluded. Detailed history was taken regarding the presenting history of the swelling and history to trace the etiological causative factors of the swelling. Additionally, past history, history of any co-morbidities, family history of thyroid disease, drug history and other relevant histories were obtained and documented. A detailed general physical, systemic and thyroid swelling examination was done. Furthermore, baseline routine blood investigations as well as specific investigations like thyroid profile, fine needle aspiration cytology (FNAC), X-ray of the neck-anteroposterior and lateral views to look for retrosternal extension in larger swellings, high-resolution USG of the neck, chest X-ray and indirect laryngoscopy to ascertain the condition of the vocal cords was done. Patients who were either in a hypothyroid or hyperthyroid state were made euthyroid by medical therapy before undergoing surgery. All patients underwent surgery, and the histopathological reports were evaluated and correlated with clinical diagnosis by standard statistical methods [SPSS-IBM-version-28.0.0.0(190)]. Different types of surgery were done depending on the indication like total, Hemi, near-total or subtotal thyroidectomy. The study aimed to find out the incidence of malignancy in thyroid swelling irrespective of nodular or multinodular goiter depending on the histopathological report of the surgically removed thyroid tissue.

Results:

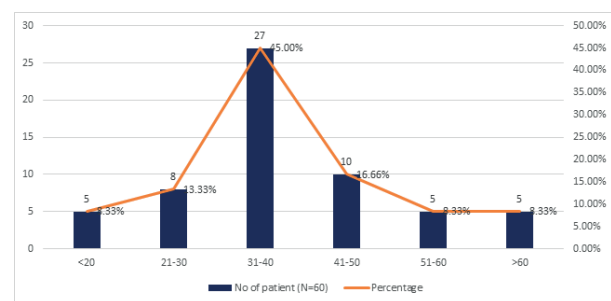


Figure 1: Age distribution among participants

The age of the patients ranged from 15 to 80 years with a mean age of 37.73 yrs.

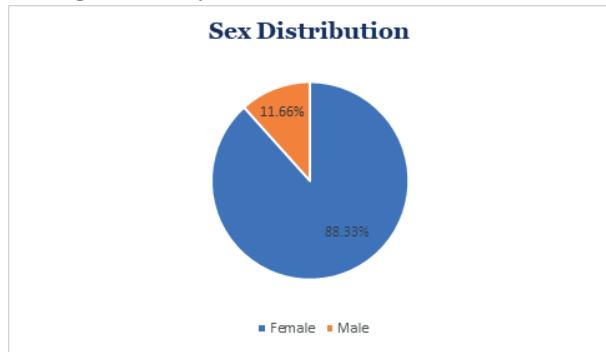


Figure 2: Sex distribution:

The thyroid malignancy is more common in females than males in a ratio of 7.6:1.

Table I: Post-operative histopathology findings: Non-neoplastic.

Histopathology findings	Number of patients(N=60)	percentage
Multinodular goiter	11	18.33%
Nodular goiter	20	33.33%
Hashimoto thyroiditis	02	03.33%
Total	33	55.00%

Among the non-neoplastic lesion's nodular goiter (33.33%) is predominant followed by multinodular goiter (18.33%).

Table II: Post-operative histopathology findings: Neoplastic.

Histopathology findings	Number of patients(N=60)		percentage
	benign	malignant	
Follicular adenoma	03	--	05.00%
Hurthel cell tumor	02	--	03.33%
Follicular carcinoma	--	03	05.00%
Papillary carcinoma	--	17	28.33%
Medullary carcinoma	--	02	03.33%
Total	05	22	45.00%

Among the neoplastic lesions papillary cell carcinoma (28.33%) is predominant followed by follicular adenoma and follicular carcinoma each (05%).

Table III: Histological pattern of malignant lesion

Histological pattern	Number of patients(N=60)	percentage
Papillary carcinoma	17	28.33%
Follicular carcinoma	03	05.00%
Medullary carcinoma	02	03.33%
Total	22	36.66%

Table IV: Malignancy among different age groups

Age in year	Number of malignant patients	Percentage
<20	04	18.18%
21-30	04	18.18%
31-40	06	27.27%
41-50	03	13.63%
51-60	04	18.18%
>60	01	4.54%

Table V: P-value of different variables:

Serial Number	Variables	Group-1	Group-2	Z-value	P-value
1	Sex	Female 53(88.33%)	Male 07(11.67%)	3.56	<0.001
2	Age	<20 years 04(18.18%)	>20 years 56(81.82%)	3.18	<0.001
3	Types of Goiters	Non-neoplastic 33(55%)	Neoplastic 27(45%)	0.39	>0.05
4	Neoplastic	Benign 05(22%)	Malignant 22(78%)	2.93	<0.01
5	Malignant	Papillary Carcinoma 17(77.27%)	Other Carcinoma 05(22.73%)	2.56	<0.05

Discussion:

In this series highest number of patients were in the 31-40 years age group numbering 27 (45%) followed by 10 (16.66%) in the age group of 41-50 years age group with female predominant (figure I). This result corroborates with other studies^{13,14,15,16}. The youngest patient in our series was a girl of 15 years, suffering from papillary carcinoma, while the oldest one was a female of 80 years with the same disease. The extreme of ages shows more chance of being malignant^{23,24}. The youngest and oldest patient of our study has been suffering from malignant thyroid disease that corresponds to that study. Females were more predominant in this study than males with a ratio of 7.6:1 (figure II) which is a bit higher than other studies^{13,14,15,16}. Md. Iqbal Hossen et al¹³ and Dr. Shanta B et al¹⁷ found the same result of 5.25:1 while Lakshmi YA et al¹⁶ and M A Matin et al¹⁴ found the ratio 4:1 and 3.54:1 respectively. But Hossain MA et al¹⁸ reported the female to male ratio as 7:1 and Babu R et al²² as 8:1 that correspond to our study. Among the 60 patients of our study, 27 patients (45%) were detected neoplastic and 33 patients (55%) were non-neoplastic (table I, II). M A Matin et al¹⁴ found the as 66% non-neoplastic and 34% neoplastic in their 200 cases series while Dr. Shanta B et al¹⁷ found as 70% non-neoplastic and 30% of neoplastic in their 50 patients' series. Our result is almost near to their result. Regarding neoplastic lesions 05 (08.33%) patients were benign and 22 (36.66%) patients were malignant among 60 patients. The almost same result shown by M A Matin et al¹⁴ was 2.5% benign and 31.5% malignant. In the present series, papillary cell carcinoma was found to be the highest incidence at 28.33% (n=17) followed by follicular cell carcinoma at 05% (n=03) and medullary cell carcinoma at 3.33% (n=02) each. Papillary cell carcinoma has the highest findings in other series as 29.5%¹⁴, 15%¹⁹, 21.5%²⁰ and 18%²¹. The incidence of malignancy is higher in overall "thyroid swelling" than that of solitary nodules. Our and Matin et al¹⁴ studies show almost the same result as our patients were of "thyroid swelling" irrespective of multinodular or solitary nodular and other studies were on only "solitary nodule". showing low frequency. Among 22 malignant lesions 17 cases (77.27%) were papillary cell carcinoma, 03 cases (13.63%) were follicular cell carcinoma and 2 cases (09 %) medullary cell carcinoma. More or less this same type of incidence was

found in other studies^{13,14,18}. We didn't find any anaplastic carcinoma or lymphoma. Malignant lesion in relation to sex we found 05 male patients out of 07 were malignant bearing an incidence of 71.42%. Of them papillary cell carcinoma 02, follicular cell carcinoma 03 and medullary cell carcinoma 02. We observed incidence of malignancy is almost twice that of females, which is supported by other studies^{13,19,23}. We also observed the male preponderance of medullary carcinoma as our 60 patients' series have only 02 cases of medullary carcinoma and they are all male sex. Incidence of malignancy is higher in extreme ages also noted in our study. Both of our elder and oldest patients were diagnosed with papillary cell carcinoma, and they were both females.

Conclusion:

A remarkable portion of thyroid swelling (35%) underwent surgery was malignant. Females of middle age (31-40 years) were in risk group with papillary carcinoma (28.33%) as the most common pattern. Even if it is too small any thyroid swelling should not be ignored. Appropriate medical attention is warranted for early diagnosis and proper management to reduce morbidity and mortality.

Conflict of Interest: None.

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