

MALIGNANCY IN SOLITARY COLD NODULE THYROID

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Abstract

Introduction: The thyroid gland is one of the largest endocrine gland constitute of two lobes connected by an isthmus. Thyroid nodules are a frequent clinical problem and its incidence is rising. The solitary nodules are the palpable nodule in otherwise normal gland whereas dominant nodules are the palpable nodule in an enlarged gland. There is a variable frequency of malignancy in solitary cold nodule. Our study is aimed to find its frequency in local population.

Objective: To determine the frequency of Malignancy in solitary cold nodule thyroid.

Material and Methods: This is the descriptive case series study conducted at East Surgical Ward, Mayo Hospital Lahore in 1 year duration from 01-01-2014 to 31-12-2014. 140 patients age more than 12 years of either sex with confirmed solitary cold nodule thyroid

of any size on physical examination, ultrasound and thyroid scan through non-probability purposive sampling technique were included in the study. A biopsy of the cold nodule was sent to hospital laboratory to determine the frequency of malignancy. All demographic and clinical findings were recorded on a pre-designed proforma. All collected data was entered and analyzed by using SPSS 20. Quantitative variables like age and size of nodule was presented in the form of mean $\pm$ SD and qualitative variables like gender and malignancy was presented in the form of frequency and percentages. Post-stratification chi-square test was applied, P-value ≤ 0.05 as significant.

Results: The mean age of the patients was noted as 40.10 ± 11.62 years. There were 47.14% male patients while 52.86% female. Malignancy was found in 23 (16.43%) patients whereas absent in 117 (83.57%) patients.

Conclusion: It is concluded that the malignancy is more frequent in solitary cold nodule thyroid in our local population and in timely intervention and proper screening is recommended.

Keywords: *Malignancy, Cold Nodule Thyroid, Thyroid Scan, Biopsy.*

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Introduction

The thyroid is an endocrine gland located in the neck extending from middle of thyroid cartilage to 6th tracheal ring just below the larynx. Thyroid nodules are swelling (round or oval – shaped) within the thyroid due to various conditions, most of which are benign.¹

Thyroid nodules are a frequent clinical problem

and its incidence is rising due to advent of thyroid ultrasound.² Thyroid nodules are more common in female by a ratio of 4:1. Its incidence increases with age and decrease dietary iodine.³ It is common in a patient with head and neck radiation, develops at the rate of about 2% per year compared with 0.1% per year in patients without exposure.³ The solitary nodules are the palpable nodule in otherwise normal gland whereas dominant nodules are the palpable nodule in an enlarged gland. The nodule is considered cold when there is no radioactive iodine uptake by a nodule on thyroid scan, hot when there is increases uptake and warm when the uptake is similar to normal gland.

The majority of thyroid nodules are benign, which includes simple or hemorrhagic cysts, colloid nodules, follicular adenomas, or thyroiditis. The overall risk of malignancy in a thyroid nodule is 5 – 10%. Thyroid nodules are quite common in the general population, though thyroid cancer is relatively uncommon with annual incidence in united states of about 37,340 cases in 2008, which constitute about 2.6% of all cancers and 0.3% of all cancers death.⁴ The frequency of malignancy in cold nodule is highly variable; a histopathological review of 400 cases showed 10% to be malignant,⁵ while in another study histopathology of 104 solid cold nodules showed 36 (34.6%) to be malignant.⁶

The literature is unclear regarding this topic and gives frequency of malignancy in cold thyroid nodule with a very variable range 10% – 34.6%.^{5,6} The study is to find the exact frequency of malignancy in our local population and helps for early diagnosis and prompt management of the patient to reduce the morbidity and mortality.

Methodology

This study was conducted on 140 patients admitted in East Surgical Ward of Mayo Hospital, Lahore in 1 year duration from 01-01-2014 to 31-12-2014. It was a descriptive case series by design and patient selection was non probability purposive sampling. All patients aged more than 12 years of either sex with confirmed single cold nodule thyroid of any size by Physical examination, Ultrasound and thyroid scan were included in the study. Patients unfit for surgery (assessed on investigation) or having multinodular goiter (MNG) on examination were not included in the study.

The patients were assessed clinically. Ultrasound and thyroid scan was performed to determine solitary

cold nodule of thyroid. The solitary nodules were the palpable nodule in otherwise normal gland whereas cold when there was no radioactive iodine uptake by a nodule on thyroid scan. Relevant investigations like CBC, blood sugar, urea&creatinine, electrolytes etc were done as per usual protocol. All these patients were operated by an experienced surgeon. A biopsy of the cold nodule after surgery was sent to hospital laboratory to determine the malignancy. Their postoperative management and follow-up was done as per routine.

All collected data was entered and analyzed by using SPSS 20. Quantitative variables like age and size of nodule was presented in the form of mean $\pm$ SD and qualitative variables like gender and malignancy was presented in the form of frequency and percentages. Post-stratification chi-square test was applied keeping a P-value $\leq$ 0.05 as significant.

Results

In this study total 140 cases were enrolled. The mean age of the patients was noted as 40.10 ± 11.62 years with minimum and maximum ages of 20 and 60 years respectively (Table 1).

There were 66 (47%) male patients while 74 (53%) female patients. The malignancy was observed in 23 (16.43%) patients whereas 117 (83.57%) patients had no malignancy (benign) (Table 2).

Table 1: Descriptive statistics of age (years).

Age (years)	n	140
	Mean	40.10
	SD	11.62
	Minimum	20.00
	Maximum	60.00

Table 2: Distribution of Malignancy found in thyroid nodule.

		Frequency	Percent
Malignancy	Positive	23	16.43
	Negative	117	83.57
	Total	140	100.0

Out of 66 male patients, 11 (16.67%) had malignant thyroid nodule while 55 (83.33%) had no malignancy (benign). Out of 74 female patients, 12 (16.22%) had malignant thyroid nodule while 62 (83.78%) had no malignancy (benign). The difference between both genders was found to be insignificant i.e. p-value = 0.92 (Table 3).

Table 3: Comparison of Thyroid Malignancy in both genders.

		Gender		Total
		Male	Female	
Malignancy	Positive	11 (16.67%)	12 (16.22%)	23 (16.43%)
	Negative	55 (83.33%)	62 (83.78%)	117 (83.57%)
Total		66 (100%)	74 (100%)	140 (100%)

Chi value = 0.009

p-value = 0.92 (Insignificant)

Discussion

Most of the thyroid nodules are benign, only few thyroid nodules are subjected for surgical management. Diagnosis and treatment is based on risk stratification on the basis of history, physical examination, and relevant tests. Thyroid nodules with compressive symptoms (Airway compression, Dysphagia, Distended neck veins etc) or those with high risk for carcinoma needs prompt evaluation for surgical management.

About 5% of adult population of United States have a palpable thyroid nodule.⁷ Its incidence increases with age and decrease dietary iodine intake, and are more frequent in female population. The overall risk of malignancy in a thyroid nodule is 5 – 10%.⁸ Thyroid nodules are quite common in the general population, though thyroid cancer is relatively uncommon with annual incidence in united states of about 37,340 cases in 2008, which constitute about 2.6% of all cancers and 0.3 % of all cancers death.⁴

In this study, the malignant thyroid nodules were observed in 23 (16.43%) patients whereas negative (benign) in 117 (83.57%) patients.

The frequency of malignancy in cold nodules observed to be about 10 – 20% and in hot nodules about 4%.^{9,10} The exception to this rule is an 'incidentaloma' identified on PET scan (18-FDG). These incidentaloma carries a malignancy risk of about 50%, so should be managed considering it as a solitary thyroid nodule.¹⁰

The frequency of malignancy in cold nodule is highly variable; a histopathological review of 400 cases showed 10% to be malignant,⁵ while in another study histopathology of 104 solid cold nodules showed 36 (34.6%) to be malignant.⁶

Due to the advent of thyroid ultrasonography, the prevalence of thyroid nodules in randomly selected population has increased to a range of 20% to 67%, more common in women and the elderly. The above

data signifies that the incidence of thyroid incidentaloma is not rare.¹¹⁻¹⁵ In addition, autopsy result showed that thyroid nodule were present in 37 – 57% of population who had no history of any thyroid diseases.^{15,16}

Saddique M demonstrated in their study that the use of FNAC in solitary and dominant thyroid nodule for diagnosis of malignancy showed an accuracy of 96.6%, sensitivity 75%, Specificity 95.83%, positive predictive value 81.81% and negative predictive value 93.81%.¹⁷

Different studies showed that the prevalence of thyroid nodules on examination is only about 4 – 7%, but by the use of ultrasound it increases between 19 and 67%.¹⁴

About 20 – 48% of patients with solitary thyroid nodules detection on examination will have additional nodule when examined by thyroid ultrasonography.¹⁸ Thyroid nodules are more common in female by a ratio of 4:1. Its incidence increases with age and decrease dietary iodine.¹⁹

Thyroid nodules are common in a patient with head and neck radiation, develops at the rate of about 2% per year compared with 0.1% per year in patients without exposure.³ Study conducted by Islam showed that about 66.10% thyroid nodule were cold nodule in their patients.²⁰

In the context of Graves' disease, a prospective study conducted on 245 patients showed that 35% had thyroid nodules and about 3.3% were malignant, mostly micro papillary carcinomas.²¹

There are variable data regarding malignancy in cystic and solid nodules, some study showed very low incidence of malignancy in cystic nodules (0.5 – 3%), whereas others have similar incidence in solid nodules.²²⁻²⁴

Thyroid nodules are frequent clinical entity, diagnosed by palpation (4%),²⁵ by ultrasound (33% to

68%)^{26,27} and on autopsy series (50%).¹⁶

We stratified data for gender and found that among 66 male patients, 11 (16.67%) had malignant thyroid nodule and 55 (83.33%) had benign thyroid nodules while among 74 female patients, 12 (16.22%) had malignant thyroid nodule and 62 (83.78%) had benign thyroid nodules. The difference between both genders was found to be insignificant i.e. p-value = 0.92 and we found that there is no relationship of gender with malignancy of thyroid nodules.

Conclusion

Hence the frequency of malignancy in solitary thyroid nodule is high in our local population and in time intervention and proper screening is recommended. The data in this study is highly significant and recommend early diagnosis and prompt management of the patient with solitary thyroid nodule to reduce the morbidity and mortality.

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