



Incidence of Malignancy in Solitary nodule of Thyroid

KEYWORDS

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ABSTRACT

This study aimed at to detect the incidence of malignancy in solitary nodule thyroid among the patients who got admitted at Osmania General Hospital at Hyderabad during September 2014 to September 2016.

237 patients were selected with STN. Patients were evaluated clinically and were offered surgery based on suspicious findings from the clinical assessment, diagnostic work up, comprehensive symptoms and eosmoses. All the patients underwent hemi thyroidectomy, subtotal thyroidectomy based on the pre-operative and intra operative findings

INTRODUCTION

Solitary thyroid nodule (STN) is a palpably discrete swelling with an otherwise normal thyroid. The most common problems faced by both the surgeons and pathologists is the evaluation of this apparently single thyroid mass. The incidence of STN increases throughout life & STN in younger patients are more likely neoplastic.

STN is a common clinical problems, especially in females where it is four times as common as in men. Cancer of the thyroid is also more common among females (females: males, 2:1). Therefore, STN in males carry a two folds increased risk of malignancy.

Since cancer is known to occur frequently in STN than multinodular goiter (MNG), STNs are conventionally viewed with suspicion. Clinically detectable thyroid nodules occur in 4.7% of the population.

Clinical examination cannot reliably distinguish between a STN and a dominant nodule in MNG and three fourths of clinically STN actually represent dominant nodules of MNG.

Noninvasive screening tests used in the evaluation of STNs are Thyroid scanning and Ultrasonography, 75-90% of STN are cold and most of these are benign. The reported incidence of malignancy in STN varies from 10.4-44.7%.

Ultrasonography (USG) can determine whether thyroid nodules are solitary and can categorize them into solid, cystic and mixed (solid- cystic) nodules. Solid nodules have a higher incidence of malignancy (21%) as compared to cystic (7%) and mixed nodules (12%)

However, ultra-sonographic appearances can be misleading and solid lesions may be mistaken for cystic and vice versa. It appear, therefore that USG which may be used for the follow up of known benign nodules, is not appropriate as a primary investigative modality

For thyroid nodules, thyroid functions tests and thyroid antibodies have little or no role in the diagnosis of solitary thyroid nodule (STN).

Thyroid Hormone suppression has been used at times for

diagnostic and therapeutic purposes in thyroid nodules with the rationale that involution is indicative of a benign lesion. However anything less than complete involution does not rule out cancer and conversely lack of involution does not rule out malignancy

The scope of fine needle aspiration Cytology (FNAC) in selecting cases that require surgery and in providing pre-operative morphologic diagnostic has gone a long way in obviating unnecessary surgery as well as in planning surgical and other treatment protocols.

A large body of world literature attests to the accuracy and advantages of the cytological technique for screening of thyroid nodules. In many centers around the world, cytology is now the primary preoperative investigative modality in clinically suspicious thyroid neoplasms

In search of a screening method for STNs cytology has unquestionably been the answer, being cost effective with the added advantages of accurate morphologic typing of thyroid tumors in a large percentage of cases

This study has been conducted to detect the incidence malignancy in solitary nodule thyroid by comparing the clinical features and histopathological pictures. The importance of solitary thyroid nodule lies in the increased risk of malignancy compared with other thyroid swelling. The incidence in solitary nodule varies from 5% to 20% in different surveys, whereas the incidence of malignancy in multinodular goiter is only 3-5%.

OBJECTIVE OF STUDY

This study aimed at to detect the incidence if malignancy in solitary nodule thyroid among the patients who got admitted at Osmania General Hospital at Hyderabad during September 2014 to September 2016.

MATERIALS AND METHODS

A retrospective study was carried out on 237 patients who had been admitted and operated on for STN from 2005-2007 These patients had been referred do this Centre for nodular goiter that had been picked up on clinical examination as well as on ultra-sonography thyroid. None of these had history of irradiation to the thyroid or exposure irradiation

All 237 patients have undergone the following investigations prior to surgery

General:	Complete Blood Picture Complete Urine Examination HB percent Random Blood Sugar Blood urea Serum Creatinine ECG Chest X-ray Blood grouping Clotting and bleeding time
Specific:	Thyroid function tests Ultra sonography of the neck ENT examination X-ray of the neck FNAC

These patients underwent thyroid hormone assay and most of them had a fine needle aspiration of the thyroid done. The cytological Diagnoses were grouped into Benign, malignant and inflammatory thyroiditis. The patients with malignant results were recommended to undergo surgery where as those with a benign cytological diagnosis underwent surgery (hemi thyroidectomy) in cases of rapidly growing nodule, local compression symptoms, and the cosmetic reasons. All the 237 patients the resected specimens were submitted to the department of Pathology at Osmania General Hospital, Hyderabad.

In the department of pathology the excises biopsy material was processed by the routine procedure to obtain the paraffin section that was later stained with Haematoxylin and Eosin (H & E). Subsequently, histopathological study was done and the results were compared with the cytological diagnosis.

All the patients who were planned for surgery had undergone ENT examination for the evaluation of vocal cords. The patients were offered surgery based on suspicious finding from the clinical assessment, diagnostic work up, comprehensive symptoms and cosmeses. All the patients underwent hemi thyroidectomy, subtotal thyroidectomy based on the pre-operative and intra operative findings

RESULTS

The above patients had undergone thyroid surgery between the years 2005-07. Thirty one (13%) solitary nodule contained a malignant focus.

The mean age of patients with solitary thyroid nodule was found to be 44 years, whereas the mean age for malignant foci is 36 years

Out of 237 patients about 199 (83.9%) were females and the remaining patients i.e. 38 (16%) were males. All the patients were referred to our tertiary hospital for palpable nodules in their thyroid gland. The median of duration of these lumps in thyroid was 96 days.

Ultrasonography of the thyroid was performed for 75 patients for the detection of solitary nodule to exclude multi nodular goiters. The mean size of benign thyroid was 3.3 cm while that of the malignant nodule was 3.0 (S.D., 1.8) cm.

Among all the histopathological reports of 237 patients 6% were colloid goiter, 13% malignant foci, 25% adenomatous

goiter, 5% showed Hashimotos thyroiditis and 8% are follicular variant of papillary carcinoma, one case with papillary adeno carcinoma with psamoma bodies and one case with medullary carcinoma thyroid.

Fine needle aspiration cytology was performed for all the 237 patients and 7% solitary thyroid nodule yielded inconclusive results as the aspirants contained only colloid material or blood.

Results of FNAC

	No of Goiter	Percentage
Benign	198	84%
Malignant	21	9%
Inconclusive	18	7%
Total	237	100%

Results of HPE

	No of Goiter	Percentage
Benign	206	77%
Malignant	31	13%

30 thyroid cancers i.e. 12.7% were papillary carcinoma and 1 case was found be medullary carcinoma.

DISCUSSION

Thyroid cancer is the 1% common cancer of thyroid and there is female pre-dominance. Thyroid nodules are present in 5% of the population by neck population. The incidence increases with the increasing age and 30 to 50% by ultrasonography. It has been believed that fewer than these nodules are malignant and require surgical treatment. However, Stoffer ctal reported that 13% of the glands resected to thyroid operation for any reason contained carcinoma.

The more sensitive clinical indicator of malignancy is STN is that of a painless hard lump. (57.6% of thyroid cancer present in this way). It was also noted that 50.5% of solitary nodule felt on population are actually part of multi nodular goiter. This is similar to the pickup rates of thyroid nodules as illustrated by Brander et al. even with experience and careful technique the examiner may fall fail to detect many nodules smaller than 1 cm in diameter.

High frequency real time, ultrasonography is the most sensitive tool in solitary thyroid nodule. It can also detect lymph node metastases, differentiate extra thyroidal tissues and be used to conduct ultrasonography guided biopsy. The important sonographic findings; suggestions of malignancy in thyroid nodules are micro calcifications; irregular margins of the nodule, complex echogenicity and smaller nodule. The mean size of malignant nodule is 3.0 cm. It is postulated that the thyroid cancers have manifested with more overt signs and symptoms of local invasions or metastases by the time they need a significant size.

Fine needle aspiration cytology is fast, accurate and inexpensive test to contain samples. A series of reviews have reaffirmed its importance in the assessment of thyroid nodule. When a comparison of the results for fine needle aspiration cytology and final histology was made the former had a sensitivity of 80.6% and a specificity of 8.71% the false negative rate was only 7%. These results alluded to the indispensable nature of fine needle aspiration cytology as an investigate tool.

The results of the final histology showed that 31 patients of solitary nodule of thyroid contain malignant foci i.e. 13%. 30 of these malignant tumors were papillary carcinoma and 1 case was medullary carcinoma.

Among all the histopathological examination reports, 8 cases of the papillary carcinoma are associated with Hashimoto's thyroiditis and 4 cases were Hurthle cell adenomas

These figures are in line with the finding of stoffer and Pelizzo et al. The prevalence of carcinoma in nodule goiter is indeed significant. However, Sokol suggested that the incidence of carcinoma in non-toxic thyroid nodule is low and patients can be followed up safely for up to 15 years. The physicians who were concerned about the presentation of nodular goiter had referred these patients to this tertiary centre. Therefore, the incidence of malignancy in Solitary thyroid nodule seen at the tertiary centres would be higher than that in the general hospitals.

Table 1: Distribution of age in the incidence of Malignancy

S. No	Age Distribution	No of patients	Percentage
1	10 to 19	2	6
2	20-29	10	33
3	30-39	8	26
4	40-49	6	19
5	50-59	3	10
6	60 and above	2	6
Total		31	100

The younger age of incidence of malignancy is 15 years whereas the eldest age for the incidence of malignancy is 60 years. It is found that the mean age for the incidence of malignancy is 36 years. However, it is revealed that the chances of malignancy is likely to be seen in the younger age group rather than older ages

Age Incidence of Malignancy

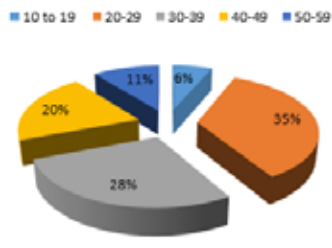


Table – 2: Distribution of Age in the incidence of Malignancy

S. NO	Sex Distribution	No of patients	Percentage
1	Male	9	29
2	Female	22	71
Total		31	100

The incidence of malignancy is high in the female population i.e. 22 (71%) whereas the male sex incidence is 9(20%). The female, male ratio is found to be 3.2:1

Thus it is revealed that women are more prone to get affected with the incidence of malignancy

Sex Distribution

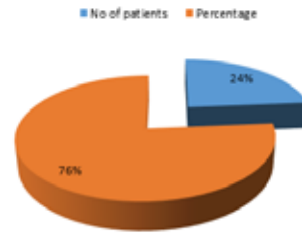


Table3: Distribution of Age in the incidence of Solitary Nodule Thyroid

S. No	Age Distribution	No. of patients	Percentage
1	10 to 19	13	5
2	20-29	79	34
3	30-39	69	29
4	40-49	43	18
5	50-59	18	8
6	60-69	12	5
7	70 and above	3	1
Total		237	100

In this series the youngest age of incidence is 12 years whereas the eldest age is 70 years. The highest number of solitary thyroid nodule is found to be group of 20-29 years i.e. 79 (34%)

The mean age of the incidence of solitary thyroid nodule is found to be 46 years

Age incidence of STN

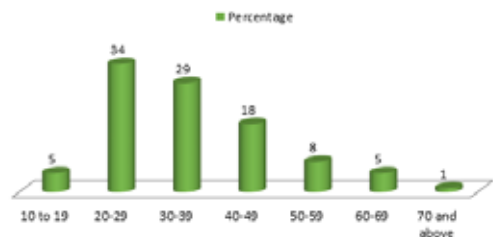


Table 4: Distribution of Age and sex in the incidence of Solitary Nodule Thyroid

S. No	Age Distribution	No. of patients	
		Male	Female
1	10 to 19	3	10
2	20-29	14	65
3	30-39	8	61
4	40-49	9	34
5	50-59	2	16
6	60-69	1	11
7	70 and above	1	2
Total		38	199

The female, male ratio in the incidence of solitary nodule thyroid is 5.2:1

Age & sex in the incidence of Solitary Nodule Thyroid

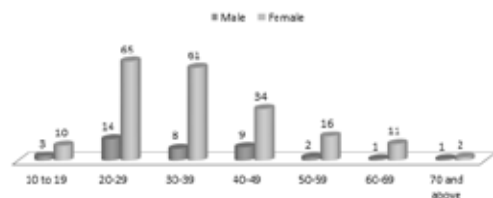


Table 5: Male, Female incidence ratio of Malignancy STN

Sex	Total No. of patients	Incidence of malignancy	Percentage
Male	38	9	23.6
Female	199	22	11.0
Total	237	31	

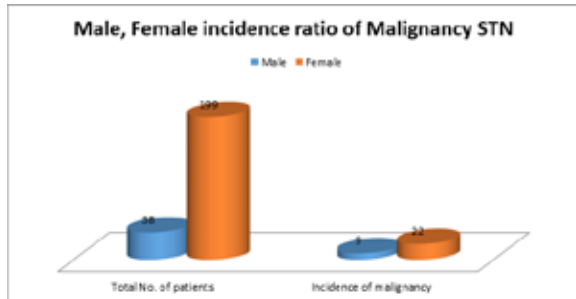


Table 6: Results of Histopathology

Type of HPE	No of cases	Percentage
Colloid Goiter / Cyst	14	6
Nodular Goiter	54	23
Follicular Adenoma with cystic change	50	21
MNG	10	4
Adenomatous goiter	59	25
HCA	4	2
Heshomotos Thyroiditis	11	5
PAP CA	31	13
Lymphatic thyroiditis	3	1
MCT	1	0
Total	237	100

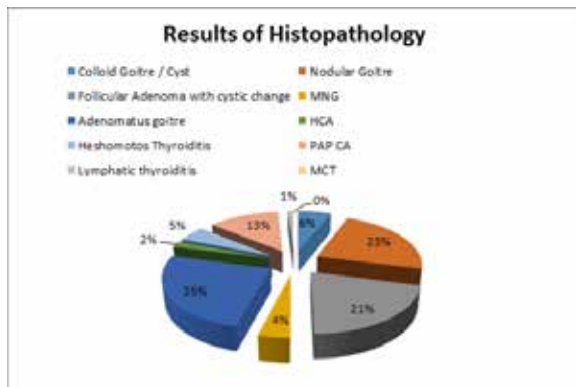
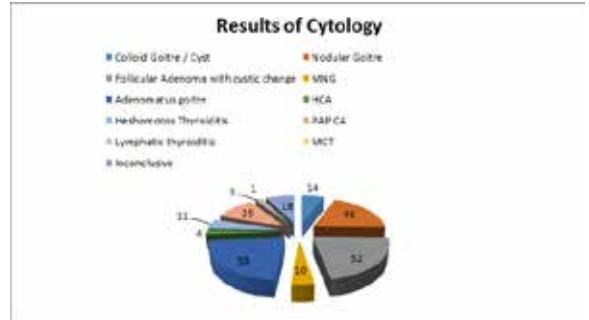


Table 7: Results of Cytology

Type of HPE	No of cases
Colloid Goiter / Cyst	14
Nodular Goiter	46
Follicular Adenoma with cystic change	52
MNG	10
Adenomatous goiter	53
HCA	4
Hashimotos Thyroiditis	11
PAP CA	25
Lymphatic thyroiditis	3
MCT	1
Inconclusive	18
Total	237



CONCLUSIONS AND OBSERVATION

The solitary thyroid nodule was frequent in females in the ratio of 3.2:1 over males

Majority of the cases are in the age group of 20-29 years

FNAC was diagnostic in 91 percent of the cases and was the only procedure providing a clue prior to surgery

The incidence of follicular adenoma is 21%, adenomatous goiter is 25%, 5% are Hashimotos thyroiditis

Out of total 237 patients about 31 patients revealed malignancy foci, out of which 30 cases showed papillary carcinoma and 1 case of medullary thyroid carcinoma

The youngest age of incidence of malignancy is 15 years whereas the oldest age is 70 years

The incidence of malignancy in solitary thyroid nodule is 13% (31 out of 237) patients

It is found that regardless of age, the risk of malignancy in men 23.6% is significantly higher than in women, 11 percentage

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