

**A CLINICAL STUDY OF SOLITARY NODULE THYROID IN GGH, GUNTUR, A. P.**A. Ravi Kamal Kumar<sup>1</sup>, Katta Srinivasa Rao<sup>2</sup>, Prasad Pulla<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT:** Any enlargement of the thyroid gland is called goitre. Clinically solitary thyroid nodule may be defined as a goitre which on clinical examination appears to be a single nodule in an otherwise normal gland. Most of the diseases of the thyroid gland may present as solitary thyroid nodule. True solitary thyroid nodules occur in 4-7% of the adult population. The present study is undertaken to study and analyse the clinical, cytopathological aspects and the management of all the cases of solitary nodule thyroid presenting to the Govt. General Hospital Guntur over a period of 2 years. **MATERIAL AND METHODS:** A prospective study of 126 cases of solitary thyroid nodule which were admitted in GGH GUNTUR over a period of 2 years was undertaken. The study was done by interviewing, clinical examination and by doing relevant investigations after taking prior informed consent. The investigation include FNAC, ultrasound of neck, x-ray neck etc., Depending on the FNAC and ultrasound findings the patient were subjected to hemi or total thyroidectomy. After completion of the study the findings and results were analysed and compared with those of the other studies. **RESULTS:** Solitary nodule thyroid cases constitute 20% of all thyroid cases admitted. The peak age incidence is in the third and fourth decade of life. Females outnumber males but carcinoma incidence in males is higher. FNAC reports of all 126 cases were compared with the HPE reports after surgery. It was found that FNAC is a reliable investigation to evaluate SNT cases with no complications related to the investigation. The HPE reports showed that out of 126 cases 85.17% are benign lesions of which follicular adenoma were commonest followed by colloid goitre. The incidence of malignancy was 14.29%. FNAC sensitivity is 92.06%. **CONCLUSIONS:** Solitary thyroid nodule is one of the commonest thyroid disorder. FNAC is an important reliable diagnostic tool for evaluation. Ultrasound of neck can be used to supplement the FNAC. Incidence of malignancy in SNT is 14.29% and the risk of malignancy is more in males. So awareness should be created to seek medical help for proper evaluation and diagnosis so that adequate treatment can be initiated at an early stage of the disease.

**KEYWORDS:** SNT, FNAC, HPE.

**INTRODUCTION:** Thyroid nodules are one of the most common endocrine diseases in the world. Any enlargement of the thyroid gland is called goitre. Clinically solitary thyroid nodule may be defined as a goitre which on clinical examination appears to be a single nodule in an otherwise normal gland. Most of the diseases of the thyroid gland may present as solitary thyroid nodule. In most cases thyroid nodules which are thought to be solitary is only one of a multitude in nodular goiter<sup>(1)</sup>. In general a nodule must reach a size of 1cm in diameter to be detectable by palpation. True solitary thyroid nodules occur in 4-7% of the adult population.<sup>(2)</sup> They cause more concern than multinodular goitre because of the higher probability of malignancy in them which can range from 5-35%.<sup>(3)</sup> Prevalence mainly depends on age, sex, iodine intake, diet (Goitrogens) therapeutic and environmental exposure. Incidence substantially higher in areas of iodine deficiency and endemic goitre. Solitary thyroid nodules can be classified into benign and malignant nodule.

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Generally most of the thyroid nodules are benign and can be classified as adenomas, colloid nodules, cysts, thyroiditis, hyper-plastic nodules. Although a great majority of solitary nodules are benign a significant minority harbour malignancy.<sup>(3)</sup>

The critical issue is to determine whether the nodule is benign or malignant. Many investigations including diagnostic imaging studies, serology and cytogenetic tests as well as histopathological techniques are available to evaluate solitary thyroid nodules. Out of these investigations, fine needle aspiration cytology (FNAC) has become the diagnostic tool of choice for the initial evaluation of solitary thyroid nodules as FNAC is a simple technique. The carcinoma in younger patients is more often of a lower grade than in older patients who tend to have a more aggressive malignancy.<sup>(4)</sup>

The present study is undertaken to study and analyse the clinical, cytopathological aspects and the management of all the cases of solitary thyroid nodules presenting to the govt. general hospital Guntur over a period of 2 years.

**MATERIAL AND METHODS:** This is a prospective clinical study of 126 cases diagnosed clinically as Solitary thyroid nodules evaluated and treated in Govt. General Hospital, Guntur, over a period of 2 years( Nov 2011-2013).

**Inclusion Criteria:** All cases of SNT presenting to GGH Guntur with any pathology on FNAC, single nodule with features of toxicity or hypothyroidism.

**Exclusion Criteria:** Clinically multinodular goiter, Thyroglossal cysts, pregnant women and pediatric age group.

A clinical study of 126 cases of solitary thyroid nodules was done by interviewing, clinical examination and by doing relevant investigations after taking prior informed consent. The investigations included thyroid function tests, FNAC and ultrasound scan of neck, indirect laryngoscopy and x-ray neck apart from other investigations for fitness for surgery.

Depending on the findings in the FNAC and ultrasound of neck the patients were treated by hemi thyroidectomy

or total thyroidectomy. Histopathological examination reports of all the operated cases were analyzed and compared with the FNAC report of the cases. Those cases of hemi thyroidectomy whose HPE report showed invasive papillary or follicular carcinoma were subjected to total thyroidectomy.

After completion of study the findings and results were analyzed, the pattern of lesions of the solitary thyroid nodule is compared to studies of others.

**RESULTS:** The total number of admissions in the department of general surgery during the 2 year study period was 8129. Out of these admissions 630 cases were thyroid swellings. Of these 126 are solitary thyroid nodules.

Year	Total surgical admissions	Total SNT cases	Percentage
Nov 2011-oct2013	8129	126	1.5

**Table 1: Incidence of solitary nodule of thyroid at GGH, Guntur**

Out of total surgical admissions (8129), 126 cases are solitary thyroid nodules which constitute 1.5%.

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Year	Total no. of thyroid cases admitted	Total SNT cases	Percentage
Nov 2011- Oct 2013	630	126	20

**Table 2: Incidence of solitary nodule of thyroid in thyroid swellings**

Out of total 630 cases of thyroid admitted, 126 cases are solitary thyroid nodules, which were taken up for study constitute 20%.

Age group (years)	Females	Males	Total
Up to 19	5	0	5
20-29	46(2)	4	50
30-39	49(8)	7(1)	56
40-49	6(2)	4(3)	10
50-59	2	3(2)	5
60 and above	0	0	0
<b>Total</b>	<b>108</b>	<b>18</b>	<b>126</b>

**Table 3: Age and sex incidence**

(Figures in the parenthesis denote the number of patients with carcinoma)

There are 108 cases of females (85.71%) and 12 out of them are malignant (11.11%). There are 18 cases of males (14.29%) and 6 out of them are malignant (33.33%).

The peak age incidence is in the third and fourth decade of life and the youngest being 14 years old girl and the oldest being 59 years old man. Although female patients outnumbered the males, the incidence of carcinoma in male patients is much higher, 3 times more than in female patients. 18 out of 126 (14.29%) cases of solitary thyroid nodules are found to be malignant.

FNAC was done for all 126 cases and the results evaluated with histopathological examination report after surgery. FNAC was repeated in 5 cases as the first cytology reports are inconclusive. None of the patients developed complications following the FNAC.

Cytology report	Number of cases	Percentage
Follicular neoplasm	76	60.31
Colloid goiter	25	19.84
Hashimoto's thyroiditis	5	3.96
Cystic	6	4.76
Malignancy	14	11.11

**Table 4: Classifications of FNAC reports**

6 cases of nodules are found to be cystic on aspiration and aspirate cytology revealed no malignancy in all cases, so all of the grouped as benign nodules.

FNAC gives no false positive reports regarding the malignancy, the nodules which are malignant on FNAC are proved malignant. FNAC could not differentiate the well differentiated follicular carcinoma from follicular adenoma accurately as the malignancy is often determined by the capsular or vascular invasion by HPE.

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Ultra sound examination was done in all 126 cases. 120 cases are reported as solid and 6 cases as cystic.

All the specimens are examined by pathology department, and the pathological diagnosis of nodules are shown below.

HPE reports	Number of cases	percentage
Follicular adenoma	66	52.38
Colloid goiter	31	24.60
Hashimoto's thyroiditis	5	3.96
Cysts	6	4.76
Malignancy	18	14.29

**Table 5: HPE reports**

On histopathological report out of 126 solitary thyroid nodules, 85.17% are benign lesions of which follicular adenoma (52.38%) were commonest group followed by Colloid Goitre (24.60%), Cysts (4.76%) and Hashimoto's thyroiditis (3.96%). The incidence of malignancy was 14.29%. Among the malignant lesions papillary carcinoma was the commonest solitary nodule (77.78%) followed by follicular carcinoma (22.22%).

FNAC	No. of cases	Percentage
Tallied with HPE	116	92.06
Not tallied with HPE	10	7.94

**Table 6: Sensitivity of FNAC**

Out of 126 cases, 116 cases i.e., 92.06% tallied with Histopathology, while the rest 10 cases i.e., 7.94% did not tally with Histopathology.

There are 18 cases of carcinoma in 126 cases of solitary nodule of thyroid constituting 14.29%. There were 14 papillary carcinomas, 4 follicular carcinomas. In 112 cases i.e., 88.89% hemithyroidectomy was done, while in 14 cases i.e., 11.11%, total thyroidectomy was performed. And in 4 cases i.e., 3.18% initially hemithyroidectomy was done which on HPE proved to be follicular carcinoma. So, completion thyroidectomy was done by removing the remaining lobe. For cystic lesions, hemithyroidectomy was done as they re-accumulated after three aspirations.

Most common complications observed after surgery was wound infection in 6 cases, i.e., 4.76% while temporary recurrent laryngeal nerve palsy was seen in 2 cases i.e., 1.59% of the cases and temporary hypocalcaemia in 5 i.e., 3.96%.

**DISCUSSION:** The present study is our experience with solitary thyroid nodule cases that presented to us in a 2 year period, in which we looked into the age and sex incidence, and the therapeutic approach to the management of solitary thyroid nodules. Solitary thyroid nodules are present in about 4% of adult population. They cause more concern than multinodular goitre because of the higher probability of malignancy in them which can range from 5-35%.<sup>(2)</sup>

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Age	Fenn et al. <sup>(5)</sup> (1980) n-342	Nagori et al. <sup>(3)</sup> (1992)n-100	Ananthakrishnan(2) et al (1993)n-503	Present study n-126
Upto 19	18	11	39	5
20-29	81	25	167	50
30-39	122	29	150	56
40-49	74	21	81	10
50-59	38	8	46	5
60above	09	06	20	0
<b>Total</b>	<b>342</b>	<b>100</b>	<b>503</b>	<b>126</b>

**Table 7: Comparison of age distribution**

The highest age incidence in the present study as well other studies was between 20-39 years. Incidence was maximum in 30-39 years age group.

Females outnumbered the males (M: F- 1:6). Higher incidence of single nodules in females is more or less constant for all age groups <sup>(6)</sup> However the incidence of malignancy is five times as much in men leading to the conclusion that solitary thyroid nodule in men must be viewed with great suspicion.<sup>(7)</sup> In males malignancy occurred in old age group.

FNAC is an accurate tool in diagnosing malignant nodules as it gives no false positive results as regards the malignancy. If FNAC reveals a papillary or medullary carcinoma pattern such nodule is considered to be malignant and total thyroidectomy can be performed. As FNAC cannot differentiate between a follicular adenoma and follicular carcinoma, a hemithyroidectomy with histopathology of the excised specimen is required. If histopathology proved to be follicular carcinoma then completion thyroidectomy is done.

FNAC	Gharib & Goellner. <sup>(8)</sup> (1993)	Looty Hooft. <sup>(9)</sup> (2004)	Present series (2013)
Benign	69%	76%	88.89%
Malignant	4%	1%	11.11%
Suspicious malignancy	10%	16%	0
Non-diagnostic	17%	6%	0

**Table 8: Comparison of FNAC findings**

Ultrasound revealed about 95.24% of the thyroid swellings as solid ones and 4.76% revealed as cystic.

In the present study majority of the patients with solitary nodules underwent hemithyroidectomy (88.89%) Similar observation was made by Ananthakrishnan et al.<sup>(2)</sup> It is better to remove all solitary nodules by hemithyroidectomy, including a good amount of normal isthmus in order not to miss a carcinoma.<sup>(5)</sup>

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Lesions	Fenn et al. <sup>(5)</sup> (1980) Percentage	Nagori et al. <sup>(3)</sup> (1992) percentage	Ananthakrishnan et al. <sup>(2)</sup> (1993) Percentage	Khadikar et al. <sup>(4)</sup> (2008) percentage	Present study (2013) Percentage
Adenoma	54.97	44	53.3	13	52.38
Colloid goitre	21.92	33	1.2	52	24.60
carcinoma	12.57	11	15.3	21	14.29
Chronic thyroiditis	5.26	2	3.6	-	3.96
cysts	2.4	6	2.3	3	4.76

Table 9: Comparison of histopathological reports

In the present study higher incidence of Adenomas was seen which in concurrence with the findings of Fenn et al.<sup>(5)</sup> Nagori et al.<sup>(3)</sup> and Ananthakrishnan et al.<sup>(2)</sup> study. Adenoma is the commonest cause of solitary nodule of thyroid in India where as Adenomatous Goitres are commonest abroad.<sup>(2)</sup>

Lesions	Psarras et al. <sup>(10)</sup> (1972)	Nagori et al. <sup>(3)</sup> (1992)	Ananthakrishnan et al. <sup>(2)</sup> (1993)	Khadikar et al. <sup>(4)</sup> (2008)	Tsegaye et al. <sup>(11)</sup> (2003)	Present study (2013)
Benign	88.3	89	84.7	79	91.8	85.71
malignant	11.7	11	15.3	21	8.2	14.29

Table 10: Comparison of benign and malignant lesions

The incidence of benign lesions was comparable to the incidence observed in other series. The incidence of malignancy (14.29%) was comparable to Ananthakrishnan et al.<sup>(2)</sup> Nagori et al.<sup>(3)</sup> Psarras et al.<sup>(10)</sup>

Majority of the solitary nodules are neoplastic 66.67% (Benign 52.38% and Malignant 14.29%). Thyroid nodules are difficult to classify and their behaviour is nearly impossible to predict since virtually any thyroid disease can present as a solitary nodule of thyroid.<sup>(4)</sup>

Lesions	Ananthakrishnan et al. <sup>(2)</sup> (1993) %	Tsegaye et al. <sup>(7)</sup> (2003) %	Khadikar et al. <sup>(4)</sup> (2008) %	Present study (2013)
Papillary carcinoma	46.8	76.6	38.29	77.78
Follicular Carcinoma	32.5	15.6	20.58	22.22
Medullary carcinoma	5.2	1.5	2.94	-

Table 11: Comparison of different types of malignancy with other studies

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Prognosis in thyroid cancer after definitive treatment depends on the histopathology of the cancer and the local extent of the disease.<sup>(4)</sup> Papillary carcinoma (77.78%) was the most common malignant lesion followed by follicular carcinoma (22.22%) The carcinoma in younger patient is more often of a low grade than in older patients who tend to have a more aggressive malignancy. <sup>(6,12)</sup>

In the present study the post-operative complications observed were wound infection in 6 cases (4.76% compared to Ananthakrishnan et al.<sup>(2)</sup> with 2.5%) and temporary laryngeal nerve palsy in 2 patients (1.59% compared to Yousef AL, Bouq MD et al.<sup>(13)</sup> with 1.5%).

**CONCLUSIONS:** Solitary thyroid nodules is one of the commonest thyroid disorder. Solitary thyroid nodules commonly occur between 20-39 age group the maximum being 30-39. Solitary thyroid nodules more common in females (M: F – 1: 6). Incidence of malignancy in solitary thyroid nodules is 14.29%, and the risk of malignancy is more in males (5 times). So awareness should be created to seek medical help for proper evaluation and diagnosis so that adequate treatment can be initiated at an early stage of the disease.

FNAC is an important diagnostic tool in the evaluation of solitary nodule thyroid with an accuracy of 92.06%, it can diagnose all benign lesions and most of the malignant lesions with an exception of inability to differentiate between a follicular adenoma and carcinoma. Benign lesions (85.71%) are more common than malignant lesions (14.29%). Among benign, adenomas (52.38%) are the most common. Among the malignancies papillary carcinoma is the most common lesion. Hemithyroidectomy (88.89%) was the commonly performed surgery. Wound infection (4.76%) was the most common complication and two patients developed temporary recurrent laryngeal nerve-palsy (1.59%).

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