



## INCIDENCE AND COMPARATIVE STUDY OF SOLITARY THYROID NODULE IN A TERTIARY CARE HOSPITAL

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**ABSTRACT** Solitary Thyroid nodules presents as a challenge in the diagnosis , evaluation and management. This study helps to identify the incidence of solitary thyroid nodule and also the incidence of malignancy in solitary lesion of thyroid. This is retrospective study to find and compare the incidence of solitary thyroid nodule in a surgically resected specimens of a tertiary hospital from 2014-2016.

**KEYWORDS :** SNT, Thyroid, Incidence Of Thyroid

### INTRODUCTION

Thyroid nodules presents as a challenge in the diagnosis , evaluation and management. Estimates for 2012 revealed Thyroid neoplasm as the fifth most expected malignancy in American women<sup>1</sup>.

A discrete swelling in an otherwise impalpable gland is termed as Solitary thyroid nodule. Thyroid lesions clinically present as nodule. These nodules are solitary or multiple comprises of both Non Neoplastic and Neoplastic lesions.

Solitary nodule occurs in 4-7% of adult population. It presents in 5% of population at an average age of 60 years. It is more common in females (6.4%) as compared to males(1.5%). Most of the thyroid nodules clinically diagnosed as solitary were hyperplastic nodules in multinodular goiter, 5 to 20% found to be true malignant lesions<sup>2</sup>. The prevalence of malignancy in solitary cold nodule is more common ,ranges from 10% to 44.7%<sup>3</sup>.

The incidence of malignancy was higher in men and young age or middle aged adults<sup>4</sup>.The incidence of thyroid malignancy in SNT varies from 4.7%-18.3%<sup>5</sup>.Solitary nodule thyroid are common in 3<sup>rd</sup> and 5<sup>th</sup> decades, the youngest patient being 15 years old and older age being 65 years. SNT is found more common in right lobe(74%) than left lobe(26%)<sup>6</sup>.

### AIM AND OBJECTIVE

- To study the incidence of solitary thyroid nodule among surgical specimens in tertiary hospital for a period of 2 years (2014-2016)
- To study the incidence of malignancy in solitary thyroid nodule
- To study the age and sex wise distribution of solitary thyroid nodule

### MATERIALS AND METHODS

This is a retrospective study of surgically removed solitary thyroid lesion. between the period of June 2014-May 2016 in a tertiary care centre. Corresponding histopathological slides were made from formalin fixed, paraffin embedded tissue of resected thyroid specimens. H&E staining was done. Histological diagnosis of each was reviewed to confirm the diagnosis.

### STATISTICAL ANALYSIS:

Statistical analysis was performed using SPSS program version 20. Comparison of qualitative variables was done using the Chi-square test.

Thyroid lesions	No.of cases	Percentage
Non neoplastic	522	81%
Neoplastic	121	19%
Total	643	100%

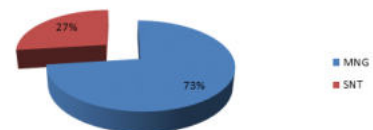
### RESULTS

The 643 surgically resected thyroid specimens were sent for histopathological examination during the study period from June 2014-May 2016. Among the 643 thyroid specimens,171 cases were clinically, radiologically diagnosed as solitary thyroid lesions.The incidence of solitary thyroid lesions was 13.29%

### DISTRIBUTION OF TOTAL THYROID LESIONS

Total thyroid specimens	643	100%
MNG	472	73%
SNT	171	27%

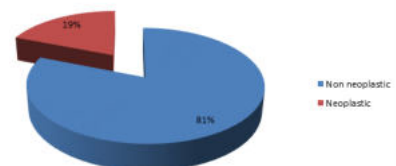
Total thyroid specimens



Out of 643 cases , Non -neoplastic lesions were 522 cases ( 81%) and Neoplastic lesions were 121 cases(19%)

### DISTRIBUTION OF THYROID LESIONS

Distribution of Thyroid lesions



Out of 171 cases of Solitary Nodular lesions, Non Neoplastic lesions were 127 cases, Neoplastic lesions were 44 cases( benign-12, malignant-32)

MNG		SNT			
NON NEOPLASTIC	NEOPLASTIC	NON NEOPLASTIC	NEOPLASTIC	BENIGN	MALIGNANT
395	20	127	12	32	
83.69%	4.24%	74.27%	7.01%	18.72%	

BENIGN NEOPLASM



MALIGNANT NEOPLASM

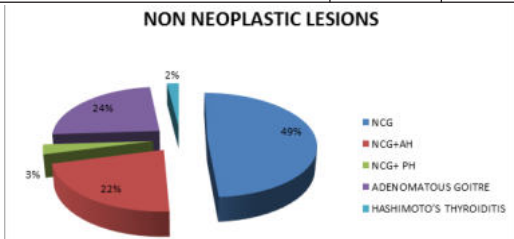


**NON NEOPLASTIC LESIONS**

Out of 127 cases of Non Neoplastic lesions, 62 (49%)cases were Nodular colloid goiter, Adenomatous goitre / Nodular colloid goiter with adenomatous hyperplasia were 59 cases(46%), nodular colloid goiter with papillary hyperplasia were 4 cases (3%),Hashimoto's thyroiditis were 2 cases (2%)

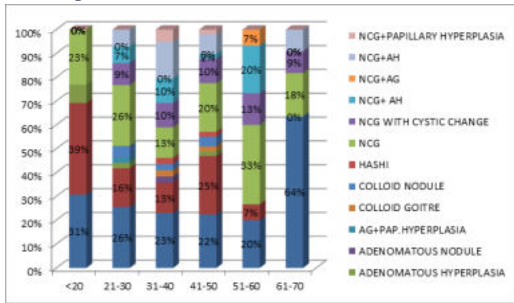
**DISTRIBUTION OF NON NEOPLASTIC LESION OF SNT**

lesions	No of cases	Percentage
NCG	62	49%
NCG+AH	28	22%
NCG+ PH	4	3%
ADENOMATOUS GOITRE	31	24%
HASHIMOTO'S THYROIDITIS	2	2%
Total cases	127	100%



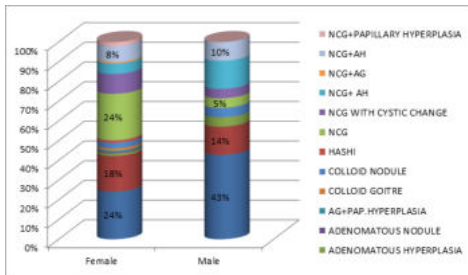
**Age distribution:**

The non neoplastic lesions were common in 3rd to 6th decade



**Sex Distribution**

The non neoplastic lesions were common in females than males.



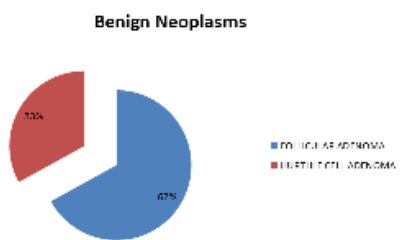
**NEOPLASM**

**BENIGN NEOPLASM:**

Out of 12 benign neoplasms of SNT, Follicular adenoma were 8 cases(67%),Hurthle cell adenoma were 4 cases(33%).

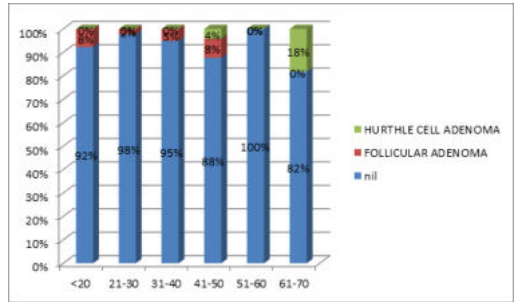
**DISTRIBUTION OF BENIGN NEOPLASMS**

BENIGN NEOPLASM	NO OF CASES	PERCENTAGE
FOLLICULAR ADENOMA	8	67%
HURTHLE CELL ADENOMA	4	33%
TOTAL	12	



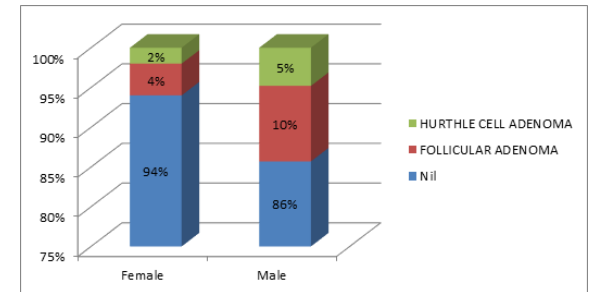
**Age distribution**

The peak age incidence was 20-50 years for follicular adenoma and 6<sup>th</sup> decade for Hurthle cell adenoma



**Sex distribution**

Adenoma was found to common in males. Male to female ratio was 2.5:1

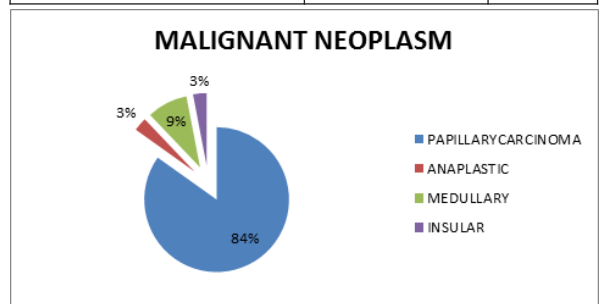


**MALIGNANT NEOPLASM**

Out of 32 malignant neoplasms, there were 27 cases of papillary carcinoma (85%),1 case of anaplastic carcinoma(3%), 3 cases of medullary carcinoma(9%),1 case of insular carcinoma(3%). Papillary carcinoma constitutes about 67.5% of all thyroid neoplasms

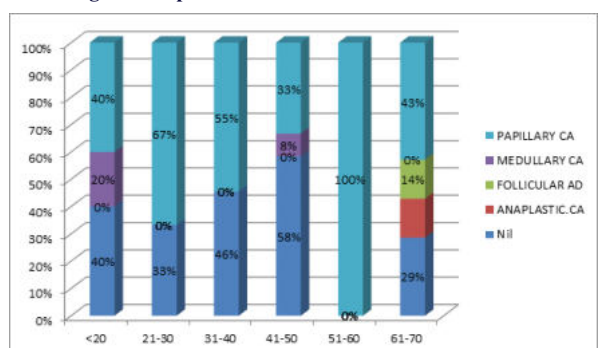
**DISTRIBUTION OF MALIGNANT NEOPLASM**

Malignant neoplasm	Cases	Percentage
PAPILLARY CARCINOMA	27	85%
ANAPLASTIC CARCINOMA	1	3%
MEDULLARY CARCINOMA	3	9%
INSULAR CARCINOMA	1	3%
	32	



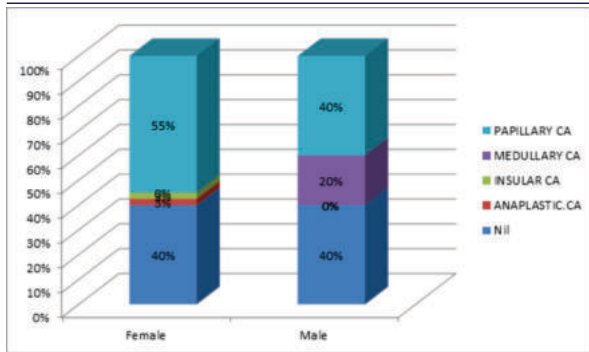
**Age distribution**

The malignant neoplasms were common in 3<sup>rd</sup> to 5<sup>th</sup> decade.



**Sex Distribution**

The malignant neoplasms were common in males.



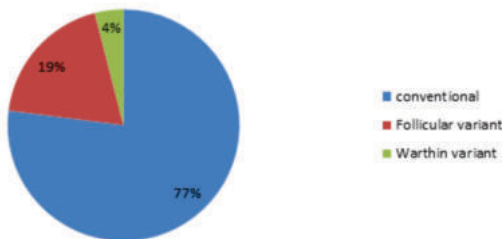
**PAPILLARY CARCINOMA**

Out of 27 cases of Papillary carcinoma of thyroid, 21 cases were conventional, 5 cases Follicular variant of papillary carcinoma, 1 case of warthin variant of papillary carcinoma.

**variants**

Subtypes of PTC	No.of cases	Percentage
Conventional	21	77%
Follicular variant	5	19%
Warthin variant	1	4%
	27	

**Subtypes of PTC**

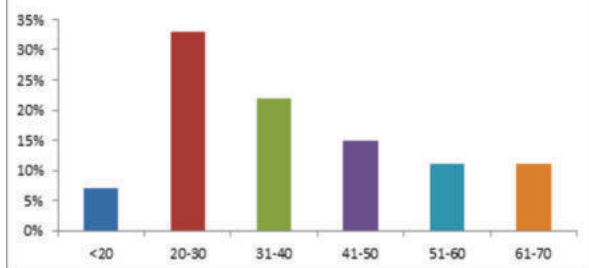


**Age distribution**

Maximum age incidence of papillary carcinoma of thyroid, during 3<sup>rd</sup> and 4<sup>th</sup> decade of life.

Age Group	Frequency	Percent
<20	2	7.4
20-30	9	33.3
31-40	6	22.2
41-50	4	14.8
51-60	3	11.1
61-70	3	11.1
Total	27	100.0

**age distribution for Papillary carcinoma**



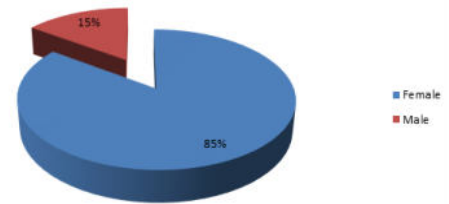
**Sex distribution**

Among the sex, the females are more affected. Male:female ratio is 1:8

**SEX DISTRIBUTION OF PAPILLARY CARCINOMA**

SEX	CASES	PERCENT
Female	24	85%
Male	3	15%
Total	27	100%

**SEX DISTRIBUTION OF PAPILLARY CARCINOMA**



**MEDULLARY CARCINOMA**

Among the malignant neoplasm, there were 3 cases of medullary carcinoma. Male to female ratio of 2:1 (2 cases were male of 17 years and 44 years. 1 case was 25 year female.)

**ANAPLASTIC CARCINOMA**

Only one case of anaplastic carcinoma was reported, female with age of 70 years

**POORLY DIFFERENTIATED CARCINOMA**

Only one case of insular carcinoma was reported, female with age of 68 years.

**DISCUSSION:**

The incidence of solitary thyroid nodule is common among the 4-7% of adult population. Solitary nodule were more common in females. The malignancy incidence is more common in males. The proportion of thyroid nodules that prove to be malignant is 10% to 15%(5)

Manmadha Rao V, Ashok P, Sanjay M, et al Study (6), Out of 151 cases, 133(88.08%) solitary thyroid nodules are benign, 18(11.92%) are malignant. Out of 18 malignant cases, 11 (61.11%) are papillary thyroid carcinoma, 6(33.33%) are follicular thyroid carcinoma, 1 (5.55%) is medullary thyroid carcinoma. The peak age incidence of SNT is in the fourth decade of life (52 cases) and fifth decade (37 cases) followed by third decade (27 cases). The youngest being 15 years old girl and the oldest being 75 years old woman. Mean age is 39.10. The peak age incidence of malignancy in SNT is in the fifth decade of life (7 cases).

The incidence of malignancy in SNT is 11.92%. In our study the incidence of malignancy is 18.72%

Although, female patients outnumbered the males, the incidence of carcinoma in male patients is much higher, 5 times more than in female patients. The peak age incidence of malignancy in SNT is in the fifth decade of life (7 cases).

Chetan V R et al <sup>7</sup> studied among 73 cases of SNT, colloid goitre- 32 cases,43.8%, FA 24 cases-32.9%, PTC 9 CASES -12.3%, follicular carcinoma-3 cases,4.1%, MNG 3 cases-4.1%. Incidence of malignant lesions 12(16.5%) benign 61(83.5%). Among the malignant cases 8/12 were males (66.6%), 4/12 were females (33.3%) .

A. Ravi kamal kumar et al <sup>8</sup> in a study of 126 cases of SNT found ,Benign lesion of 85.17% { FA-52.38% (66 cases), colloid goiter-24.60%(31 cases), cyst-4.76%(6), hashimoto's thyroiditis -3.96%(5)} malignant lesions of 14.29% {(PTC-77.78%(14 cases, FC- 22.22%( 4 cases)}. Among the malignant cases 11.11%males(6/18),33.33% females(12/108)

In our study the highest age incidence of SNT is between 20 -49 years of age.

**COMPARATIVE AGE INCIDENCE OFSNT**

	Fenn et al <sup>9</sup>	Nagori et al <sup>10</sup>	Ananthakrishnan et al <sup>11</sup>	Ravi kamal kumar <sup>8</sup>	Present study
<20	18	11	39	5	12
20-29	81	25	167	50	42
30-39	122	29	150	56	39
40-49	74	21	81	10	47
50-59	38	8	46	5	16
>60	9	6	20	0	15
TOTAL	342	100	503	126	170

Out of 32 malignant cases, 10 cases lies between the age group of 21-30 years. Female outnumbered the males with a ratio of 7.5:1

The percentage of benign and malignant cases in our study is benign (81.28%) and malignant-18.72%. The present study results are similar to that of Chetan et al<sup>7</sup> study. The other studies has been tabulated below

	Psarras et al <sup>34</sup>	Nagori et al <sup>35</sup>	Ananthakrishnan et al <sup>36</sup>	Khadikar et al <sup>37</sup>	Tsegaye et al <sup>38</sup>	Chetan et al <sup>7</sup>	Ravi kamal kumar et al <sup>8</sup>	Present study
Benign	88.3%	89%	84.7%	79%	91.8%	83.5%	85.7%	81.28%
Malignant	11.7%	11%	15.3%	21%	8.2%	16.5%	14.29%	18.72%

Malignant neoplasm

Papillary carcinoma

Papillary carcinoma is the common malignant neoplasm of thyroid. The incidence of papillary carcinoma was 31.25% of all malignant thyroid neoplasm. Among the SNT the incidence was 84.5%. It is the highest incidence among the other studies, which has been tabulated below

**COMPARATIVE STUDY OF INCIDENCE OF PTC**

	Anandhakrishnan et al <sup>11</sup>	Tsegaye et al <sup>12</sup>	Khadikar et al <sup>13</sup>	Ravi kamal kumar et al <sup>8</sup>	Chetan et al <sup>7</sup>	Present study
PTC	46.8%	76.6%	38.29%	77.78%	28.7%	84.5%

In our study the peak age incidence of PTC in the 3<sup>rd</sup> to 5<sup>th</sup> decade (22/32 cases)

Out of 26 cases of papillary carcinoma, 20 cases were conventional, 5 cases were follicular variant of papillary thyroid carcinoma, 1 case of warthin variant.

**MEDULLARY CARCINOMA**

Anandhakrishnan et al<sup>11</sup>, Taegaye et al<sup>12</sup>, Khadikar et al<sup>13</sup>, found that the incidence of medullary carcinoma was 5.2%, 1.5%, 2.94% respectively. Present study shows the incidence of 6.81% Comparative study of incidence in medullary carcinoma

	Anandhakrishnan et al	Tsegaye et al	Khadikar et al	Present study
Medullary carcinoma	5.2	1.5	2.94	6.81%

In present study Male to female ratio is 2:1. Kishore et al 14 study showed the male to female ratio of 1:2.

**ANAPLASTIC CARCINOMA**

Anaplastic carcinoma constitute about 5-10% of all thyroid malignancies. Anandhakrishnan et al<sup>11</sup> and kishore et al<sup>14</sup> noticed about 3.9% and 3.27% respectively.

**INSULAR CARCINOMA**

Pilotti et al<sup>15</sup> and Volante et al<sup>16</sup> found the incidence of 4% and 6.3% respectively, mean age of 53 years and 57 years in Insular carcinoma. In our study the age was 68 year, female

**BENIGN NEOPLASM**

Out of 12 cases, 8 cases were follicular adenoma, 4 cases were Hurthle cell adenoma.

Incidence of benign neoplasm is less in present study when compared with the literature.

**Comparative Incidence of adenoma**

	Fenn et al <sup>9</sup>	Nagori et al <sup>10</sup>	Ananthakrishnan et al <sup>11</sup>	Khadikar et al <sup>37</sup>	Chetan et al <sup>7</sup>	Ravi kamal kumar et al <sup>8</sup>	Present study
Adenoma	54.97%	44%	53.3%	13%	32.9%	52.38%	7.01%

**SUMMARY AND CONCLUSION**

A total of 643 thyroid specimens, 171 cases were solitary nodule thyroid during the study period from June 2014 to May 2016 were subjected to histopathology and were classified according to the WHO classification

The incidence of solitary thyroid was 13.29% with an age incidence of 3<sup>rd</sup> to 5<sup>th</sup> decade. Females are more commonly affected, but male has the

higher incidence for malignancy. Right lobe is more commonly affected

Among the solitary thyroid lesions, neoplastic lesions about 19% of which benign neoplasm constitutes about 81.28%, malignant lesions were 18.72%. The commonest malignant neoplasm was papillary carcinoma constitute about 84.5%.

Comparative study shows statistically significant of malignancy in our study among solitary thyroid lesions.

**DISCUSSION:**

The proportion of thyroid nodules that prove to be malignant is 10% to 15%. 4

The proportion of thyroid nodules that prove to be malignant is 10% to 15%. 4, 6, 4) 7)

[8] Ananthakrishnan N, Rao KM, Narasimhan R, et al. The single thyroid nodule, South Indian profile of 503 patients with special reference incidence of malignancy. Indian J Surg 1993;55(10):487-492.

Manmadha Rao V, Ashok P, Sanjay M, et al. Incidence of carcinoma thyroid in solitary thyroid nodule and prevalence of different types of thyroid malignancy: prospective study in a tertiary care hospital. J. Evid. Based Med. Healthc. 2018; 5(24), 1849-1851. DOI: 10.18410/jebmh/2018/386

The mean age of patients with malignancy in SNT is 39.72 years with range from 15-70 years. Peak incidence was observed in fifth decade Out of 151 cases, 133(88.08%) solitary thyroid nodules are benign, 18(11.92%) are malignant. The peak age incidence of SNT is in the fourth decade of life (52 cases) and fifth decade (37 cases) followed by third decade (27 cases). The youngest being 15 years old girl and the oldest being 75 years old woman. Mean age is 39.10. There are 132 cases of females and 15 out of them are malignant. There are 19 cases of males and 3 out of them are malignant. The incidence of malignancy in SNT is 11.92%. Although, female patients outnumbered the males, the incidence of carcinoma in male patients is much higher, 5 times more than in female patients. The peak age incidence of malignancy in SNT is in the fifth decade of life (7 cases). The Result “:).

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