

A PROSPECTIVE STUDY OF PREVALENCE OF MALIGNANCY IN SOLITARY NODULE OF THYROID IN GEMCH, PERUNDURAI TAMILNADU

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Abstract

Background: The most common endocrine problem is Thyroid nodules. Solitary nodule is a discrete swelling or an impalpable gland. It has high likelihood of turning to malignancy. Proper evaluation will help in starting the optimum management. **Aim:** The aim of the study is to find the prevalence of malignancy among solitary nodular goitre (SNG) in Erode Medical College and hospital. **Materials and Methods:** This is a cross sectional study done in the Department of Surgery in the Erode Medical College & Hospital, Perundurai for one year from Feb 2022 to Jan 2023. The study participants who fulfilled the inclusion and the exclusion criteria were included in this study. Demographic details like name, age, sex, presentation was noted. Clinical examination and thyroid swelling examination were done. Thyroid profile, Fine needle aspiration, ultrasound neck, chest x-ray and indirect laryngoscopy were done. The collected data was entered in the MS excel and statistics were done with SPSS 23. Categorical variables expressed in numbers and percentages and continuous variables were expressed in terms of mean and standard deviation. P value <0.05 is considered as significant. **Result:** The mean age of the study participants was found to be 45 ± 16.2. The minimum age was found to be 16 and maximum was found to be 98 years. Female predominance is observed in our study (39) 78%. Nodular colloid goitres were observed in 19 patients, Follicular neoplasm in 8 & Papillary carcinoma in only one patient. In the present study, 32 patients (64%) had benign condition, 8% had inflammatory disease in thyroid and 14 patients (28%) diagnosed with malignancy. Prevalence (28%) of malignancy among solitary nodular goitre was 28% with female preponderance. **Conclusion:** It is concluded from the present study that 28% of solitary thyroid nodules are malignant, with female preponderance. Since prevalence (28%) of malignancy among solitary nodular goitre was high so we need to evaluate all the SNG and do surgical intervention to reduce morbidity and mortality.

INTRODUCTION

A separate swelling in an impalpable gland is known as Solitary thyroid nodule (STN). It is seen in 8% of the adult population. The detection of thyroid nodules was done through ultrasound and thus it can be increased many folds.^[1,2,3,4] The incidence was more common in females compared to males. Approximately 5% of the thyroid nodules will develop into thyroid cancers. Thyroid nodules can be either benign and malignant. Solitary thyroid nodule

has a high probability of converting into malignant. So, classifying them accurately will help in managing them correct.^[5]

The solitary nodule will present in the lobe which will be connected by the isthmus, located below the thyroid cartilage in front of the neck. It can be either due to the asymmetrical enlargement of one lobe of the thyroid as in Hashimoto's thyroiditis, leading nodule of the multinodular goiter, unilateral agenesis or ectopic tissue which may be due to the developmental errors.^[6,7]

Latest data states that the thyroid malignancy incidence was found to increase over the years. Malignancy potential was found to be more in solitary thyroid nodules compared to Multinodular goiter.^[8,9] Due to this reason solitary thyroid nodules have to be treated with high degree of suspicion and the treatment was planned accordingly.

Distinguishing the thyroid nodule to benign and malignancy in done preoperatively. This helps us to prevent unnecessary extensive surgery and surgery related adverse effects like hypocalcaemia, hypothyroidism and recurrent laryngeal nerve injury. Thus, the aim of this study is to find out the incidence of malignancy in solitary nodule cases in our tertiary care center.

MATERIALS AND METHODS

Study Setting

This study was conducted in the Department of Surgery, Inpatient ward, Government Erode Medical College and Hospital. The study was done for a period of one year from Feb 2022 to Jan 2023.

Study design: Cross sectional study

Sample Size

The study participants fulfilling the inclusion and the exclusion criteria were included in the study throughout the study period. The final attained sample is 100.

Inclusion Criteria

- All the patients admitted in the Surgical ward of the Department of General surgery who are diagnosed to have solitary nodule of both the sexes.

Exclusion Criteria

- Patients with family history of thyroid cancers
- Patients with multinodular thyroid swelling and diffuse thyroid swelling
- Pregnant females
- Patients taking treatment for Diabetes mellitus, psychiatric problems
- Patients with bleeding disorders and on anticoagulant treatment
- Patients hypersensitive to local anaesthetic drugs

Data Collection Method

After obtaining the Institutional Ethical Committee clearance, study was started after obtaining patients consent. The study participants recruited during the study period i.e 100 will undergo the routine investigations and then the preanesthetic fitness. The baseline demographic details like patients name, age, sex, clinical presentation were noted. Clinical examination and thyroid swelling examination were done. Thyroid profile, Fine needle aspiration, ultrasound neck, chest x-ray and indirect laryngoscopy were done.

Statistical Analysis

The obtained data was entered in the MS Excel Windows 10. Statistical analysis was done with the help of SPSS 23. Continuous data was expressed in terms of Mean and Standard deviation. Categorical

data was expressed in terms of Numbers and percentages. Test of association for Categorical data was Chi square test was used. p value <0.05 is considered to be statistically significant.

RESULTS

This study was conducted on 50 patients who came to the Department of Surgery as out patients with Solitary thyroid nodules at Government Erode Medical College.

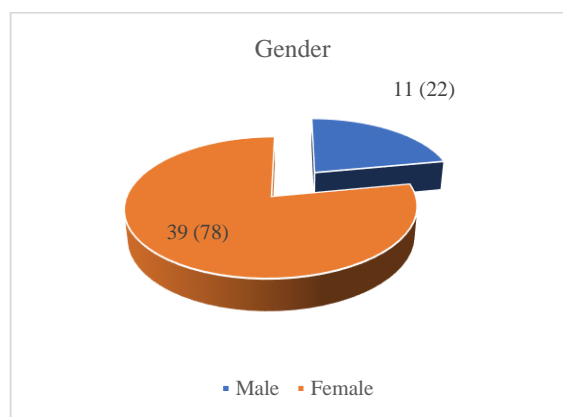


Figure 1: Sex distribution among participants.

Figure 1 depicts, Females (39) were found to be more affected with solitary nodular goiter than their male (11) counterparts.

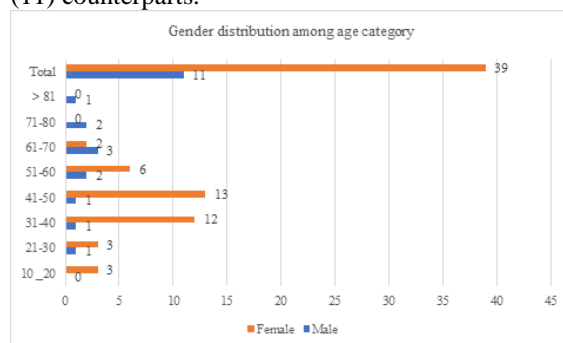


Figure 2, Gender distribution among age category (N=50)

Figure 2 shows, around 50% of patients belonged to 31 to 50 years of age and majority of them were females. This observed difference was found to be statistically significant (p value 0.008).

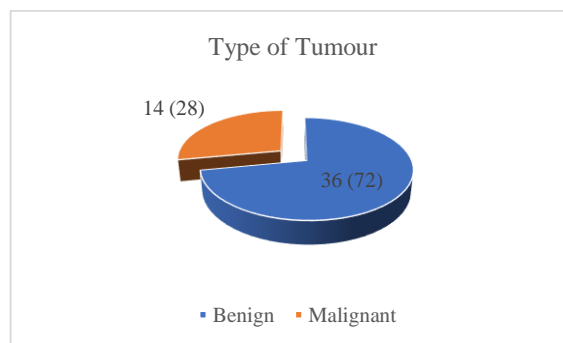


Figure 3: Types of tumours among patients with solitary nodular goiter

Figure 3 shows, out of the 50 study subjects, 36 patients (72%) had benign nodules, malignancy was detected in 14 (28%) patients. The prevalence of malignancy in this study was 28%.

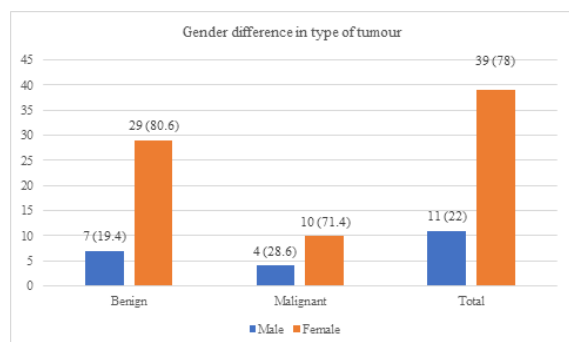


Figure 4: Distribution of gender difference with types of tumour among patients with solitary nodular goiter

Figure 4 shows, out of the 50 study subjects, malignancy was detected in 14 (28%) patients. Out of these 14 patients, 10 were females. Thus, malignancy was also found to be more prevalent amongst the female gender. Out of these 14 patients, 10 were females. Thus, malignancy was also found to be more prevalent amongst the female gender but it was not statistically significant (0.484).

Table 1 shows, Age distribution among study participants. Around 50% of patients belonged to 31 to 50 years of age. The mean age was found to be 45 yrs with standard deviation 16.2. Minimum age was 16 yrs & maximum is 98yrs.

Table 1: Age distribution among patients with solitary nodular goitre (N=50)

Age distribution (in years)	Number	Percentage
10-20	3	6
21-30	4	8
31-40	13	26
41-50	14	28
51-60	8	16
61-70	5	10
71-80	2	4
≥ 81	1	2
Total	50	100

Table 2: Histopathology report of patients with solitary nodular goitre (N=50)

Histopathology report	Number	Percentage
Benign -		
Adenomatous goitre	1	2
Benign colloidal nodule	2	4
Benign cystic lesion of thyroid	2	4
Benign nodular goitre	1	2
Colloid goitre	1	2
Nodular colloid goitre	19	38
Nodular colloid goitre with cystic changes	5	10
Nodular colloid goitre with toxic changes	1	2
Benign total	32	64
Inflammatory -		
Hashimoto thyroiditis	4	8
Malignant -		
Hurthle Cell carcinoma	4	8
Follicular neoplasm	8	16
Papillary carcinoma	1	2
Poorly differentiated squamous cells with calcified deposits in thyroid	1	2
Malignant total	14	28

Table 2 depicts, histopathology report of patients. Nodular colloid goiters were observed in 19 patients, nodular colloid nodular goiter with cystic changes & toxic changes were 25, Follicular neoplasm in 8 & Papillary carcinoma in 1 patient. In the present series, 32 patients (64%) had benign condition, 8% had inflammatory disease in thyroid and 14 patients (28%) diagnosed with malignancy.

Table 3 shows, among 50 patients 76% had right side goiter, only 30% had lymphadenopathy and 14% had X ray calcification. Thyroid hormone status of patients. Routine thyroid function test (TFT) was done in all patients. Mean TSH, T3, T4 were 2.4 + 1.06, . 3.7+ 0.68, 1.4 + 0.35. All patients were in Euthyroid state. Cystic changes found in only 20% of patients in ultrasound.

Table 4 depicts, Tumour distribution among investigation and examination findings of solitary nodular goiter patients. Among them cystic changes found in the ultrasound scan found only in benign and it was statistically significant (p 0.027).

No statistically significant association between gender and USG, X ray findings, lymphadenopathy. No statistically significant association between tumour and USG and X ray findings, lymphadenopathy.

No statistically significant association between side of lesion and pathological findings.

Table 3. Investigation and examination findings of solitary nodular goitre patients (N=50)

Investigation and examination findings	Number	Percentage
Side of goitre		
Right side	38	76
Left side	12	24
Lymphadenopathy	15	30
Thyroid hormone profile		
Euthyroid	50	100
X ray Calcification	7	14
USG Cystic changes	10	20

Table 4: Tumor distribution among investigation and examination findings of solitary nodular goitre patients (N=50)

Characteristics	Benign (%)	Malignant (%)	Total	Chi square value	P value
Side of goitre				1.463	0.226
Left	7 (58.3)	5 (41.7)	12		
Right	29 (76.3)	9 (23.7)	38		
Lymphadenopathy	13 (86.7)	2 (13.3)	15	2.286	0.131
X ray calcification	5 (71.4)	2 (28.6)	7	0.001	0.971
USG Cystic changes	10 (100)	0	10	4.861	0.027 *

* Statistically significant

DISCUSSION

In this present study, the mean age was found to be 45 years with standard deviation 16.2. Minimum age was 16 years & maximum is 98yrs. Around 50% of patients belonged to 31 to 50 years of age majority of them were females. Females (39) were found to be more affected than their male (11) counterparts. According to a study done by Shanta Patil et al^[10], mean age was found to be 40.62 years. Minimum age was 12 years and maximum age was 65 years. Majority were belonged to of 41-50 years of age and Females (42) were found to be more affected than the males (8) which was comparable with our findings. Palani et al^[11] also mentioned in a study that mean age was 35 years, range were 10-60 years and most commonly observed in females. Akhtar et al^[12] and a study done in Salem¹³ also observed comparable results. But this Salem study stands in contrast with the point that more males are affected with SNG than females.

In this current study reveals, out of the 50 study subjects, histopathology report of patients. Nodular colloid goitres were observed in 25 patients, colloid goitre in 1 patient, Follicular neoplasm in 8 patients, papillary carcinoma in 1 patient. 36 patients (72%) had benign nodules, malignancy was detected in 14 (28%) patients. The prevalence of malignancy in this study was 28%. Out of these 14 patients, 10 were females. Thus, malignancy was also found to be more prevalent amongst the female gender. Shanta Patil et al^[10] observed, of the 50 patients, colloid goitres were observed in 10 patients, Nodular goitre in 25 patients. Follicular adenoma and papillary carcinomas were diagnosed in 6 & 8 patients. 41 patients (82%) had benign nodules, with 9 patients (18%) diagnosed with malignancy. Out of these 9 patients, 8 were females. Thus, malignancy was also found to be more prevalent amongst the female gender in their study too. Prevalence of malignancy was 18%. Malignancy rate (18%) was less when compared with our study (28%). Palani et al^[11]

revealed that prevalence of malignancy in solitary thyroid nodule was more in females. colloid goitres were observed in 17 patients, followed by Nodular goitre in 13 patients. There were 10 patients who had Follicular adenoma. Of the 50 specimens examined, 9 were papillary carcinomas, 1 was follicular carcinomas. The prevalence of malignancy in the present series is 20%. Papillary carcinoma is the commonest malignancy of Solitary Thyroid nodule 9 (90%) of the total of 10 malignancies. But this stands in contrast with our present study which was follicular neoplasm. Prevalence of malignancy was almost similar with our present study. Akhtar N et al¹² & Babu R et al^[14] study, malignancy in solitary thyroid nodule showed 19 (15.3%) and 10.83% respectively.

In our present study, 76% had right side goitre, only 13% had lymphadenopathy and 28% had X ray calcification in malignancy patients. Tumour pathology with investigation didn't have statistical significance. Cystic changes found in only 20% of patients in ultrasound. Among them cystic changes found in the ultrasound scan found only in benign and it was statistically significant (p 0.027). A study done in Salem by Rajasekar et al^[13] revealed, Majority of them had right side solitary nodule. Out of 50 patients, 13 (26%) of them had lymphadenopathy and 21 of them had calcification. More calcification among malignant cases revealed statistically significant results (p<0.005).

Routine thyroid function test (TFT) revealed all are in euthyroid state. Mean TSH, T3, T4 were 2.4 ± 1.06, 3.7± 0.68, 1.4 ± 0.35. All patients were in Euthyroid state. Palani et al^[11], Routine thyroid function test (TFT) was done in all patients and all were found to be in euthyroid state which was similar with our present study. Shanta Patil et al^[10] observed, Routine thyroid function test (TFT) was done in all patients. 48 patients (96%) were Euthyroid at presentation whereas 2 patients (4%) were hyperthyroid at presentation.

Limitations of the Study

Smaller sample size affects the generalizability of the findings.

CONCLUSION

It is concluded from our study that, 28% of solitary thyroid nodules are malignant, with female preponderance. Nodular colloid goitres were observed in 19 patients, nodular colloid nodular goitre with cystic changes & toxic changes were 25, Follicular neoplasm in 8 & Papillary carcinoma in only one patient. In the present study, 32 patients (64%) had benign condition, 8% had inflammatory disease in thyroid and 14 patients (28%) diagnosed with malignancy. Since prevalence (28%) of malignancy among solitary nodular goitre was high so we need to evaluate all the SNG and do surgical intervention to reduce morbidity and mortality by thyroid carcinoma.

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Competing Interest

There is no Competing interest

Authors Contribution

All authors in our study contributed to the data collection of the patients

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