

CLINICAL AND HISTOPATHOLOGICAL PROFILE OF PATIENT WITH SOLITARY THYROID NODULE IN TERTIARY CARE HOSPITAL IN SOUTH INDIA

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ABSTRACT

BACKGROUND

Incidence of malignancy in a solitary thyroid nodule is higher than in multinodular goitre. The prevalence of nodules in the general population is around 8% with greater predisposition in females. This study was undertaken to study the functional status of solitary nodules and to analyse the types of malignancy occurring in solitary nodules.

MATERIALS AND METHODS

This cross-sectional study was done among patients who presented with anterior neck swelling and diagnosed as Solitary Thyroid Nodule in SRM Medical College Hospital and Research Centre, SRM Nagar, Kattankulathur, Kancheepuram Dist., Tamilnadu. Clinical, laboratory and histopathological evaluation of patients was done for confirmation of findings.

RESULTS

Total of 50 cases of Solitary Thyroid Nodule were studied. The age of the patients ranged from 22 years to 66 years (Mean age= 38.44 years). Solitary Nodule of Thyroid was more common in females. The distribution of nodule either on right or left side was almost equal. The size of the nodule varied from 2 cm to 7 cm. Most patients (38) presented with a size between 2 to 4 cm. Based on histopathological confirmation 4 out of the 50 patients were found to have malignancy, which comprised 8% of the study population. Follicular adenoma was present in 24% of the patients. Adenomatous goitre was present in 62% of the patients and simple cysts in 2% of the patients.

CONCLUSION

This study shows that Solitary Nodule of Thyroid is more common in females and in 3rd to 5th decades of their age. Incidence of Malignancy in Solitary Nodule of Thyroid is 8%. Histopathology reports proved that Papillary Carcinoma is most common malignancy in patients with solitary nodule.

KEYWORDS

Solitary Thyroid Nodule, Incidence of Malignancy, Papillary Carcinoma.

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BACKGROUND

Diseases of thyroid gland are the most common among endocrine glands. One of the common presentations of thyroid diseases is nodular thyroid swelling. Thyroid nodules are found in 4% - 8% of adults by palpation and in 13% - 67% when ultrasound detection is used.¹ The usual presentation of a thyroid nodule is asymptomatic and is either discovered by the patient or clinician. Nodules of at least 0.5 cm to 1 cm can be detected usually by palpation, although estimates of nodule size varies from physician to physician.² Thyroid nodules develop at the edge of thyroid glands and present a

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challenge in their diagnosis, evaluation, treatment and management. FNAC is the most crucial step in the evaluation of a thyroid nodule and is the procedure of choice in the workup of thyroid nodule.³

A Solitary Nodule is defined as "a palpable single clinically detected nodule in the thyroid gland that is otherwise normal."⁴ A thyroid nodule larger than 1 cm in diameter is usually palpable. The detection of a nodule by palpation depends on its location within the thyroid gland, on the structure of the patient's neck and on the experience of the examiner. Majority of thyroid nodules are benign. In 1975 Gogas JG and Skalheas GD in their study on 1300 thyroidectomies, of which 70 had carcinoma.⁵ The incidence of malignancy in solitary nodule was 9.7%. Overall incidence of malignancy in solitary thyroid nodule ranges from 10% - 30%.⁶ Papillary thyroid cancer (PTC) is identified in 87% of solid nodules, 7% of mixed composition nodules and 6% of predominantly cystic nodules.³

Lymphomas and metastatic tumour can also occur in solitary thyroid nodules, but less frequently. Thyroid cancer

has a favourable prognosis and accounts for less than 0.5% of cancer deaths.⁷ The recent data suggests that the incidence of thyroid malignancy is increasing over the years.^{8,9} The occurrence of malignancy is more in solitary thyroid nodules compared to multinodular goitre.^{10,11} This increase in incidence is due to identification through the use of ultrasound examinations and the emphasis on early detection of cancer over the past three decades.¹²

The occurrence of solitary thyroid nodule is a common entity. Clinically, palpable nodules are reported in 8% of the adult population. With the use of imaging techniques, particularly ultrasound, the chance of detection of thyroid nodules has increased many folds.^{13,14} Solitary thyroid are seen approximately in 4% to 7% of the population in iodine sufficient areas with a markedly increased incidence in iodine-deficient regions.¹⁵ The prevalence of palpable thyroid nodule in South India is about 12.2%.¹⁶

Thyroid nodules occur at all ages. The reported age ranges from 15 - 69 years with maximum incidence in 30 - 40 years. Solitary nodule is rare in children, the incidence of carcinoma in such a nodule under 25 years of age is about 50% and 75% in patients under 15 years. Solitary nodule found in thyroid of patients less than 20 years and greater than 60 years carries far greater risk of being malignant.

Solitary nodule of thyroid can arise from diverse causes. The common causes of solitary thyroid nodules are adenomatous goitre, neoplasms and chronic thyroiditis. The aetiology of the nodule depends upon the population under study, sex, age of patient and prior history of exposure to ionising radiation. Factors such as parity, early menopause, contraceptive use and late age at first birth in female population have been reported to have increased risk of thyroid carcinoma, but the data has been inconsistent. The thyroid nodule is more likely to be a cancer in men than in women and in young (under 20 years) and older (over 60 years) patients rather than others.

Thyroid ultrasound features associated with malignancy in thyroid nodules are microcalcifications, hypoechogenicity, irregular margins or absent halo sign, solid areas, intranodular vascularisation.¹⁷ Thyroid ultrasonography is the recognised "Gold standard" for an accurate and reliable assessment of gland volume and thyroid nodules.¹⁸ FNAC also plays a crucial role in diagnosis of type of Solitary thyroid nodule.

Since there is a high risk of malignancy in STN than in multiple nodules, STN have to be treated with high degree of suspicion and plan treatment in a systematic manner. The optimal management of the thyroid nodule continues to be a source of controversy and the operative intervention recommended by most surgeons is not always considered divine by some physicians advocating either observation or suppression.¹⁹ This study was undertaken to study the incidence of Euthyroid, Hyper and Hypothyroid states in solitary nodules with proven malignancy and to analyse the types of malignancy occurring in solitary nodules and its surgical management. The aim of the study is also to determine the incidence of solitary thyroid nodule in relation to age and sex.

MATERIALS AND METHODS

This cross-sectional study was done among patients who were admitted in SRM Medical College Hospital and Research

Centre, SRM Nagar, Kattankulathur, Kancheepuram Dist., Tamilnadu. The duration of study was eighteen months. As per inclusion criteria, patients who presented with anterior neck swelling and diagnosed as solitary thyroid nodule and patients with recurrent nodule were included in the study. Patients below 16 years of age and patients diagnosed with multinodular goitre were excluded from the study. Total sample size for this study was 50 patients. Thorough history and clinical examination including cervical lymph nodes was done. Laboratory evaluation was done for assessing the TSH, free T3, free T4 and Thyroglobulin Assay of patients. For all patients ultrasonogram examination was done to evaluate the size, shape, composition and calcification of thyroid nodule. FNAC was also done for the patients. All the patients were managed surgically and diagnosis was confirmed from the histopathological examination reports.

RESULTS

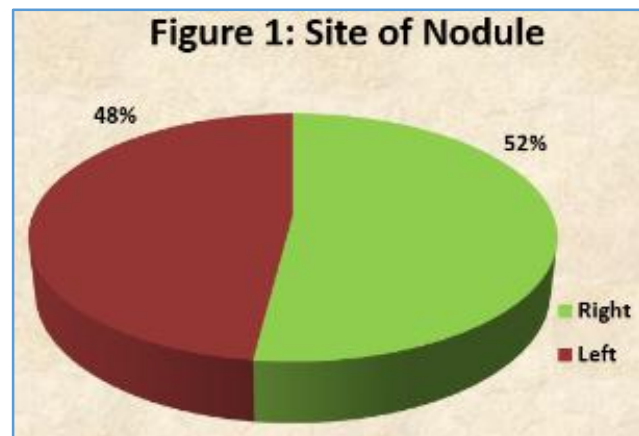
Total of 50 cases of solitary thyroid nodule were studied. The age of the patients ranged from 22 years to 66 years with peaks beginning in 3rd to 5th decades. Mean age of presentation is 38.44 years; 3rd to 5th decades constitute >70% of the cases studied. Solitary nodule of thyroid are more common in females. Out of 50 cases studied, 40 were females and 10 were males. The ratio was observed to be 1:4 (Males: Females).

| Variable | Frequency | Percentage |
|---------------------|-----------|------------|
| Age in Years | | |
| 20-29 | 16 | 32 |
| 30-39 | 16 | 32 |
| 40-49 | 7 | 14 |
| 50-59 | 6 | 12 |
| 60-69 | 5 | 10 |
| Sex | | |
| Males | 10 | 20 |
| Females | 40 | 80 |

Table 1. Age and Sex Distribution of Study Participants

Site of the Nodule

Out of 50 cases studied, 26 cases presented with nodules in the right lobe and the remainder in the left lobe. One patient among left-sided solitary nodule had undergone right hemithyroidectomy ten years prior and presented with a recurrent nodule on the left side.

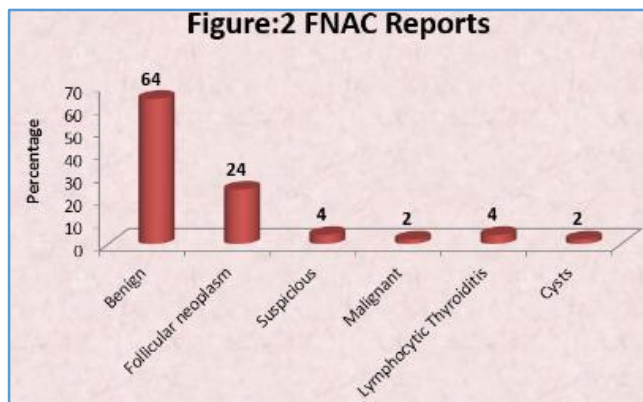


Size of the Nodule

In this study, on clinical examination, size of the nodule in its largest dimension varied from 2 cm to 7 cm. Most patients (38) presented with a size between 2 and 4 cm. For 9 patients, size was between 4 and 5 cm, 2 patients between 5 and 7 cm and in one patient the size was less than 2 cm. Out of the 50 cases, all of the cases presented to the General Surgery OPD in Euthyroid state. Amongst these, two patients were on treatment for Hypothyroidism (Thyroxine) prior to admission. Both of these were free from malignancy.

FNAC Reports

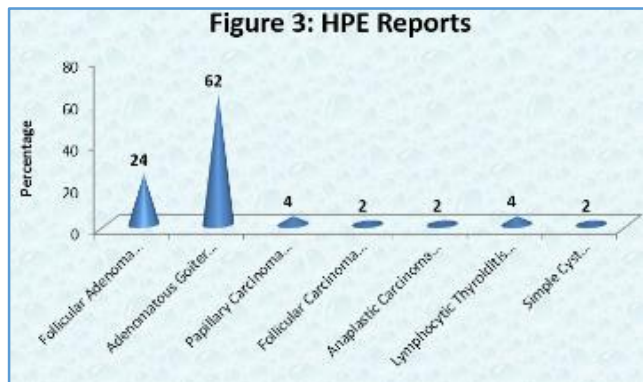
FNAC reports of patients revealed Benign in 64%, Follicular neoplasm in 24%, Suspicious in 4%, Malignancy in 2% and Lymphocytic thyroiditis in 4% of patients.



Incidence of Malignancy

4 out of the 50 patients were found to have malignancy, which comprised 8% of the study population. Two of them had papillary carcinoma and two of them had anaplastic carcinoma. Of the four malignant cases, two were correctly identified by FNAC and the remaining two cases were reported as suspicious by FNAC. One out of the four malignancies observed was from the Kancheepuram district (14 out of 50 patients were from the district). There was no observed obvious increase in the incidence of malignancy around the Kalpakkam nuclear plant.

Follicular adenoma was present in 24% of the patients. Adenomatous goitre was present in 62% of the patients and simple cysts in 2% of the patients.



DISCUSSION

The present study is a cross-sectional analysis of 50 cases of Solitary Nodule of Thyroid admitted in SRM MCH and RC, Kattankulathur. The findings of this study were compared to

those done previously. In this study, the mean age of incidence (38.44 yrs.) is similar to the previously done studies with the majority of patients being between the 3rd and 5th decades. Das DK (1999)²⁰ reported mean age as 35 yrs., Talipoor M (2005)²¹ reported mean age as 38.6 yrs. and Khurshid Anwar (2012)²² reported mean age as 37 yrs. Naz Aktar in his study on solitary thyroid nodule reported that most of the patients are between 21 - 40 years of age, i.e. 64.5%.²³

Already literatures have proven that thyroid nodules can be found in up to 90% of women over the age of 60 years. They are 3 - 4 times more frequent in women than men.²⁴ In the present study, the ratio of Male: Female was observed as 1:4 and is similar to that observed by Gupta C in 2001 (1:5).²⁵ Das DK (1999)²⁰ reported 1: 5.3 as sex ratio of solitary thyroid nodule and Dorairajan (1996)⁴ reported sex ratio of patients presenting with solitary thyroid nodule as 1: 9. The occurrence of thyroid nodule formation is very high in females as compared with male counterparts due to fluctuations in the demands of the hormonal requirement in their life cycle (puberty, menstrual cycles, pregnancy and menopause).²⁶

Fine Needle Aspiration Cytology is an important investigating tool in the evaluation of solitary nodule of thyroid. It is recommended that every patient with a palpable thyroid nodule should undergo an FNAC. All 50 cases were subjected to FNAC during the course of evaluation. FNAC reports are mainly categorised into 6 entities. Benign, follicular neoplasm, suspicious (of malignancy), malignant, lymphocytic thyroiditis and cysts. In the present study, FNAC reports of patients revealed Benign in 64%, Follicular neoplasm in 24%, Suspicious in 4%, Malignancy in 2% and Lymphocytic thyroiditis in 4% of patients. Out of four malignancies that were confirmed by histopathology, two cases were correctly reported by FNAC and the remaining two cases were reported as suspicious. A study done by Jena et al¹¹ reported that fine-needle aspiration cytology done before the surgery on 146 patients, the findings were nodular goitre in 62 (42.5%), follicular neoplasm in 55 (37.7%), papillary carcinoma in 25 (17.1%), Hashimoto thyroiditis in two (1.4%), toxic nodule in one (0.7%) and medullary carcinoma in one (0.7%) patient.

The actual incidence of malignancy was found to be at 8% in the present study based on histopathological reports. Fenn et al (1980)²⁷ reported incidence of 12%, Bhansali SK (1982)²⁸ reported 9% as incidence, Kapur et al (1982)²⁹ and Rehman AU (2009)³⁰ reported 11% as incidence of malignancy among patients with solitary nodule (Table 2). Naz Aktar in his study reported a higher prevalence of malignancy (15.3%) in solitary nodule.²³

| Study | Percentage |
|----------------------|-------------|
| Fenn et al(1980) | 12% |
| Bhansali SK (1982) | 9.0% |
| Kapur et al (1982) | 11.0% |
| Rehman AU (2009) | 11.4% |
| Present Study | 8.0% |

Table 2. Incidence of Carcinoma in Thyroid Nodule from Various Study Reports

One out of the four cases of malignancy observed was from the Kancheepuram district out of a total of 14 cases. Overall, we see that the findings observed in this study are

more or less similar to the ones observed by other researchers in various parts of the country.

CONCLUSION

This study shows that Solitary Nodule of Thyroid is more common in females. Solitary Nodule of Thyroid is more common in the 3rd to 5th decades. Most of the patients present with swelling alone. Most of the patients are in Euthyroid state with a few in Hypothyroid. Incidence of Malignancy in Solitary Nodule of Thyroid is 8%. Histopathology reports proved that Papillary Carcinoma and anaplastic carcinoma are in equal proportion among patients with solitary nodule. This study emphasises the need for early diagnosis and treatment of solitary thyroid nodule.

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