

## Original Research Article

**A Clinical Study of Incidence of Malignancy in Solitary Nodule of Thyroid**Dr. T. Karthiyayini<sup>1</sup>, Dr. S.K. Sridhar<sup>2</sup><sup>1</sup>Senior Assistant Professor, Department of Surgery, Tirunelveli Medical College Hospital, Tirunelveli, Tamil Nadu<sup>2</sup>Professor, Department of Surgery, Thirunelveli Medical College Hospital, Tirunelveli, Tamil Nadu**\*Corresponding author**

Dr. T. Karthiyayini

Email: [karthiyayini.dr@gmail.com](mailto:karthiyayini.dr@gmail.com)

**Abstract:** Solitary nodule of thyroid has increased in incidence in the present day as compared to two decades earlier. Because of possibility of malignancy, some clinicians especially those in surgical subspecialties recommended that all thyroid nodules have to be removed. Objectives of the Study: To determine the incidence of adenoma, carcinoma and thyroiditis as a cause of solitary nodule of thyroid in Thirunelveli Medical College Hospital (Tvmch), Tirunelveli. The study of minimum 50 cases selected by Random Sampling Technique of those admitted to surgical ward of Tvmch, Tirunelveli during the period of September 2014-August 2015. Data collection by meticulous history taking and clinical examination, appropriate laboratory and radiological investigations, operative findings, histopathological report and follow up of cases. The common causes of solitary nodule were MNG (36%), follicular adenoma (22%) adenomatous goiter (24%), 94% of cases presented with Euthyroid state. Incidence of malignancy in solitary thyroid nodule was 12%. Male to female ratio in case of malignant nodule was 1:5. Incidence of carcinoma in males presenting as solitary nodule was higher (25%) compared to that females (10.87%). The most common cause of malignancy was papillary carcinoma (67%) followed by follicular carcinoma (33%). Common cause of solitary nodule of thyroid are MNG, follicular adenoma and adenomatous goiter. Incidence of malignancy in male patients presenting with solitary nodule of thyroid is more when compared to female. The most common cause of malignancy in solitary nodule is papillary carcinoma followed by follicular carcinoma.

**Keywords:** solitary nodule, malignancy, euthyroid. Papillary carcinoma

**INTRODUCTION:**

Thyroid nodules are very common entities, though varying in incidence in different geographical regions, the prevalence of palpable nodule in general population is 4.7% Solitary nodules of thyroid are about four times more common in males. Overall incidence of malignancy in solitary thyroid nodule range from 10 - 30% [1]. A single nodule in the thyroid is a definite clinical entity with important pathological significance. It is necessary to consider the status of opposite lobe when considering the 'solitariness' of the nodule. Ignoring palpability of opposite lobe is likely to lead to a higher incidence of solitary nodule turning out to be multi-nodular goiter [2]. Another factor that influences the ultimate histopathological outcome of solitary nodule of solitary nodule thyroid is whether the definition of solitariness is entirely clinical or proved by investigations like ultrasonogram (USG), radio iodine scan etc. In general a solitary nodule is defined as "a

palpable single clinically detected nodule in the thyroid gland that is otherwise normal." Visibility or palpability of opposite thyroid lobe precludes inclusion of such cases in this group [3]. The usual presentation of a thyroid nodule is an asymptomatic mass that is discovered by either the patient or the clinician. Nodules of at least 0.5 cm to 1 cm can be usually be detected by palpation, although estimates of nodule size varies from physician to physician. It can be difficult to palpate any nodule in patient with a short neck. The thyroid nodule has been subject of vigorous controversy with divergent opinions expressed by those who had wide experience in this field [4]. The optimal management of thyroid nodule continues to be a source of controversy and the operative intervention recommended by most of surgeons is not always considered divine by some physicians advocating either observation or suppression. The importance of discrete swelling lies in the risk of neoplastic compared with

other thyroid swellings [5]. Some 15% of isolated swelling proves to be malignant. Follicular adenoma is clinically dominant swelling in approximately half of truly isolated swelling, it is substantial and cannot be ignored. Because of possibility of malignancy, some clinicians especially those in surgical subspecialties' recommend that all nodules have to be removed. On the other hand endocrinologist recommends FNAC performed as initial step of evaluation in order to avoid unnecessary surgery.[6]

**MATERIALS AND METHODS:**

The present study on “Clinical Study of the incidence of malignant changes in Solitary Nodule of Thyroid” has been conducted by utilizing cases admitted and managed in the Department of Surgery at Tirunelveli Medical College Hospital. Prospective analysis of 50 cases of solitary nodule thyroid in the specified period was done. These cases were selected by random sampling method and studied in detail clinically and recorded as per the proforma. Routine investigations and specific investigations including FNAC of the nodule, Thyroid profile, IDL(Indirect Laryngoscopy), Plain X-ray neck, USG neck were done in all cases, special investigations like radio-isotope scanning was not performed as the facilities were not available. All the patients were managed by surgery and diagnosis was confirmed by histo-pathological examination. The patients were grouped according to different variables like age, sex, size of the nodule, functional thyroid status, FNAC reports and histo-pathological examination reports, then analysed and compared with the previous similar studies conducted elsewhere. Finally conclusions were drawn accordingly.

**RESULTS:**

Total of 50 cases of solitary nodule of thyroid was studied and following conclusions were drawn the age of the patient's ranges from 18 years to 66 years, with peaks being in 3rd to 5th decades. The mean age of presentation is 37.24 years. A case in 3rd to 5th decades constitutes 60% of the cases studied. Solitary nodule of thyroid is much more common in females. Out of 50 cases studied 46 were females and 4 were males, and the ratio comes to M: F =1: 11.5. Also the malignant nodules are common in females. Out of 6 cases of malignancy in the study 5 were females.

**Table: 1 shows the Duration of symptoms:**

| Duration of Symptoms | Number of patients |
|----------------------|--------------------|
| <1mon                | 1                  |
| 1-3mon               | 7                  |
| 3-6 mon              | 10                 |
| 6-12 mon             | 7                  |
| 1-2 yrs              | 12                 |
| 2-5 yrs              | 11                 |
| >5yrs                | 2                  |

In our study, duration of onset symptoms varied from 15 days to 8 years. Also duration of malignant nodules extent from 1 month to 4 years.

**Table: 2 Site of the nodule:**

| Site of the nodule | No. of patients |
|--------------------|-----------------|
| Right              | 26              |
| Left               | 24              |
| Total              | 50              |

Out of 50 cases studied. 26 cases presented with nodule in right lobe of the thyroid gland and 24 cases presented with nodule in the left lobe of thyroid. One patient among left sided solitary nodule had undergone right lobectomy 30 yeas back and presented with recurrent nodule in the rest of the lobe.

**Table: 3 Size of the nodule**

| Size of the Nodule | No. of patients |
|--------------------|-----------------|
| <1 cm              | 0               |
| 1-2 cm             | 2               |
| 2-3 cm             | 8               |
| 3-4 cm             | 15              |
| 4-5 cm             | 13              |
| 5-6 cm             | 8               |
| 6-7 cm             | 2               |
| >7 cm              | 2               |

In the present study, on clinical examination size of the nodule, in its largest dimension varies 2cm to 12cm. Most of the patients presented with the size of about 3 to 5 cm in the study, as such there is no correlation between the size of the nodule and the occurrence malignant nodule.

**Table: 4 FNAC Reports:**

| FNAC reports            | No. of patients |
|-------------------------|-----------------|
| Benign                  | 32              |
| Follicular Neoplasm     | 11              |
| Suspicious              | 1               |
| Malignant               | 3               |
| Lymphocytic Thyroiditis | 1               |
| Cysts                   | 2               |
| Total                   | 50              |

Fine Needle Aspiration Cytology is an important investigating tool in the evaluation of solitary nodule of thyroid. All 50 cases were subjected to FNAC during the course of evaluation. FNAC reports are mainly categorized into 6 entities. Benign, follicular neoplasm, suspicious (of malignancy), malignant, lymphocytic thyroiditis and cysts. In our study, out of 11 follicular neoplasms, two turned out to be follicular carcinoma. One FNAC report suspicious of malignancy was confirmed as a case of papillary carcinoma on histopathological examination. Three cases of papillary carcinoma were diagnosed pre-operatively by FNAC alone. Two cases diagnosed as cysts by FNAC confirmed to be simple cysts on histopathological examination.

**Table: 5 Type of carcinoma:**

| Carcinoma  | No. of cases | Percentage |
|------------|--------------|------------|
| Papillary  | 4            | 67         |
| Follicular | 2            | 33         |
| Medullary  | 0            | 0          |
| Anaplastic | 0            | 0          |
| Lymphoma   | 0            | 0          |
| Total      | 6            | 100        |

From the study, out of 6 carcinoma, 4 were papillary and 2 follicular, no case of medullary or anaplastic or lymphoma was detected. Papillary carcinoma accounts to 67% and follicular carcinoma accounts to 33%.

**DISCUSSION:**

In the study done by Quari F and Talepo M separately in 2005, reported the mean age at presentation as 36.7 years and 38.6 years respectively. Khurshid Anwar reported, in 2012, the mean age of presentation as 37 years [7]. From the present study, the mean age a presentation found to be 37.27 years, correlates with the previous studies. Most of the earlier series reported peak incidence of solitary nodule thyroid in the 3rd and 4th decades. Bhansah S.K 5 (1982), in his similar study, reported the peak incidence in 4th and 5th

decade [8]. In the present study, the peak incidence found to be in 3rd to 5th decades, which constitutes about 60% of the case studied. In the study done by Dorairajan (1996) and Das DK (1999) reported ratio of sex incidence as 1:9 and 1:5:39 respectively. In the present study, it's found to be 1:11.5, which correlates with previous studies. Because of periods of fluctuations in the demands of the hormonal requirement in female in their life cycle (puberty, menstrual cycles, pregnancy, menopause), the chances of thyroid nodule formation are very high as compared with male counterparts [9]. Distribution of non-neoplastic and neoplastic lesions diagnosed by FNAC in the present study, neoplastic conditions include adenomas and all malignant lesions [10]. From the study, the ratio of non-neoplastic cases is about 2.57:1, which is comparable to the studies done earlier like Karur (2002), Hutado Lopez M(2005), Nagada (2006), Chao CT (2007) Distribution of malignancies by FNAC in the present study, among 4 cases of papillary CA, 3 were diagnosed with certainty by FNAC and the rest one was suspicious of malignancy [11]. But both the follicular CA was initially reported as follicular neoplasm. From the study, distribution of malignancy is about 7.27, which is comparable with the earlier studies. From the present study, commonest cause of solitary nodule is MNG, which is comparable with the studies done by Fenn (1980), Kapur (1982), Bhansali (1982) [12]. The common causes are follicular adenoma and adenomatous goitre. From the literature, the incidence of malignancy in thyroid nodule ranges from 5% to 30%. From the present study, the incidence found to be 12%, which is comparable with the study done by A S Fenn *et al.*; Kapur *et al.*; Rehman AU [13].

**CONCLUSIONS:**

Solitary nodule of thyroid is more common in females Solitary nodule of thyroid is more common the age group of 20-50 years. Most of the patients with solitary nodule of thyroid present with swelling alone. Most of the patients with solitary nodule of thyroid are in euthyroid state and only few present with toxicity and hypothyroidism. Incidence of malignancy in male patients presenting with solitary nodule thyroid is more when compared to female patients presenting with the same [14]. Commonest cause of solitary nodule of thyroid is multi-nodular goitre. USG can be used to detect multi-nodular goitre in patients presenting with solitary nodule thyroid. FNAC is the investigation of choice in the evaluation of solitary nodule of thyroid. It has few pitfalls. In such situations, only histopathology can confirm the exact pathology. It detects papillary carcinoma in solitary nodule with high sensitivity and specificity. Papillary carcinoma is the most common

malignancy of thyroid, followed by follicular carcinoma [15].

**REFERENCES:**

1. Cole WH, Majarakis JD, Slaughter DP. Incidence of carcinoma of the thyroid in nodular goiter. *The Journal of Clinical Endocrinology & Metabolism*. 1949 Oct; 9(10):1007-11.
2. Bentley AA, Gillespie C, Malis D. Evaluation and management of a solitary thyroid nodule in a child. *Otolaryngologic Clinics of North America*. 2003 Feb 28; 36(1):117-28.
3. Harrison BJ, Maddox PR, Smith Dm. Disorders of thyroid gland. In: Cuschieri A, Steele RJC, Moossa AR, editors. *Essential surgical practice*. 4th ed. London: Arnold; 2002: 95-110.
4. Dorairajan N, Jayashree N. Solitary nodule of the thyroid and the role of fine needle aspiration cytology in diagnosis. *J Indian Med Assoc* 1996 Feb; 94(2):50-2.
5. Burch HB. Evaluation and management of the solitary thyroid nodule. *Endocrinol Metab Clin North Am* 1995 Dec; 24(4):663-94.
6. Belfiore A, Rosa GL. Fine needle aspiration biopsy of the thyroid. *Endocrinol Metab Clin North Am* 2001 June; 30(2):361-94.
7. Krukowski ZH. The thyroid gland and the thyroglossal tract. In: Russel RCG, Williams NS, Christopher JK, Bulstrode, editors. *Bailey and love's Short practice of surgery*. 24th ed. London: Arnold, 2004: 776-805.
8. Oertel YC. Fine needle aspiration and the diagnosis of thyroid cancer. *Endocrinol Metab Clin North Am* 1996 Mar; 25(1):69-90.
9. Orlo H, Clark, Nadine R. Caron, Thyroid disorders. In: *Mastery of Surgery*. Josef E. Fischer, editor, 5th edition. p.398
10. Skandalakis JE, Gray SW (eds). *Embryology and anatomy for Surgeons*, 2nd Ed. Baltimore: Williams & Wilkins, 1994.
11. Pearse AGE, Polak JM. Cytochemical evidence for the neural crest origin of mammalian ultimobranchial C cells. *Histochemie* 1971; 27:96.
12. Skandalakis JE, Gray SW (eds). *Embryology for Surgeons*, 2nd Ed. Baltimore: Williams & Wilkins, 1994;
13. Gray SW, Skandalakis JE. *Embryology for Surgeons* (1st ed). Philadelphia: Saunders, 1972.
14. Kamat MR, Kulkarni JN, Desai PB, Jusswalla DJ. Lingual thyroid: a review of 12 cases. *Br J Surg* 1979; 66:537.
15. Gray SW, Skandalakis JE, Androulakis JA. Nonthyroid tumors of the neck. *Contemp Surg* 26:13-24, 1985.