THE STUDY OF CLINICAL PRESENTATION OF SOLITARY NODULE THYROID

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ABSTRACT

BACKGROUND

Thyroid disorders are the most common endocrine disorder seen in clinical practice and solitary thyroid nodule is one of the common presentations of thyroid disease. A discrete swelling in an otherwise impalpable gland is termed isolated or solitary nodule of thyroid.[1] The prevalence of thyroid nodule increases from near zero at 15 years to 50% by about 60 to 65 years on sonography. At most 10% of these nodules are palpable even by experienced clinicians. This study is about the clinical presentation, histopathology and management of solitary nodule thyroid in MGM GH Tiruchirappalli.

AIMS AND OBJECTIVES**-** To determine the age and sex incidence among the cases of solitary nodule thyroid. To study the percentage of euthyroid, hypothyroid or hyperthyroid state in patients presenting with solitary nodule thyroid. To study the proportion of malignant and benign cases among the solitary nodule thyroid at M.G.M. Govt. Hospital, Tiruchirappalli.

MATERIALS AND METHODS

This study includes 58 cases of solitary nodule of thyroid noted during the period Jan 2016-Dec 2016. Factors were tabulated and analysed statistically.

RESULTS

From the present study, the mean age at presentation found to be 42.5 years with preponderance to females. 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. From the study, distribution of malignancy is about 10.34. The incidence of malignancy found to be 12%, sensitivity is 87.5%, specificity is 100% for FNAC and HPE.

CONCLUSION

Majority of the patients are between 30-49 years of age. Incidence of solitary thyroid nodule is more common in female. Female: male ratio is almost about 15:1 Commonest symptom is swelling over anterior or lateral aspect of neck Among the benign lesion dominant nodule is most common and papillary and follicular carcinoma are common in malignant lesion.

KEYWORDS

Solitary nodule, FNAC, USG, Follicular Neoplasm.

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BACKGROUND

Thyroid disorders are the most common endocrine disorder seen in clinical practice and solitary thyroid nodule is one of the common presentations of thyroid disease. A discrete swelling in an otherwise impalpable gland is termed isolated or solitary nodule of thyroid.[1] The prevalence of thyroid nodule increases from near zero at 15 years to 50% by about 60 to 65 years on sonography. At most 10% of these nodules are palpable even by experienced clinicians.[2] At autopsy, up to 30% of thyroid nodule harbour malignant nodules under 1 cm, termed microcaricinomas[3] A nodule is more likely to be a carcinoma in a man.[4] Many solitary nodules are found asymptomatically, but because of their size and position can result in obstructive symptoms of trachea and oesophagus (dyspnoea and dysphagia).[3] The major concern relates to the potentiality for malignancy of solitary nodule. Whether nodule size itself is a risk factor for malignancy is controversial. Fine needle aspiration biopsy is the single most important test in the evaluation of patients with thyroid swelling.[5] Ultrasound is helpful for differentiating solid from cystic nodules, and for identifying lymphadenopathy[6] Decision on surgical management relies on careful analysis of the clinical findings, risk assessment, imaging, and diagnostic testing.[7,8] Most of the patients are treated by hemithyroidectomy and patients with malignancy and multi nodular goitre are

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treated by total thyroidectomy with MRND if lymph nodes are positive and total thyroidectomy if there are no lymph nodes.

Aims and Objectives

1. To determine the age and sex incidence among the cases of solitary nodule thyroid.
2. To study the percentage of euthyroid, hypothyroid or hyperthyroid state in patients presenting with solitary nodule thyroid.
3. To study the proportion of malignant and benign cases among the solitary nodule thyroid at M. G. M. Govt. Hospital, Trichy.

MATERIALS AND METHODS

Study Place- Mahatma Gandhi Memorial Hospital and KAPV Govt. Medical College. Trichy.

Duration of Study- One year (January 2016 – December 2016).

Study Design -Prospective Study.

Inclusion Criteria

1. All cases of solitary nodule thyroid presenting to general surgery OPD at M. G. M. Govt. Hospital, Trichy.
2. Age>14 years.
3. Both Sex.

Exclusion Criteria

1. Recurrent Nodule.
2. Age<14 years.
3. Patient with diffuse enlargement of thyroid.
4. MNG.

Data Collection and Methods

Patients admitted with features of solitary nodule thyroid at Mahatma Gandhi Memorial Hospital Trichy were included in the study. History evaluation with structured questionnaire along with Radiological analysis was done. Clinical features were noted for all patients by using structured questionnaire and the patients were followed up after management for outcome and complications.

Statistical Analysis

Data was analysed by using SPSS 17 software with appropriate statistical test.

This study includes 58 cases of solitary nodule thyroid in the specified period time. These cases are clinically diagnosed with solitary nodule of thyroid. Routine investigations and specific investigations including FNAC of the nodule, Thyroid profile, IDL, 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 histopathological 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. Finally conclusions were drawn accordingly.

Treatment- Pre-operative- Use of anti-thyroid drugs, beta-blockers, blood transfusions or any other medications were prescribed based on individual status and was noted. Operative: Position of the patient, type of anaesthesia, incision, type of operation planned, per- operative findings and type of operation performed were recorded.

Post-operative- Every patient was followed up post-operatively during the course of management in the hospital to note the development of and management of complications.

Follow-up- At the time of discharge, all the patients were advised to attend the surgical OPD regularly for follow up. Any recurrences or complications were noted. Thyroid functional status was assessed, accordingly thyroxine tablets prescribed if necessary.

RESULTS

Total of 58 cases of solitary nodule of thyroid studied and following conclusions were drawn.

Age Incidence- The age of the patients ranges from 20 years to 60 years, with peaks being in 3rd to 5th decades. The mean age of presentation is 42 years. Cases in 3rd to 5th decades constitutes 58% of the cases studied.

Age Group	Frequency	Percentage
0-9	0	0
10-19	1	1.7%
20-29	9	15.5%
30-39	13	22.4%
40-49	21	36.2%
50-59	9	15.5%
>60	5	8.6%
Total	**58**	**100.0%**

Table 1. Age Distribution

Incidence- Solitary nodule of thyroid are much more common in females. Out of 58 cases studied 55 were females and 3 were males, and the ratio comes to M: F = 1: 15. Also the malignant nodules are common in females. Out of 7 cases of malignancy in the study, 6 were females.

Sex	Frequency	Percentage
Male	3	5.2%
Female	55	94.8%
Total	**58**	**100%**

Table 2. Sex Distribution

Clinical Features- All the cases in the present study presented with complaint of swelling in the region of the thyroid. Only few patients presented with pain and discomfort. All the mentioned additional symptoms were of mild degree. Out of 58 cases, 3 cases had pain, 3 cases had discomfort. Also none of the patient had lymphadenopathy which was confirmed by

ultrasonographic examination. Two patients had symptoms of thyrotoxicosis, and one had features of hypothyroidism. The latter patients thyroid profile confirmed the functional status.

Duration of Symptoms- In our study, duration of onset symptoms varied from 1 month to 6 years. Also duration of malignant nodules extend from 1 month to 4 years.

Duration	Frequency	Percentage
1-3 months	4	6.9%
4-6 months	21	36.2%
7-9 months	17	29.3%
10-12 months	9	15.5%
1-2 years	4	6.9%
3-5 years	2	3.4%
>5 years	1	1.7%
Total	**58**	**100.0%**

Table 3. Symptoms Duration

Size of the Nodule- In the present study, on clinical examination size of the nodule, in its largest dimension, varies from 2 cm to 10 cm. 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.

Size	Frequency	Percentage
2-3 cm	15	25.9%
3-4 cm	19	32.8%
4-5 cm	12	20.7%
>5 cm	12	20.7%
Total	**58**	**100.0%**

Table 4. Variation in Size of Nodule

Thyroid Functional Status- Out of 58 cases, two presented with features of thyrotoxicosis, one with hypothyroidism and rest all were in euthyroid state. Patients with thyrotoxicosis were made euthyroid using anti thyroid drugs and operated and both cases turned out to be toxic follicular adenoma. Patient with hypothyroidism was treated with thyroxine, USG neck revealed multiple nodules and managed by total thyroidectomy, histopathological examination confirmed the diagnosis of multi-nodular goiter.

Thyroid Functional Status	Frequency	Percentage
Euthyroid	55	94.8%
Hypothyroid	1	1.7%
Hyperthyroid	2	3.4%
Total	**58**	**100.0**

Table 5. Thyroid Functional Status

USG Findings- USG can be used to detect dominant nodule of multi-nodular goiter (38%) in patients presenting with solitary nodule thyroid.

USG findings	Frequency	Percentage
Single nodular goiter (SNG)	35	60%
Dominant nodule of Multi nodular goiter (MNG)	22	38%
Cystic	1	2%
Lymph nodes	2	
Total	**58**	**100.0%**

Table 6. USG Findings

FNAC Reports- Fine Needle Aspiration Cytology is the important investigation in the evaluation of solitary nodule of thyroid. All 58 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, cysts. In our study, out of 7 follicular neoplasms, one turned out to be one follicular carcinoma. Six cases of papillary carcinoma were diagnosed pre- operatively by FNAC alone. One cases diagnosed as cyst by FNAC confirmed to be simple cyst on HPE.

FNAC Reports	Frequency	Percentage
Benign	44	76%
Follicular neoplasm	7	12%
Malignant	6	10%
Cyst	1	2%
Total	58	100.0%

Table 7. FNAC Report

Solitary Nodule of Thyroid	Frequency	Percentage
Benign	51	88%
Malignant	7	12%
Total	**58**	**100%**

Table 8. Incidence of Malignancy in Solitary Nodule

From the study, incidence of malignancy in solitary nodules is 12%

Type of Carcinoma- From the study, out of 7 carcinoma, 6 were papillary and 1 follicular, no case of medullary or anaplastic or lymphoma was detected. Papillary carcinoma accounts to 86% and follicular carcinoma accounts to 14%.

Type of Carcinoma	Number of Cases	Percentage
Papillary	6	86
Follicular	1	14
Medullary	0	0
Anaplastic	0	0
Lymphoma	0	0
Total	**7**	**100**

Table 9. Type of Carcinoma

Surgery/Operative Procedure Done- Depending upon the clinical diagnosis and FNAC features, all the 58 patients undergone surgery. Among them, 35 patients had undergone hemi-thyroidectomy, 16 cases underwent total thyroidectomy as the solitary nodule is the dominant nodule of MNG with benign cytology and one case with follicular neoplasm had biopsy report as follicular carcinoma

who underwent completion thyroidectomy after 12 weeks. Among 6 cases of papillary carcinoma 4 underwent total thyroidectomy and 2 cases with USG positive lymph nodes underwent total thyroidectomy with MRND. Post-operatively, suppressive dose of thyroxine was started for patients who had undergone total thyroidectomy. 8 cases out of 23 cases of total thyroidectomy showed features of hypocalcaemia on 2-4 post-operative day, hence, they are supplemented with oral calcium and vitamin D3. All the cases were followed up for 6 months, two cases had husky voice without any change in vocal cord movements.

FNAC	HPE		Total
	Malignant	Benign	
Malignant	6	0	6
Benign	1	51	52
Total	**7**	**51**	**58**

Table 10. FNAC Vs. HPE

Sensitivity = True positive/ (True positive + False Negative) x 100= 6/7 x 100 = 85.7%.
Specificity = True Negative/ (True Negative + False positive) x 100 = 51/51 x 100 = 100%.
Positive predictive value = True Positive/(True Positive+ False positive) x 10
= 6/6 x 100
= 100%.
Negative predictive value= True Negative/(True Negative + False Negative) x 100 = 51/52 x 100
= 98%.

From the present study, the sensitivity of FNAC was 87.5% while the overall specificity was 100% as all malignancy reported on FNAC confirmed by HPE.

Accuracy of FNAC Findings	
Sensitivity	- 85.7%
Specificity	-100%
Positive predictive value (PPV)	-100%
Negative predictive value (NPV)	- 98%

DISCUSSION

From the present study, the mean age at presentation found to be 42.5 years. The peak incidence found to be 3rd to 5th decades, which constitutes about 58% of the cases studied. 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. the ratio of non-neoplastic to neoplastic cases is about 3.46:1. Among 6 cases of papillary CA, 6 were diagnosed with certainty by FNAC. One case of follicular CA were initially reported as follicular neoplasm. From the study, distribution of malignancy is about 10.34. the incidence of malignancy found to be 12%, sensitivity is 87.5%, specificity is 100% for FNAC and HPE. Surgery has been the treatment of choice in most of the cases, either because of cosmetic reasons or toxicity or FNAC diagnosis of follicular neoplasm or malignancy. Transient hypocalcaemia is common after total thyroidectomy for malignancies.

CONCLUSION

Majority of the patients are between 30-49 years of age. Incidence of solitary thyroid nodule is more common in female. Female: male ratio is almost about 15:1 Commonest symptom is swelling over anterior or lateral aspect of neck. Majority of patients are euthyroid on presentation. FNAC is first investigation of choice. It is very useful, cost-effective, safe, and simple and has high diagnostic accuracy. It is highly sensitive and specific for diagnosis of thyroid nodule. However, it cannot differentiate between follicular carcinoma and follicular adenoma. USG is a useful diagnostic aid as it helps in distinguishing a cystic and solid nodule and for USG-guided FNAC. It also detect very small nodule clinically impalpable. But it does not help in differentiating benign from malignant nodule. Among the benign lesion colloid goiter is most common and papillary and follicular carcinoma are common in malignant lesion. Minimal surgery performed for solitary nodule is hemithyroidectomy. Modified neck dissection is advised for patients with enlarged nodes in papillary carcinoma and for those pos-op patients who are diagnosed to have malignancy with lymph node metastasis. All the patients with malignant lesion treated with total thyroidectomy with neck dissection and were given suppressive dose of thyroxin post-operatively life-long with regular followup.

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