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RESEARCH ARTICLE

"A CLINICAL STUDY OF INCIDENCE OF MALIGNANCY IN SOLITARY THYROID NODULE IN A TERTIARY CARE HOSPITAL"

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Abstract

Introduction: Thyroid nodules are common entities presenting to the surgical outpatient department. They are defined as 'A discrete swelling in an otherwise impalpable gland.' Incidence of malignancy has been observed to be quite high in solitary thyroid nodules. Thus, they have to be evaluated properly for optimum management. Aim of the study is to identify the incidence of malignancy in solitary nodule thyroid.

Materials and Methods: This study was a prospective non-randomized hospital based interventional study carried out on 50 patients who presented clinically with solitary thyroid swellings who thereby underwent surgery for the disease from August 2020 to July 2022 at the Department of General surgery of our institute.

Results: There were 50 cases of clinically detected solitary thyroid nodule with female preponderance more than males. The mean age of the incidence of solitary thyroid nodule was 40.6 years. The incidence of malignancy in solitary thyroid nodule was found to be 18%.

Conclusions: It is concluded from the present study that 18% of solitary thyroid nodules are malignant, with female preponderance and a mean age of solitary thyroid nodule is 40.62 years.

Introduction:-

Patients presenting to the surgical Out Patient department with nodules of the Thyroid gland are quite common. About 8% of the adult population has clinically palpable nodules of the Thyroid gland. Advances in imaging techniques, especially high-resolution ultrasonography, the rates of detection of clinically impalpable thyroid nodules have increased manifolds[1-7]. The prevalence increases to up to 50% when the examination is combined with an ultrasonography.A Thyroid nodule can be defined as a palpable lesion or a lesion radiologically distinct from the surrounding normal parenchyma of the gland. Depending on the number, the nodules are classified as either solitary or multiple. Solitary nodule can either be single or it can be a dominant nodule in a multinodulargland which cannot be palpated.Solitary nodules occur more frequently in females as compared to males, their prevalence going as far as up to 4 times in the female gender. The nodules can be either asymptomatic and detected on a routine clinical examination or the patient might give a history of a solitary swelling in the front of the neck either of a short duration or more commonly of a longer standing duration.

The presenting nodule can either be benign or malignant. Benign nodules can be simple cysts, thyroid adenoma or colloid nodules. Malignant nodules include papillary carcinoma, follicular carcinoma, medullary carcinoma or secondaries from other sites.Since thyroid nodules are common, their risk of malignancy has to be borne in

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thesurgeon's mind while dealing with it. Thus, identification of patients with significant risk of malignancy is a must and evidence-based guidelines has to be available for the management of these patients. Moreover, Warren H Cole (1949) stated that solitary nodules have significantly higher incidence of malignancy than their multinodular counterparts[8,9].The incidence of Thyroid cancers is approximately 5% in all thyroid nodules, independent of the size of the nodule.Recent data suggests that the incidence of malignancy found in Thyroid swellings is increasing over the years. This could also be attributed to the advancements made in diagnostic modalities and patient awareness about the disease. Because of this reason, solitary thyroid nodules have to be treated with high degree of suspicion and plan treatment in a systematic manner.A comprehensive pre-operative evaluation of thyroid nodules is very much needed to distinguish between benign and malignant nodules. This helps in avoiding unnecessary extensive surgery. Furthermore, potential surgery related adverse effects like hypocalcemia, recurrent laryngeal nerve injury and Hypothyroidism can be avoided.

The aim of the present study was to evaluate the incidence of malignancy in patients presenting with Solitary thyroid nodules and also to determine the incidence of solitary nodule of thyroid with respect to age and gender.

Materials And Methods:-

This study was a prospective non-randomized hospital based interventional study carried out on 50 patients who presented clinically with thyroid swellings who thereby underwent surgery for the disease from August 2020 to July 2022 at the Department of General surgery of our institute.

Inclusion Criteria

1. Patients presenting with solitary thyroid Nodule.
2. Patients between 10 to 70 years of age, both male and female gender.

Exclusion Criteria

1. Patients with thyroid swellings other than solitary nodules i.e. clinically, radiologically and surgically proved multinodular goiter.
2. Cases of Thyroiditis.
3. Patients with previous history of head and neck irradiation.
4. Patients below 10 years of age.
5. Pregnant females.
6. Patients unfit for surgery.
7. Patients not consenting for the interventions.

Data was collected from 50 patients included in the study after applying inclusion and exclusion criteria. Information regarding presenting history of the swelling, history to trace the etiological causative factors of the swelling. Additionally, Past History, history of any co-morbidities, family history of thyroid disease, Drug history and other relevant histories were obtained and documented.

Detailed General physical, systemic and thyroid swelling examination was done. Furthermore, baseline routine blood investigations as well as specific investigations like thyroid profile, fine needle aspiration cytology (FNAC), X-ray of the neck-antero-posterior and lateral views to look for retrosternal extension in larger swellings, High Resolution USG of the neck, chest X-ray and indirect laryngoscopy to ascertain the condition of the vocal cords were done.

Patients who were either in hypothyroid or hyperthyroid state were made euthyroid by medical therapy before undergoing surgery.
To be deemed eligible for inclusion in this study, a solitary thyroid nodule was defined as a single swelling involving either lobe or isthmus of the thyroid gland and with no features of multi-nodularity either clinically, radiologically or post operatively on histopathology.

Patients underwent surgery and the histopathological reports were evaluated and correlated with clinical diagnosis by standard statistical methods.

Results:-

This study was conducted on 50 patients who presented to the Department of Surgery with Solitary thyroid nodules.

Data regarding clinical presentation, findings of various investigations, operative procedure performed and histopathological findings were analyzed.

1. Mean age was found to be 40.62 years
2. Minimum age was 12 years and maximum age was 65 years.
3. The highest numbers of thyroid nodules were seen in the age group of 41-50 years, the mean age of patients was 40.62 years.(Table 1 and figure 1).
4. Females (42) were found to be more affected than their male (8) counterparts. (Table 2).
5. Out of the 50 study subjects, malignancy was detected in 9 patients. Out of these 9 patients, 8 were females. Thus, malignancy was also found to be more prevalent amongst the female gender (Table 3)
6. On Post-op histopathology, colloid goiters were observed in 10 patients, followed by Nodular goiter in 25 patients. (Table 4)
7. In the present series, 41 patients (82%) had benign nodules, with 9 patients (18%) diagnosed with malignancy.
8. The incidence of malignancy in the present series is 18%. (Table 5)
9. Follicular adenoma was diagnosed in 6 patients. (Table 4)
10. Of the 9 malignant specimens examined, 8 were papillary carcinomas whereas 1 was follicular carcinoma (Table 3).
11. In the present series, papillary carcinoma is the commonest malignancy of Solitary Thyroid nodule 8 (89%) of the total of 9 malignancies.
12. All patients (100%) had swelling over the anterior aspect of neck, therefore presented with swelling as chief complaint.
13. 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 (Table 6).
14. In this study, the accuracy of FNAC was 94%. (Table 7).

Table 1:- Age distribution.

Age Distribution	No of Patients	Percentage	Mean
12-20	2	4	40.62
21-30	12	24	
31-40	10	20	
41-50	15	30	
51-60	10	20	
>60	1	2	
Total	50	100	

The age range of patients in this study was from 12 to 65 years. The mean age of presentation was 40.62 years.

Figure 1:- Age distribution.

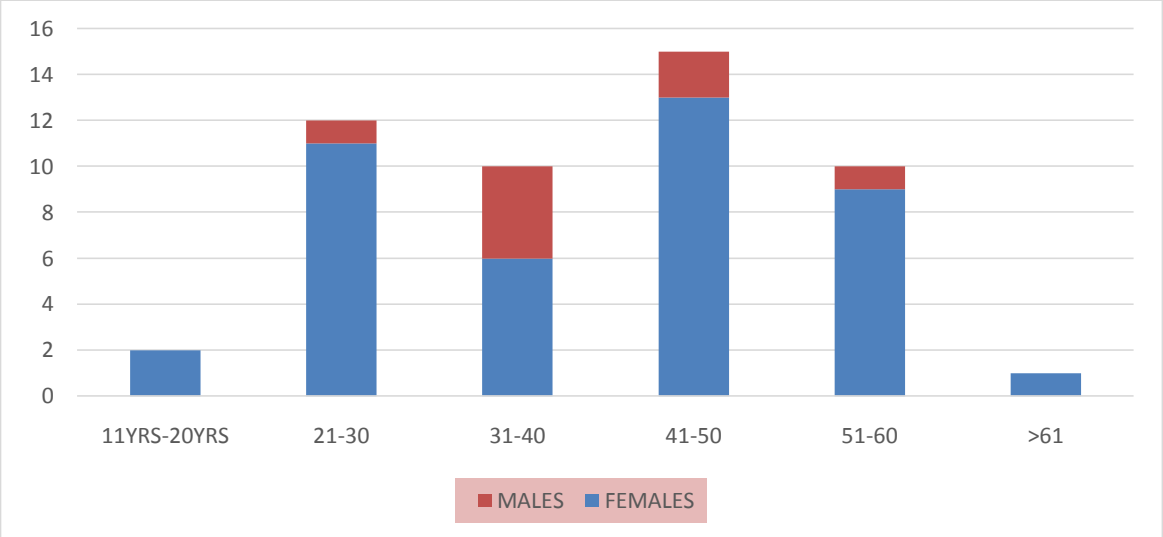

Table 2:- Gender distribution.

Gender	No. of patients	Percentage of total
Female	42	84
Male	8	16
Total	50	100

Table 3:- Gender wise distribution of malignancy.

Gender	Males	Females
Follicular carcinoma	0	1
Papillary carcinoma	1	7
Total	1	8

Out of the 50 study subjects, malignancy was detected in 9 patients. Out of these 9 patients, 8 were females. Thus, malignancy was also found to be more prevalent amongst the female gender

Table 4:- Histopathological examination.

Histopathological Diagnosis	Frequency
Nodular goitre	25
Colloid goiter	10
Follicular adenoma	6
Follicular carcinoma	1
Papillary carcinoma	8
Total	50

Table 5:- Incidence of malignancy.

Diagnosis	Number of cases	Percentage
Benign	41	82%
Malignant	9	18%
Total	50	100%

Out of the 50 cases in our study group, 9 cases (18%) turned out to be malignant

Table 6:- Thyroid hormone profile.

Thyroid Hormone Status	Frequency	Percent
Euthyroid	48	96.0
Hypothyroid	0	0.0
Hyperthyroid	2	4.0
Total	50	100.0

Discussion:-

Solitary thyroid nodules are a rather common presenting complaint to the surgical outpatient having an incidence of 4-7% reported in the general population. Most of these nodules, though, are benign[10,11].The major point of concern for the surgeon in such patients is the potential of a thyroid nodule to be malignant as the incidence of thyroid malignancy in patients with a palpable solitary nodule range from 11% to 20%. Additionally, some authors claim it to be as high as even up to 50%.Historically, surgeons would perform routine surgical removal for every solitary thyroid nodule, but such a radical policy resulted in many patients undergoing unnecessary surgeries for what subsequently turned out to be a benign thyroid lesion.Therefore, it becomes imperative to chart out a more selective surgical policy for patients with solitary nodules of the thyroid gland.For this, at present, fine needle aspiration cytology (FNAC) has attained widespread acceptance as a reliable and widely used diagnostic tool in the diagnostic work up of solitary nodules of the Thyroid gland.

Table 7:- Comparison between Cytological and Histological results.

Cytology	**Histology**		**Total**
	Benign	Malignant	
Benign	41	3	44
Malignant	0	6	6
Total	41	9	50

$$\text{ACCURACY}=\frac{(TP+TN)\times 100}{TP+TN+FP+FN}$$

$$=\frac{(6+41)\times 100}{6+41+0+3}$$

$$= 94\%$$

Veith FJ, Brooks JR, Grigsby WP, et al (1964) reported a series of 299 patients who were found to have solitary thyroid nodules at the time of surgery, the female to male ratio was found out to be 5:1 with a majority them being papillary carcinoma[12].Khairy GA, studied on the surgical and histological data of 172 patients with solitary thyroid nodules who underwent surgery. 13.9% of patients were found to have malignancy of which most of them were papillary type[13].

In the present series, after final histopathological examination, papillary carcinoma was found to be the most frequent diagnosis with 8 out of the 9 cases being diagnosed with it. The remaining 1 were follicular carcinoma.The highest numbers of thyroid nodules were seen in the age group of 41-50years, the mean age of patients was 40.62 years. The patients were spread across the age group with the youngest being of 12 years age and the eldest being 65 years old.The age distribution pattern is important as the incidence of malignancy in solitary nodule thyroid has been noted to be high at extremes of ages therefore the patients younger than 20 years and older than 50 years have to evaluated with high degree of clinical suspicion and the nodules occurring in these patients have to be considered malignant until proven otherwise.

In their study, Akhtar N et al noted that 42.7% of the patients were between 31-40 years. Incidence of malignancy in solitary thyroid nodule was recorded at 15.3%[14].Hossain MA et al, reported male to female ratio of 1:7 and the 31-40 age group had the greatest number of patients with Solitary Thyroid Nodule [15]. The frequency of malignancy in solitary thyroid nodule was observed to be 28% in their study.Babu R et al (2015) studied the incidence of malignancy in solitary nodule thyroid and observed the female-male ratio to be 8:1. The peak age incidence was found to be in the 21-30 years age group with the incidence of malignancy being at 10.83%[16].

Conclusion:-

From this study, done at a tertiary care hospital in Kalaburagi,, we have drawn the conclusion that 18% of solitary thyroid nodules were observed to be malignant, with female preponderance of 5.2:1 and a mean age of presentation of patients with solitary thyroid nodule at 40.62 years.

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