

INCIDENCE OF MALIGNANCY IN SOLITARY THYROID NODULE

SAJID RASHID NAGRA¹, GHULAM DASTGIR KHAN², MUHAMMAD NASRULLAH³,
AYESHA HAYAT⁴, SANA GHAFAR⁵

¹Assistant Professor of ENT, Rai Medical College, Sargodha, ²Consultant ENT, King Fahad Central Hospital Jazan, Saudi Arabia, ³Assistant Consultant ENT, King Fahad Medical City, Riyadh KSA, ^{4,5}3rd Year MBBS Student, Rai Medical College, Sargodha Correspondence: srnagra@hotmail.com

ABSTRACT

Background: Nodular goitre is prevalent in adult population. Usually it is multinodular goitre but a discrete swelling has to be evaluated for risk of neoplasia. Special dilemma is for diagnosis of follicular adenomas and follicular carcinomas.

Objective: To investigate solitary thyroid nodule and its association with malignancy.

Materials and Methods: This prospective study of 145 patients from January 2015 to December 2016, carried out in referral hospital of Saudi Arabia. Only those cases with solitary thyroid nodule were included in the study and then incidence of malignancy evaluated. Sex incidence, age groups along with routine investigations followed by ultrasonography and FNAC carried out in all patients. Thyroid function tests were mandatory before subjecting patients for treatment.

Results: Predominantly (68%) solitary nodule was found in Right lobe of thyroid gland in comparison to left lobe (25%) and in isthmus (07%). Out of these 145 patients, 88.27% were benign while 8.3% malignant and 3.45% were suspicious. Suspicious turned out to be 2.1% benign and 1.4% malignant on biopsy. Nodular goitre (65%) dominated in benign group, followed by Hashimoto's thyroiditis (3%). In neoplastic group, follicular carcinoma (52%) took top slot and papillary neoplasm (23%) on second place. Female to male ratio was 4:1. Age range was from 19 years to 64 years. FNAC was main stay of investigation along with ultrasound neck.

Conclusion: A significant percentage of malignancy is present in solitary thyroid nodule. So its early diagnosis and proper treatment should be ultimate goal to reduce the mortality of the disease.

Key Words: Solitary nodule, Goitre, FNAC, Malignancy

INTRODUCTION

A discrete swelling in one lobe of thyroid without palpable abnormality elsewhere is termed as solitary nodule. Discrete thyroid nodules are common and present in 3-4% of adult population in USA and UK and three to four times more common in females than males. The Importance of discrete nodules lie in the risk of neoplasia compared with other thyroid swellings. Solitary thyroid nodules prove to be malignant and additional 30-40% are follicular adenomas. Remainder is not neoplastic, mainly comprising of cysts, colloid degeneration and thyroiditis. FNAC remains the investigation of choice in discrete thyroid swelling. The Incidence of thyroid carcinoma in females is about 3 times more than in males, but a discrete nodule in a man is more likely to be malignant than in a woman. Risk of malignancy is increased in early and late age group and a discrete nodule in a teenager of both males and females must be provisionally considered as malignant.

Although majority of patients presenting with discrete nodules are females with ages 20 to 40 years. In these patients risk of carcinoma although significant, is low and need for surgery is not very clear but FNAC remains most suitable investigation.¹ If Imaging shows that nodule is solitary, chances of malignancy increases to 5-20%², of these papillary carcinoma is about 80%, follicular carcinoma 10% and medullary carcinoma 5%³, but in another study papillary carcinoma was 60% and follicular carcinoma 18%.⁴ It has been concluded on the basis of several studies that risk of thyroid malignancy is more with solitary nodule than with multiple nodules.^{5,6} Because of this reason, solitary thyroid nodule has to be treated with high degree of suspicion and plan treatment in a systematic manner.⁷

MATERIALS AND METHODS

A prospective study of patients with "Solitary thyroid nodule" was conducted from January 2015 to December

2016, in department of ENT and General Surgery at Najran General Hospital, Najran, Kingdom of Saudi Arabia. Only patients with diagnosis of "Solitary thyroid nodule" were included in this study. Patients with diffuse goiter, multinodular goiter, coexistent neck nodules and children less than 14 years of age were not included in the study. History and physical examination was the initial step of assessment of patient that included general examination of the swelling, its consistency, surrounding areas and any signs of thyroid disease manifestation were checked for in the patients. Age groups from young to old groups were analyzed from ages 19-64. Male to female ratio was kept in view for analysis of disease to see incidence in both sexes accordingly. Routine investigations like complete blood count, urine test, Chest X- Ray, ECG etc. were also done. Thyroid function tests, ultrasound and FNAC was performed in all the cases mentioned. FNAC was the most useful investigation in finding out the differentiation between benign and malignant condition of solitary thyroid nodule. The site of thyroid nodule was observed being in either the right or left lobe of thyroid gland and the duration of symptoms and the presenting features. Bio data of patients was recorded and FNAC was done with a 22 gauge needle. The data was entered and analyzed using SPSS-20.

RESULTS

A total number of 145 patients were included in this study. Out of these 118 (81.37%) were females and 27 (18.62%) were males. (Fig.1). Female to Male ratio is 4:1 and so it is evident that females have a predominance. The age group of our study included patients from age 19 to 64 years, 19 years being the youngest patient from our group of patients and 64 years being the upper limit, (Fig.2). Regarding site of thyroid gland involved, it was revealed that right lobe predominantly involved (66.8%) and in 25.6% of cases, left lobe was afflicted while isthmus was involved in 7.6% of cases, (Table 1). Presenting symptoms included swelling in front of neck of all patients, other symptoms in addition to swelling were sudden increase in size, dysphagia, dyspnoea, change of voice and pain in swelling, (Table 2).

On physical examination, consistency of solitary thyroid nodule, 58.6% were of firm consistency while 31.03% were soft and 10.34% were hard on palpation, (Table 3). Most of the patients on presentation were euthyroid (88.96%) while 6.20% were hyperthyroid and 4.8% came to be hypothyroid, (Table 4). Before subjecting to treatment, all these patients were treated conservatively and thyroid function tests repeated till they all were euthyroid. Fine needle aspiration cytology

(FNAC) revealed benign solitary thyroid nodule in 88.27% of cases while 8.3% proved to be malignant and 3.45% were suspicious (Table 5). Out of this suspicious group, 2.1% proved to be benign and 1.4% were malignant on biopsy and histopathology.

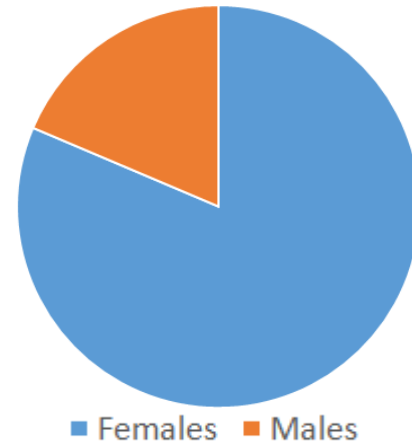


Fig. 1: Gender distribution of the patients

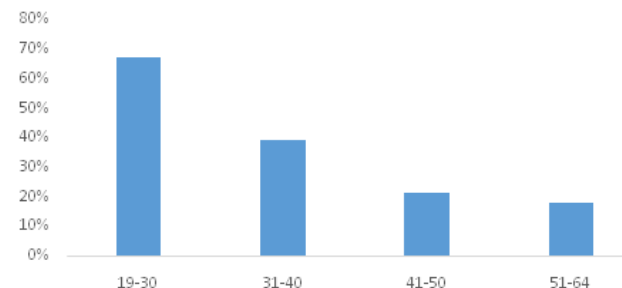


Fig. 2: Age distribution of the patients

Table 1: Site of solitary thyroid nodule in thyroid gland (n=145)

Site	No.	%
Right lobe	97	66.8
Left lobe	37	25.6
Isthmus	11	7.6

Table 2: Mode of presentation of patients who presented with a solitary thyroid nodule

Mode of presentation	No.	%
Swelling in front of neck	145	100.0
Sudden increase in size	25	17.24
Dysphagia	18	12.41
Change of voice	15	10.34
Dyspnoea	11	7.58
Pain	4	2.75

Ipsilateral Thyroid lobectomy having nodule done in all benign cases and total thyroidectomy in malignant

cases. In suspected cases, affected side lobectomy done and no further treatment in benign cases while in malignant cases, those patients subjected to total thyroidectomy again. All excised specimens were subjected to histopathology and it revealed non-neoplastic group consisting of 128 patients and mostly it was nodular goitre followed by hashimoto's thyroiditis and toxic nodular goitre. While in neoplastic group papillary neoplasm and follicular neoplasm were found, (Table 6).

Table 3: Clinical presentation of the solitary thyroid nodule on palpation

Presentation	No.	%
Firm	85	58.6
Soft	45	31.1
Hard	15	10.3

Table 4: Thyroid gland function tests on presentation

Mode of presentation	No.	%
Euthyroid	129	88.96
Hyperthyroidism	9	6.2
Hypothyroidism	7	4.8

Table 5: Fine needle aspiration cytological variations of solitary thyroid nodule

Diagnosis	No.	%
Benign STN	128	88.3
Malignant STN	12	8.3
Suspicious STN	5	3.4

Table 6: Histopathological variations of solitary thyroid nodules (n=145)

Non-neoplastic (n=128, 88.27%)	
Nodular Goiter	65%
Hashimoto's Thyroiditis	13.20%
Toxic Nodular Goiter	10.07%
Neoplastic (n=12, 8.3%)	
Papillary neoplasm	3.9%
Follicular neoplasm	4.4%
Suspicious (n=5, 3.45%)	
Benign	2.1%
Malignant	1.4%

DISCUSSION

The patients with diagnosis of "solitary thyroid nodule" were included. 118 were females and 27 were males with male to female ratio 1:4 and so it is evident that females have a predominance as compared to males that have solitary thyroid nodule but it does not necessarily indicate that females have predominance of malignancy as males are at a high risk group for malignancy if STN

is present. In another study STN were more common in females, where female to male ratio was 2.2:1.⁸ A female preponderance was seen for both non neoplastic and neoplastic conditions in study by Khadilkar et al.⁹ In another study by Fernando, et al¹⁰ reported that male to female ratio was 1:1.5. So in comparison to all these studies, our study is also synonymous to other studies with female predominance.

The age group of our study included patients from age 19 to 64 years, 19 years being the youngest patient from our group of patients and 64 years being the upper limit. In a study by Abdullah et al the highest frequency was between 21-30 years and the oldest patient being 75 years old and youngest 13 years old which tells that extremes of ages have low incidence of thyroid disease but higher chances of malignancy.¹¹ whereas in the study of Islam et al.2009 majority of patients were in the range of 21-40 years of age.

All solitary nodules are not a single entity. It is very difficult to assess regarding the nature of solitary nodule only on the basis of clinical ground. But hard irregular nodule, palpable cervical lymph nodes, hoarseness of voice, extremes ages and male patients are always suspicious for malignancy in solitary thyroid nodule.¹¹ Duration of symptoms ranged from 5 months to 3 years. In all cases the presenting feature was swelling in front of neck. Younger patients had only this complaint and sought advice for disfigurement. Pressure symptoms like dysphagia (12), dyspnea (8), and change of voice (4) were noted in 24 patients and sudden increase in size in 2 patients. Large swelling due to nodular goiter may be associated with respiratory distress or dysphagia due to pressure on trachea or oesophagus.¹²

In our study we found that majority of solitary nodules were present in right lobe of thyroid in 68% of patients and 25% were having it on left side while 07 % had nodule in isthmus. Although the role of location of the nodules has not yet been a reported predilection. Many authors also noted similar findings.^{13, 14}

Most of the nodule presentation was firm on palpation (85 patients). While 45 patients presented with soft consistency nodule and rest of 15 patients were having hard swelling. Most studies describe hard nodules turning into malignancy sometime later in life. In a study by Islam et al. 2009, found majority of the nodules were firm (72.03%), others were hard (16.95%), and cystic (11.02%). Malignancy was more common in hard nodule (70%). Hardness of nodule was due to malignancy and inflammatory conditions. Among six hard nodules, four were found to be malignant and two diagnosed as thyroiditis on histopathology. Concluding the evaluation from our

study and others, it doesn't specifically tell that hardness is an absolute indication for malignancy but is an important indication for malignancy to develop later in those patients. Irregularity and hardness due to calcification may simulate carcinoma.⁴ FNAC is minimally invasive but highly sensitive preoperative diagnostic tool.¹² Early and accurate diagnosis reduces surgical intervention, morbidity and mortality.¹⁵ FNAC revealed 128 cases as benign, 12 cases malignant and 5 cases were labelled as suspicious. Out of these suspicious cases 3 were benign and 2 proved to be malignant.

On Investigations, thyroid function test was done in all the patients. Number of patients who were euthyroid were 129 while patients with hyperthyroidism were 7 and were given anti thyroid drugs, 9 hypothyroid patients were given thyroxin.

Fine needle aspiration cytology was the most useful diagnostic tool and it helped in making the final diagnosis with revealing 88.27% benign cases, 8.3% malignant cases. 3.45 % were suspicious cases out of which 2.1 % proved to be benign while 1.4 % cases turned out to be malignant. Out of a total of 145 patients 65 patients had Nodular goiter, 3 were a case of hashimoto's thyroiditis, 2 had toxic nodule, and 23 patients with malignancy had papillary carcinoma and follicular neoplasm in about 52 patients.

In our study the percentage of malignant nodules was nearly 10%. Similarly in a study, 13.9% of patients of STN was found to be malignant.¹⁶ In our study female predominance was seen for malignancy in solitary thyroid nodule. Our study showed that 52% patients had follicular carcinoma diagnosed on FNAC while 27% were diagnosed as a case of papillary carcinoma. Unlikely a study by Islam et al. 2009, found in their study 18.65% of STN were malignant and out of them 16 (72.72%) were papillary carcinoma, 4(18.18%) follicular carcinoma and 2(9.1%) were medullary carcinoma. It shows predominant papillary carcinoma over follicular and medullary while our study has predominant follicular carcinoma.

Solitary thyroid nodule malignancy was present in 10% patients in our study of a small number of patients. Worldwide malignancy in STN ranging from 16 to 30 % was observed.¹⁷ Keeping in view this percentage, it's weightage to be considered as a matter of concern is high as even this low percentage is indicative of danger to human life. This small percentage may increase up to a percentage with drastic outcomes so it is better not to be neglected. Female ratio of malignancy is higher in our study but where males have STN, the rate of it turning to malignancy has been on higher side.

Follicular carcinoma has shown higher incidence in our study.

CONCLUSION

STN and its relation to malignancy is certainly a significant percentage of malignancy to be of importance. Early diagnosis and treatment will be the ultimate goal to reduce this amount to a percentage which is no longer significant and does not prove to be fatal.

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