

Correlation of Thyroid Scan with Cytological Findings of Thyroid Lump and its size

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ABSTRACT

Aim: To study the association of thyroid scan, thyroid function tests and size of thyroid nodule with the cytological diagnosis of the thyroid swellings.

Design: Descriptive cross-sectional study

Place and duration of study: Pathology department, King Edward Medical University (KEMU), Lahore from November 2018 - April 2019.

Methods: The patients presenting to the pathology department of KEMU for fine needle aspiration cytology (FNAC) of their thyroid nodule were selected and its results were correlated with the size of thyroid nodule, thyroid function tests (TFTS) and thyroid scan. Data was analyzed by SPSS 23. Chi Square test and cross tabulations were used to measure association between thyroid scan, FNAC and size.

Results: A total of 50 patients with thyroid nodules presenting at Pathology department were selected. The mean size of thyroid nodule was 3.64 ± 1.651 cm. It ranged from 2-10 cm. 29(58%) people had size between 3-5cm. 21 (42%) had size greater than 5 cm. On thyroid scan, many nodules 35(70%) were cold, 2(4%) nodules were warm, 1(2%) hot nodule and 12(24%) nodules were found to have MNG. Out of total 50 FNAC, 48(96%) were benign and 2(4%) were malignant.

Conclusion: We conclude that among all nodules, cold nodules are mostly malignant and FNAC should only be done for cold nodules. Size of thyroid nodule has no association with malignancy of nodule.

Keywords: Thyroid scan, Thyroid lump, FNAC, Cold nodule, Malignant

INTRODUCTION

Diseases of thyroid gland are common and mostly seen in women¹. Thyroid nodules are more common in adult population². Thyroid cancer is seen in 7%-15% of the population. So it is necessary to differentiate it from benign thyroid nodules. For management of thyroid swellings different types of investigations are present in addition to relevant history and examination to reach the final diagnosis. This research focuses on the size of thyroid nodule, thyroid function tests, thyroid scan and fine needle aspiration cytology. We can check the function of thyroid gland by measuring the hormones secreted by it as the result may be hyperthyroid, euthyroid or hypothyroid. Thyroid scans are also useful as they tell us about the hot, warm and cold nodule³.

For accurately managing thyroid lump, benign and malignant nodules should be differentiated. We cannot differentiate them on the basis of TFTs. Rather; fine needle aspiration cytology is used as a gold standard test to reach final diagnosis⁴.

There are a lot of controversies in the relationship between the size of thyroid nodule and malignancy. Several researches are in favor that size of the nodule is helpful in evaluation of the risk of malignancy^{5, 6}. While other studies reported that the increase in nodular size was not associated with the increase in cancer risk⁷⁻¹⁰.

With the help of this research we want to see that it is not necessary for all thyroid swellings to undergo FNAC as majority of them are benign. Hot nodules are mostly benign, but a few cold nodules are found to be malignant¹¹.

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Thyroid scan cannot comment on the malignancy of the nodules¹². Thyroid nodules with symptoms of compression like airway compression, dysphagia, distended neck veins etc.) or those with high risk for carcinoma needs prompt evaluation for surgical management¹³. So it is justifiable to do FNAC of only the cold nodules to reach the final diagnosis as FNAC is time taking and a risky procedure. This can save a lot of time and is cost effective and can reduce the burden on Pathology department.

METHODOLOGY

Descriptive cross-sectional study conducted at Department of Pathology, King Edward Medical University, Lahore from November 2018- April 2019. Ethical clearance was obtained from Institutional Review Board of King Edward Medical University, A total of 50 patients were included with the help of consecutive purposive sampling. All males and females with age between 15 and 90 coming to Pathology Department for thyroid FNAC having thyroid scan and thyroid function tests (TFTs) reports with them were included in this study. Patients who did not give consent and those with diagnosed cases of thyroid cancer and those who did not have thyroid scan, TFTs reports with them were not included. Data collection was done using a proforma containing questions on demography, presenting complaints, size of thyroid nodule, results of TFTs, thyroid scan and FNAC. SPSS 23 was used for the analysis of data. Quantitative variables like age and size of thyroid nodule were presented as mean \pm SD. Qualitative variables like gender, presenting complaint, results of thyroid scan, TFTs and FNAC were presented as frequency and percentages.

RESULTS

Fifty patients consented to participate. The age of participants ranged from 18-63. The mean age was 37.20 ± 11.8 . Among them there were more females 43 (86%) than males 7 (14%). 3.64 ± 1.651 cm was the mean size of the nodule. It ranged from 2-10cm. 29/50 (58%) people had size between 3-5 cm. 21/50 (42%) had size greater than 5 cm. Regarding TSH, 44 (88%) people had normal TSH, 4 (8%) had low TSH and 2 (4%) had raised TSH. Regarding T3 44 (88%) people had normal T3, 4 (8%) had raised T3 and 2 (4%) had low T3. On thyroid scan, many nodules 35 (70%) were cold of which 34 (97.1%) were benign and 1 (2.9%) was malignant. 2 (4%) nodules were warm of which 1 (50%) was benign and 1 (50%) was malignant. There was 1(2%) hot nodule which was benign. 12(24%) nodules were found to have Multinodular Goiter (MNG) all of which were benign. Out of total 50 FNAC, 48(96%) were benign and 2(4%) were malignant. The relation of results of scan and size with results of FNAC is described with the help of following tables:

Table 1: Scan and FNAC cross tabulation

Scan	FNAC		Total
	Benign	Malignant	
Cold			
Count	34	1	35
% within SCAN	97.1%	2.9%	100.0%
Warm			
Count	1	1	2
% within SCAN	50.0%	50.0%	100.0%
Hot			
Count	1	0	1
% within SCAN	100.0%	0.0%	100.0%
MNG			
Count	12	0	12
% within SCAN	100.0%	0.0%	100.0%
Total			
Count	48	2	50
% within SCAN	96.0%	4.0%	100.0%

Table 2: Size and FNAC cross tabulation

Scan	FNAC		Total
	Benign	Malignant	
Equal or less than 5 cm			
Count	28	1	29
% within SIZE	96.6%	3.4%	100.0%
Greater than 5 cm			
Count	20	1	21
% within SIZE	95.2%	4.8%	100.0%
Total			
Count	48	2	50
% within SIZE	96.0%	4.0%	100.0%

DISCUSSION

Thyroid nodules are lumps within thyroid gland due to abnormal growth of cells. The thyroid nodule incidence is increasing with time. The thyroid nodules may be asymptomatic or they may present with any of the complaints like swelling in front of the neck, dyspnea, dysphagia, dysphonia, discomfort or features of hypothyroidism or hyperthyroidism.

Our study included 50 patients coming to Pathology Department of King Edward Medical University. Most of them were elderly with the mean age of 37.2 ± 11.8 . It is also seen in a lot of previous researches that thyroid nodules incidence is more common in elderly people^(14, 15). In this research, females were more in number than males. It is commonly observed that females are more at risk of developing thyroid nodules^{16, 17}.

It is evident from this study that size of the nodule has no significant effect on malignancy as most of the nodules were found to be benign. There are a lot of controversies about the relationship of size and malignancy. Several studies have reported that the increase in nodular size is not associated with the increase in cancer risk⁽⁷⁻¹⁰⁾ while other researches have reported that nodule size > 3 or 4 cm are more prone to be malignant^(5,6) probably their sample size is larger and this study needs to be validated by large sample size.

Regarding Thyroid Functioning Tests in this study, most of the patients were euthyroid followed by hyperthyroid and then hypothyroid. Of the total 50 patients only 1 euthyroid and 1 hypothyroid patient were found to have malignant nodule. According to Popoveniuc et al. serum TSH and chances of thyroid nodule to be cancerous are directly proportional to each other¹⁸.

Thyroid scan is important in investigating thyroid nodule to see the possibility of an autonomously functioning nodule. Our results documented that there were more cold nodules than any other type of nodule. It is seen in the research of Basharat et al. that cold nodules are more in frequency than hot nodules on thyroid scan¹. According to Bomeli et al. the chances of malignancy in cold nodules are greater than that of hot nodules¹⁹. Hot nodules are hyper functioning and are mostly benign and generally do not require further investigation^(20, 21) while a cold nodule may indicate malignant potential.

In order to differentiate benign and malignant nodules we need to do Fine Needle Aspiration Cytology (FNAC). It is evident from our research that most of the nodules on FNAC were found to be benign. Wettasinghe et al. reported that benign nodules are more common than malignant nodules⁽²²⁾. Pal et al. concluded in their research that FNAC is a common done procedure as it is accurate, relatively simple, inexpensive, less time consuming, virtually painless and highly patient compliant²³. But as the aim of our research is to create awareness among doctors to prescribe FNAC for cold nodules which will help in proper guidance of patient management. It will avoid long waiting list of FNAC patients at Pathology Department. Patients become apprehended and anxious if they have to wait for a simple test for many months. In addition, it will save a lot of time and will reduce burden on Pathology Department.

CONCLUSION

We conclude that cold nodules are mostly benign and FNAC should only be done for cold nodules. Size of thyroid nodule is a weak indicator of malignancy of nodule.

Conflict of interest: There was no conflict of interest.

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