



CYTOMORPHOLOGICAL STUDY OF THYROID LESIONS BASED ON BETHESDA SYSTEM.

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Conflicts of Interest: Nil

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Abstract:

Introduction: Thyroid gland with its superficial location allows the evaluation of various lesions by FNAC. The reporting system used for thyroid cytology is uniform & standardised Bethesda system.

Materials & methods:-A retrospective study was conducted in pathology department of Patliputra Medical College, Dhanbad, Jharkhand from November, 2017 to October, 2019 on patients meeting the mentioned inclusion & exclusion criteria. The air dried stained smears of materials obtained by FNAC were reported according to Bethesda system.

Result: Out of 116 cases studied, 4(3.44%) were unsatisfactory for reporting, 87(75%) were benign follicular lesions, 4(3.44%) were atypia of undetermined significance, 7(6.03%) were follicular neoplasm or suspicious for follicular neoplasm, 5(4.31%) were suspicious for malignancy & 9(7.75%) were malignant.

Conclusion: Bethesda system for reporting of thyroid FNAC has an effective guide for management of thyroid lesions.

Keywords: Thyroid lesions, Bethesda system, Atypia, Follicular neoplasm.

Introduction

Thyroid gland is the largest endocrine gland found superficially in front of neck. The gland has vast array of disorders which are not uncommon in clinical practice. FNAC is widely accepted screening & diagnostic tool for thyroid lesions associated with a high sensitivity & specificity. It is simple, cost effective & minimally invasive which can diagnose most of the lesions of thyroid. As well it is used in differentiation of thyroid lesions which require surgical excision from those managed medically & require no further interventions.

There are many proposed diagnostic guidelines for reporting of thyroid FNAC but none have been necessarily universally accepted. However the Bethesda system has been considered as an uniform & standardised thyroid reporting system which improves the communication & collaboration between pathologists & clinicians/surgeons.

Aims & objectives

To evaluate various cytomorphological features of thyroid lesions in different age groups & sexes.

Materials & methods

All the cases of thyroid lesions were received in cytology section of pathology department, Patliputra Medical College, Dhanbad, Jharkhand for FNAC of thyroid swelling. There were total 116 cases during the period of two years from November, 2017 to October, 2019 for retrospective study.

Clinical history & physical findings were noted & then FNAC was performed by conventional method of palpation

using a 23/24 gauze needle attached to a 20 ml disposable syringe mounted on a syringe holder under aseptic & antiseptic measures. Materials were poured on glass slides & smears were prepared. Then air dried smears were stained with Giemsa stain &/or haematoxylin-eosin stain. The smears so produced were examined under optical compound microscope & reporting was done according to Bethesda system.

Inclusion criteria

Clinically palpable thyroid lesions in both sexes of all age groups.

Exclusion criteria

Non-consenting/non-co operative patients.

Result

There were total 116 cases in present study spanned from 13 years to 65 years old. They were arranged into different age group as shown in Table-1. The maximum number of cases were found in age group of 30-44 years (45/38.79%) followed by 15-29 years (39/33.62%) while the least number of cases were found in less than 15 years of age group (3/2.58%) followed by more than 59 years of age group (5/4.31%).

Table 1: Distribution of patients according to age

Age (in years)	No. Of patients	Percentage
<15	03	02.58
15 – 29	39	33.62
30 – 44	45	38.79
45 – 59	24	20.68
>59	05	04.31
Total	116	99.98

Cases were also arranged into sex-wise distribution (Figure-1). The female cases were found 103(88.79%) while male cases were only 13(11.20%). The male-female ratio was 1:7.92.

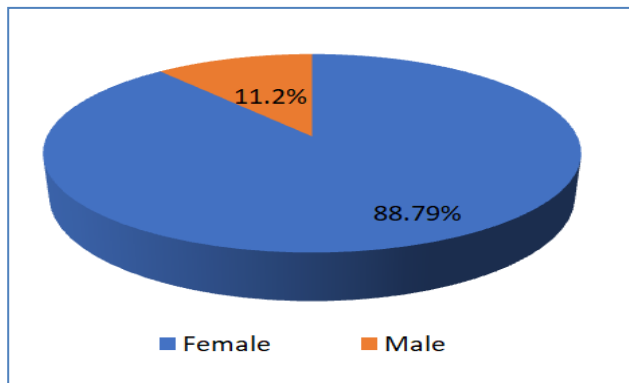


Figure 1: Pie diagram showing sex distribution

According to cytological diagnosis based on Bethesda system as shown in Table-3, the maximum cases were benign follicular lesions(87/75%) followed by malignant tumour(9/7.75%). The number of cases in other thyroid lesions was 4(3.44%) in atypia of undermined significance, 7(6.03%) in follicular neoplasm or suspicious for follicular neoplasm & 5(4.31%) in suspicious for malignancy.

Table 2: Cytomorphological diagnosis based on Bethesda system

Cytomorphological diagnosis	No. of patients	Percentage
Unsatisfactory or non diagnostic	04	03.44
Benign follicular lesion	87	75.00
Atypia of undetermined significance	04	03.44
Follicular neoplasm or suspicious for follicular neoplasm	07	06.03
Suspicious for malignancy	05	04.31
Malignant tumor	09	07.75
Total	116	99.97

Discussion

In present study the majority of cases were found in 15-44 years of age(84/72.41%) comparable to study by Chetan V R et al who found 78% cases in 15-49 years of age while Sengupta et al found 75% cases in 21-40 years of age.

We know that females have more thyroid diseases than males. In present study too females were more sufferer with male-female ratio being 1:7.92. Likhar K S et al & Bamanikar S et al showed male- female ratio 1:7 & 1:8.6 respectively. Nearly all patients in our study presented with swelling in front of neck which was similar to study by Handa U et al & others.

Unsatisfactory smears were 4(3.44%) in present study which were due to obscuring blood & or inadequate follicular cells. Other considered causes are overly thick smears & air drying of alcohol fixed smears. Satisfactory smears require at least six groups of benign follicular cells,

each group composed of at least ten cells. However there are exceptions like abundant colloid, any atypia or lymphocytic thyroiditis. Nayar R et al found 5% unsatisfactory smears while Bukhari MH et al & M Mamatha found 10.8 % each.

Benign follicular lesions were 87(75%) with colloid goitre being the predominant thyroid lesion. Yassa et al & Yang et al showed in their study 66% & 64.6% respectively. Minority of thyroid lesions don't get easily classified into benign, suspicious or malignant categories which are reported in Bethesda system as atypia of undetermined significance. These cases of atypia were 4(3.44%) which was similar to study by Yang et al & study by Bukhari MH et al who showed 3.2% & 3.4% respectively. However follicular neoplasms or suspicious for follicular neoplasm had wide variations in different studies.

Suspicious for malignancy, in present study, were 5(4.31%) comparable to study by Mamatha M(4.2%) & study by Yassa et al(5%). Yang et al found 7.6% malignant tumour which was similar to present study(9/7.75%).

Conclusion

Thyroid FNAC has a great advantage in making a reliable benign interpretation that avoids unnecessary surgery in patients. The different categories in Bethesda system for reporting thyroid cytopathology are well defined & morphologically distinct. This facilitates effective communication among various specialists in medical science. However cytomorphological diagnosis of various thyroid lesions should be assessed in conjunction with clinical findings & investigations like thyroid function test, ultrasonography & others.

References

1. Cibas ES, Ali SZ. The Bethesda System for Reporting Thyroid Cytopathology. *Am J Clin Pathol*. 2009;132:658-65
2. Sengupta A, Pal R, Kar S, Zaman FA, Sengupta S, Pal S. Fine needle aspiration cytology as the primary diagnostic tool in thyroid enlargement. *J of natural science, biology & medicine*. 2011 jan;2(1):113-8.
3. Likhar KS, Hazari RA. Diagnostic accuracy of fine needle aspiration cytology in thyroid lesions. A hospital based study. *Thyroid Research & Practice*. 2013 May-August;10(2):68-71.
4. Bamanikar S, Soraisham P, Jadhav S, Kumar S, Jadhav P, Bamanikar A. Cyto-histology & clinical correlation of thyroid gland lesions. A 3 year study in a tertiary hospital. *Clin Cancer Investig J*. 2014;3:208-12
5. Pandit AA & Kinare SG. Fine needle aspiration cytology of thyroid. *Indian J Cancer*. 1986;23(1):54-8
6. Handa U, Sukant G, Mohan H, Nagarkar N. Role of fine needle aspiration cytology in diagnosis & management of thyroid lesions. A study on 434 patients. *J Cytol*. 2008;25(1):13-7
7. Nayar R, Ivanovic M. The Indeterminate Thyroid Fine Needle Aspiration. *Cancer Cytopathol*. 2009;3:195-202
8. Bukhari MH, Khan AA, Niazi S, Arshad M, Akhtar ZM, et al. Better Thyroid Cytopathology Reporting System May Increase the Clinical Management & Patients Outcome. *J Cytol Histol*. 2012;3(6):1-6
9. Safirullah, Mumtaz N, Akbar K. The role of fine aspiration cytology in the diagnosis of thyroid swellings. *JPMI*. 2004; 18(2):196-201
10. M Mamatha, S Chandra Sekhar, H Sandhya Rani, S Sandhya Anil, G

Vandana,.A comparative study between conventional system & the Bethesda system applied for reporting thyroid cythopathology.IAIM.2015;2(3):87-95

11. Dhanadia A,Shah H,Dave A.Ultrasonographic & FNAC correlation of thyroid lesions.Gujrat Medical Journal.2014 Mar;69(1):75-81.
12. Yang J,Schnadig V,Logrono R,Wassermann PG.Fine needle aspiration of thyroid nodules:A study of 4073 patients with histologic & clinical correlations.Cancer.2007;5:306-15.
13. Chandanwale S,Singh N et al.Clinicopathological correlation of thyroid nodules.Int J Pharm Biomed Sci.2012;3(3):97-102.
14. Yassa L,Cibas ES,Benson CB,Frates MC,Doubilet PM,Gawande AA et al.Long-term assessment of a multidisiplinary approach to thyroid nodule diagnostic evaluation.Cancer Cytopathol.2007;111(6):508-16.