



THE BETHESDA SYSTEM FOR REPORTING THYROID CYTOPATHOLOGY : A ONE YEAR PROSPECTIVE STUDY IN A TERTIARY CARE HOSPITAL (ASSAM MEDICAL COLLEGE AND HOSPITAL, DIBRUGARH)

Pathology

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ABSTRACT

Background: To report thyroid FNA specimens, the Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) developed a standardized, tiered system. For thyroid FNA, cytopathologists are now permitted to adopt a standardized, category-based reporting system according to TBSRTC. The six diagnostic categories in the Bethesda System are associated with evidence-based clinical care guidelines and each category has an inferred cancer risk. **Aims:** This study's objective was to evaluate the thyroid cytology smears performed by the "TBSRTC" at our institution, Assam Medical College and Hospital, as well as to determine the frequency of different categories and link them with earlier published research. **Methods:** A prospective observational research of 155 thyroid FNA samples was carried out in the pathology department of Assam Medical College and Hospital in Dibrugarh over the course of a year, from January 2023 to December 2023 . A total of 155 thyroid FNA smears (papanicolaou and MGG) were analyzed and classified based on TBSRTC for cytomorphological analysis. **Results:** From 155 thyroid FNA samples that were analyzed, the distribution of different groups was as follows: I) Nondiagnostic 11.6% II) Benign 70.32 % III) Atypia of Undetermined Significance (AUS) 5.8% IV) Follicular neoplasm (FN) 6.4%, v) Suspicious for malignancy (SM) 3.8 %, and VI) Malignant 1.9 **Conclusion:** Another great thyroid FNA reporting method is TBSRTC. Additionally, it gives providers uniform care guidelines for follow-up FNAs or surgeries. Out of the 155 thyroid FNA samples that were assessed for our study, Category II was the most prevalent lesion, accounting for roughly 70.32 percent of all cases, followed by Category I (11.6 percent).

KEYWORDS

Thyroid, Fine needle aspiration cytology, Bethesda system, Follicular Neoplasm, Papillary Thyroid carcinoma

INTRODUCTION

One prevalent clinical issue is thyroid nodules. It's critical to distinguish between benign and malignant nodules. Thyroid FNA cytology has been established as the primary diagnostic technique for assessing thyroid lesions prior to surgery(1). It has been demonstrated that FNA is the most straightforward, economical, safest, and accurate diagnostic method. It can also classify a variety of benign and malignant tumors, which helps to shape treatment plans (1). The National Cancer Institute (NCI) held the NCI Thyroid Fine Needle Aspiration State of the Science Conference in Bethesda, Maryland, in 2007 with the goal of standardizing diagnostic terminology, morphologic criteria, and risk of malignancy for reporting thyroid FNA. The NCI proposed a six-tier system, which they called "The Bethesda System For Reporting Thyroid Cytopathology" (TBSRTC)(2) . First published in 2010, the TBSRTC comprises six diagnostic categories with clearly stated diagnostic criteria, sample explanatory notes, and—most importantly—clinically implied risk of malignancy (ROM) for each category and management guidelines 3). In June 2023, the Bethesda system's third edition was released. The primary goals of the third edition are to update the ROM for each diagnostic category, adopt new histologic terminologies in accordance with the 2022 WHO Classification on Thyroid Neoplasms, and simplify diagnostic categories by using single names for each category (3).

The Six Bethesda Diagnostic Categories Are:-

- (Category I) Non diagnostic
- (Category II) Benign
- (Category III)Atypia of Undetermined Significance
- (Category IV) Follicular Neoplasm
- (category V) Suspicious for Malignancy
- (Category VI) Malignant

Aim: The aim of this study was to evaluate the thyroid cytology smears using the Bethesda system, determine the frequency of different categories, and link it with earlier published studies.

METHODS:

The study, which lasted one year from January 2023 to December 2023, was carried out as a prospective observational study of 155 thyroid FNA samples in the pathology department of Assam Medical College and Hospital, Dibrugah. All thyroid FNA smears (MGG and papanicolaou) were analyzed and grouped based on TBSRTC for cytomorphological analysis. Additional clinical data, including FNAC, ultrasound, labotary tests, and surgical results, as well as pertinent clinical data, including age, gender, and clinical presentation, were gathered and connected appropriately .

Inclusion Criteria:

The study included all patients aged 3 to 80 who had palpable thyroid swellings, USG-guided samples, and no indications of acute inflammation.

Exclusion Criteria:

- Any further neck swellings besides thyroid.
- SPSS software, version 23, was used to statistically analyze the collected data.

RESULTS:

A total of 155 cases were reported according to the Bethesda system of reporting. [Table 2] , Category II the most common lesion amounting to about (70.32%) of total cases followed by category I (11.6%) , category IV (6.4%), category III (5.8%), category V (3.8%) and category VI (1.9%).

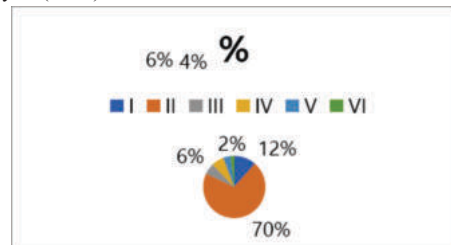


Fig 1: Pie chart

Table 1: Age Wise Distribution Of Cases

Age (Years)	Female	Male	Total	Percentage
20 ≥	7	3	10	6.45
33 30 -21	3	3	36	23.22
40-31	40	3	43	27.74
50-41	27	3	30	19.35
60-51	16	6	22	14.19
70-61	12	1	13	8.38
80-71	1	0	1	0.64
Total	136	19	155	100

Table 2: Distribution Of Cases As Per TBSRTC

Sl no	Cytological Category	Subcategory	Number of cases	Total number of cases Each(%)

1	Non-diagnostic	Cystic fluid only Acellular specimen Other (obscuring blood)	10 4 4	18 (11.6%)
2	Benign	Benign follicular nodule (include colloid nodule, adenomatoid nodule etc.) Lymphocytic (Hasimoto) Thyroiditis Granulomatous Thyroiditis Other	81 18 7 3	109 (70.32%)
3	AUS		9	9 (5.8%)
4	Follicular Neoplasm		10	10 (6.4%)
5	Suspicious for Malignancy	Suspicious for Papillary thyroid Carcinoma Suspicious for Medullary thyroid Carcinoma Suspicious for metastatic Carcinoma	3 2 1	6 (3.8%)
6	Malignant	Papillary thyroid Carcinoma Medullary thyroid carcinoma Anaplastic Carcinoma	1 1 1	3 (1.9%)
		Total number of cases	155	

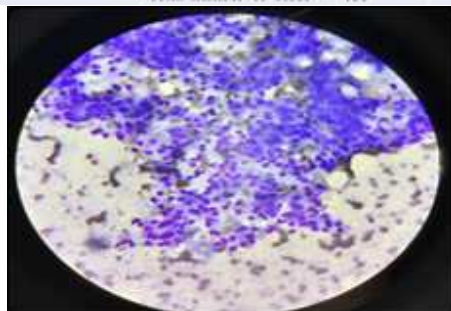


Figure 2: MGG Stain, 40X, Highly cellular smear mostly oncocytic cells, Category IV

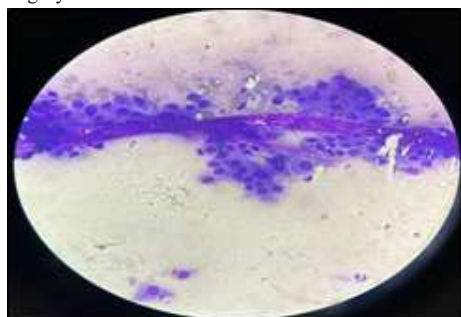


Figure 3: MGG Stain, 40X, Papillary Thyroid Carcinoma, Category VI

A female preponderance was noted in our study with 136 cases (87.74%) and female to male ratio is 7.1:1. The most common age group affected by thyroid lesion was the age group of 31-40 years followed by 21-30 years, [Table 1]. The distribution age of ranged from 3 years to 75 years with a mean age of 41.32 years. [Table 3], Category II lesions included predominantly benign follicular nodule (include benign nodule, adenomatoid nodule) and lymphocytic (hasimoto) thyroiditis being the second common as observed while reporting. Granulomatous thyroiditis was the third common lesion. Category I

included cystic lesion, hemorrhagic smears, inadequate samples. Category III included lesions with low cellularity or occasional microfollicles. Category IV included follicular neoplasms with oncocytic changes and adequate cellularity. Category V and VI mainly included papillary thyroid carcinoma, medullary thyroid carcinoma and anaplastic thyroid carcinoma respectively.

Table 3: Comparison Along With Other Studies

Diagnostic Criteria	Present Study	Jo et al (6)	Thewjitcharoen Y et al (7)	Yassa et al (9)	Mondal et al (8)
Non-Diagnostic	11.2	18.6	21.1	7	1.2
Benign	70.32	59.0	66.6	66	87.5
AUS	5.8	3.4	4.7	4	3.4
Follicular Neoplasm	6.4	9.7	2.4	9	9.7
Suspicious for Malignancy	3.8	2.3	1.8	9	2.3
Malignant	1.9	7.0	3.3	5	7.0

DISCUSSION:

Around 136 cases (87.74%) were females in our study. Similar female preponderance was noted by Unnikrishnan et al (5) and other previous study. This data was corroboratory to the results of the study conducted by Jo et al (6), conducted study of 3,080 thyroid FNA samples according to TBSRTC, but the percentage of category V lesion higher in our study. [Table 3], Comparison with other studies, in our study was different from studies described earlier, lower percentage of cases falling into benign category than Mondal et al (8), but higher than Jo et al (6), Thewjitcharoen et al (7) and Yassa et al (9). Higher percentage falling into Non-diagnostic category compared to Mondal et al (8), Yassa et al (9). Category II is the most common lesion in our study followed by Category I similar to studies conducted by Jo et al (6), Thewjitcharoen et al (7).

Limitation Of Study : For our instances, there were no available IHC or histopathological correlation data. Therefore, Cyto-Histological Correlation has not done.

Financial Support : Nil
Conflict Of Interest : None

CONCLUSIONS:

An outstanding thyroid FNA reporting system is TBSRTC. Additionally, it offers providers standardized care guidelines for follow-up FNAs or surgeries, together with information on the extent of surgery. After evaluating 155 thyroid FNA samples, we discovered that category II is the most common lesion, accounting for roughly 23.07 percent of all cases. Category I comes in second at 11.6%, which is consistent with the findings of earlier research by Thewjitcharoen Y et al (7) and Jo et al (6).

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