

## Study of Cytology of Thyroid Lesions in Uttar Pradesh Population

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### Abstract

**Background:** The role of cytology has two folds, therapeutic and diagnostic. Thyroid swellings referred to the FNAC test include diffuse, firm, palpable solitary nodules and nodules associated with suspicious clinical or ultrasonographic features.

**Method:** 140 (one hundred and forty) adult patients aged between 20 to 50 years who were having thyroid swellings were studied by the FNAC technique and classified with cytological examination based on the Bethesda classification of 6 groups.

**Results:** 9 (6.4%) were ND/USA, 110 (78.5%) were benign, 5 (3.5%) were FN/SFN, 2 (1.4%) were SFM, and 9 (6.4%) were malignant.

**Conclusion:** The present study will be helpful to oncological surgeons to treat such patients efficiently to prevent morbidity and mortality.

**Keywords:** SFM, FN/SFN, AUS/FLUS, Benign, ND/UNS, FNAC.

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### Introduction

The majority of thyroid swellings are benign, and the incidence varies from 4% to 5% in the general population. Among benign goiter is most common. The prevalence of goiter is more than 40 million in India, with more than 2 billion globally [1]. Thyroid swelling is observed in females in majority than males. It is mainly due to iodine deficiency. The incidence of thyroid cancer in nodules varies from 1% to 20%.

FNAC (fine needle aspiration cytology) technique is now well established [2]. It is a first-line diagnostic test for the evaluation of diffuse thyroid lesions and thyroid nodules with the main purpose of confirming benign from malignant lesions, thereby avoiding unnecessary surgical approaches [3]. Thyroid cytology can provide a definite diagnosis of malignancy with tumor type, enabling appropriate therapeutic surgery in one stage. It can triage the remaining patients into those who potentially require surgical as opposed to medical endocrinological management. The role of thyroid cytology is twofold: therapeutic and diagnostic [4]. Hence, an attempt is made to evaluate the types of cytology of the thyroid in adult patients.

### Material and Method

140 (one hundred forty) adult patients aged between 20 to 50 years who visited Krishna Mohan Medical College and Hospital, Pali Dungra, Sonkh Road, Mathura, Uttar Pradesh-281123, were studied.

**Inclusive Criteria:** The patients having thyroid swelling who gave their consent for the study in writing for cytological studies were selected.

**Exclusion Criteria:** The patients had inadequate aspiration on FNAC. Patients who had previously undergone thyroid surgery and immunocompromised patients were excluded from the study.

### Method

A detailed history of every patient was noted, clinical examination and radiological investigation were performed, and FNA (fine needle aspiration) was performed from different sites of the thyroid lump using a 10 ml disposable syringe and 23/24-gauge needle without local anesthesia. FNA air-dried smears were stained with Giemsa stain.

Cytological examination based on Bethesda classification.

After careful and thorough examination of the MGG-stained aspirate smears, FNAC results were classified into six (6) groups: (1) Non-diagnostic/unsatisfactory (2) Benign (consisting of goiter and thyroiditis) (3) Atypia of undetermined significance (AUS) / Follicular lesion of undetermined significance (FLUS) (4) Follicular Neoplasm (FM) / Suspicious for Follicular Neoplasm (SFN) (5) Suspicious for malignancy (SFM) (6) Malignant.

The duration of the study was November 2024 to August 2025.

Statistical analysis: Different lesions in different categories were classified with percentages. The statistical analysis was carried out in SPSS software. The ratio of the male and the female was 1:2.

### Observation and Results

**Table 1:** Classification of thyroid lesions – 9 (6.4%) (ND/UNS) non-diagnostic or unsatisfactory, 110 (78.5%) benign, 5 (5.5%) AUS/FLUS (Atypia of undetermined significance), 5 (3.5%) were FN/SFN (suspicious for follicular neoplasm), 2 (1.4%) was SFM (suspicious for malignancy), 9 (6.4%) were malignant.

**Table 2:** Classification of subcategories in Bethesda system for reporting thyroid cytopathology ND/UNS – 5 cyst. Fluid only, 2–virtually a cellular specimen, 2–obscuring blood, Total number cases are 9

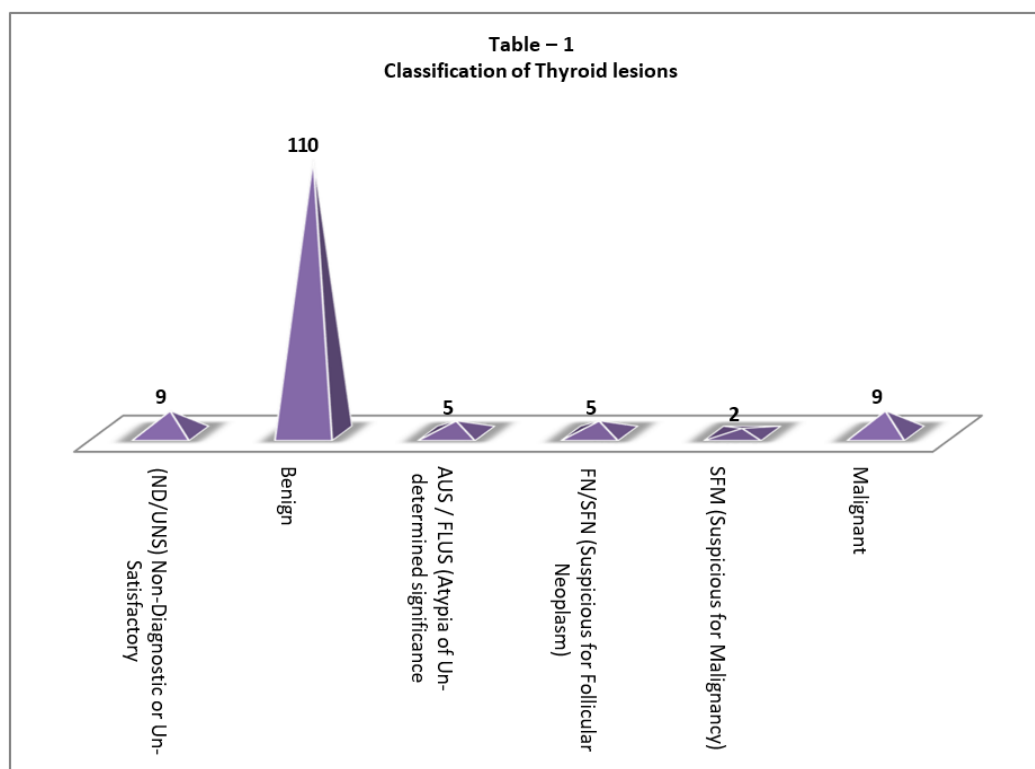
**Benign:** 72 benign follicular nodule, 30 lymphocytic thyroiditis, 9–granulomatous thyroiditis, Total number of cases are 111.

2 cases of AUS/FLUS, 2 cases of SFN, 11 malignant cases, 9 papillary thyroid, 2 carcinoma medullary thyroid

Table 3: Present study findings are compared with previous workers.

**Table 1: Classification of Thyroid lesions (Total No: 140)**

| Sl. No | Cytological Categories                            | Frequency | Percentage (%) |
|--------|---------------------------------------------------|-----------|----------------|
| 1      | (ND/UNS) Non-Diagnostic or Un-Satisfactory        | 9         | 6.4 %          |
| 2      | Benign                                            | 110       | 78.5 %         |
| 3      | AUS / FLUS (Atypia of Un-determined significance) | 5         | 3.5 %          |
| 4      | FN/SFN (Suspicious for Follicular Neoplasm)       | 5         | 3.5 %          |
| 5      | SFM (Suspicious for Malignancy)                   | 2         | 1.4 %          |
| 6      | Malignant                                         | 9         | 6.4 %          |

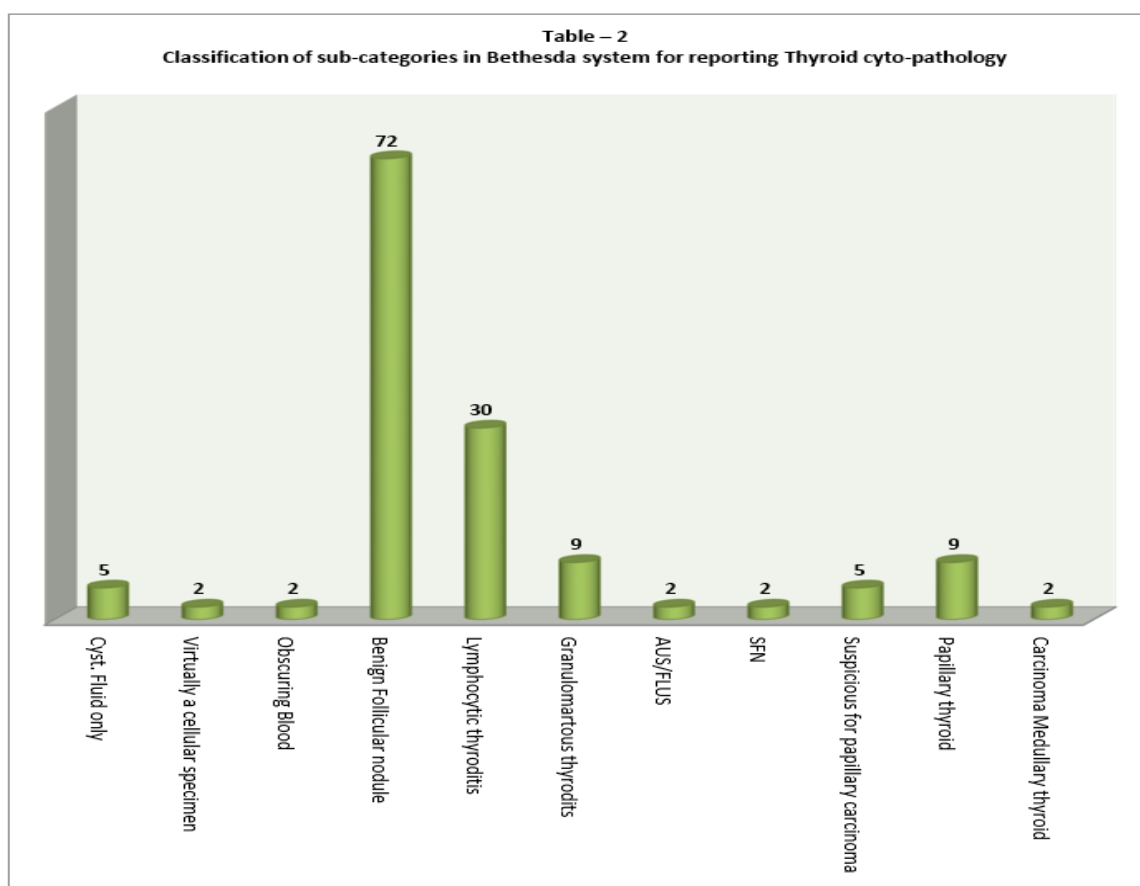


**Figure 1: Classification of Thyroid lesions**

**Table 2: Classification of sub-categories in Bethesda system for reporting Thyroid cyto-pathology (Total No: 140)**

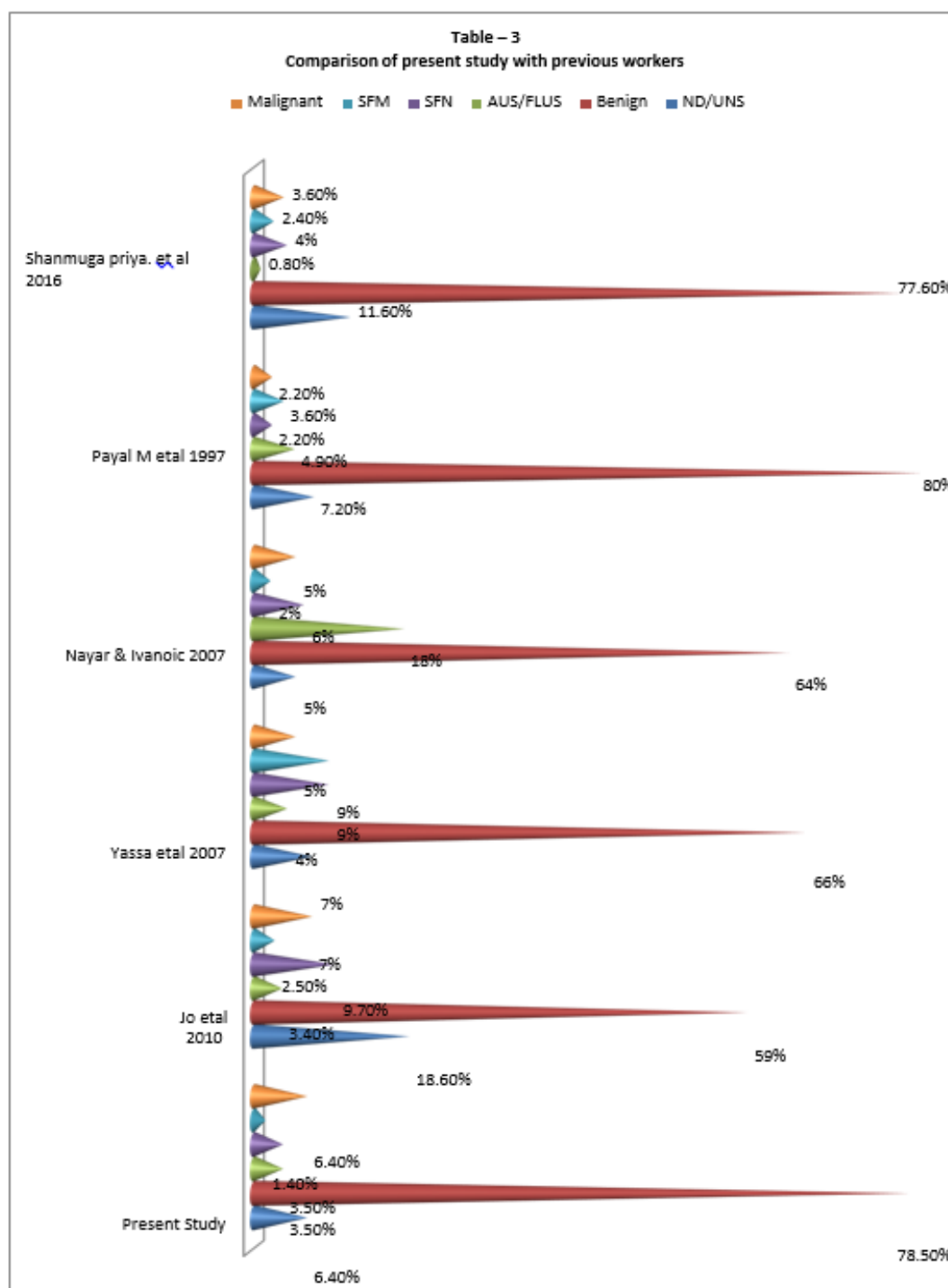
| Sl. No | Cytological categories | Sub categories                     | No. of cases | Total No. of cases |
|--------|------------------------|------------------------------------|--------------|--------------------|
| 1      | ND/UNS                 | Cyst. Fluid only                   | 5            | 9                  |
|        |                        | Virtually a cellular specimen      | 2            |                    |
|        |                        | Obscuring Blood                    | 2            |                    |
| 2      | Benign                 | Benign Follicular nodule           | 72           | 111                |
|        |                        | Lymphocytic thyroiditis            | 30           |                    |
|        |                        | Granulomatous thyroiditis          | 9            |                    |
| 3      | AUS/FLUS               | --                                 | 2            | 2                  |
| 4      | SFN                    | --                                 | 2            | 2                  |
| 5      | SFM                    | Suspicious for papillary carcinoma | 5            | 5                  |
| 6      | Malignant              | Papillary thyroid                  | 9            | 11                 |
|        |                        | Carcinoma Medullary thyroid        | 2            |                    |

The majority of benign cases are 111 and least number of SFM is observed.

**Figure 2: Classification of sub-categories in Bethesda system for reporting Thyroid cyto-pathology****Table 3: Comparison of present study with previous workers**

| Diagnostic particulars | Present Study | Jo et al 2010 | Yassa et al 2007 | Nayar & Ivanoic 2007 | Payal M et al 1997 | Shanmuga priya. et al 2016 |
|------------------------|---------------|---------------|------------------|----------------------|--------------------|----------------------------|
| ND/UNS                 | 6.4%          | 18.6%         | 7%               | 5%                   | 7.2%               | 11.6%                      |
| Benign                 | 78.5%         | 59%           | 66%              | 64%                  | 80%                | 77.6%                      |
| AUS/FLUS               | 3.5%          | 3.4%          | 4%               | 18%                  | 4.9%               | 0.8%                       |
| SFN                    | 3.5%          | 9.7%          | 9%               | 6%                   | 2.2%               | 4%                         |
| SFM                    | 1.4%          | 2.5%          | 9%               | 2%                   | 3.6%               | 2.4%                       |
| Malignant              | 6.4%          | 7%            | 5%               | 5%                   | 2.2%               | 3.6%                       |

Present study findings are more or less in agreement with previous studies.



**Figure 3: Comparison of present study with previous workers**

### Discussion

The present study of cytology of thyroid lesions in the Uttar Pradesh population. In the classification of 110 (78.5%) benign, 5 (3.5%) AUS/FLUS, 5 (3.5%) FN/SFN, 2 (1.4%) SFM, and 9 (6.4%) malignancy (Table 1). The classification of sub-categories in the Bethesda system for reporting cytopathology of the thyroid was that out of 9, 5 were cyst fluid only, 2 cases were virtually cellular, and 2 were obscuring blood. Out of 111 benign

cases, 72 were benign follicular nodules, 30 were lymphocytic thyroiditis, and 9 were granulomatous thyroiditis. 2 cases of AUS/FLUS, 2 SFN, and 5 SFM cases, and out of 11 malignant cases, 9 were papillary thyroid carcinoma and 2 were medullary thyroid carcinoma. These findings are more or less in agreement with previous studies [6,7,8].

It is reported that nodules or lesions are the weak predictors of histological malignancy. FNAC is a sensitive and highly specific method of evaluating

malignancy of thyroid lesions [9], and the false positive rate of FNAC was found to be benign lesions.

As the thyroid gland is a highly vascular organ, with each impending trauma, the chances of aspirating hemorrhagic fluid increase, so it is advised to keep the number of aspirates to a minimum [10]. It is also believed that cellularity criteria for adequacy also vary depending on whether the aspirated lesion is solid or cystic and whether the aspiration was performed under palpation or ultrasound guidance.

Aspirates that contain only cyst fluid and erythrocytes are inadequate [11]. The Bethesda system of reporting thyroid cytology is a standardized initial modality for diagnosing different thyroid lesions. It can detect benign and malignant lesions, thus avoiding unnecessary surgery for benign thyroid lesions.

### Summary and Conclusion

The present study of cytology of thyroid lesions in the Uttar Pradesh population shows that FNAC is a rapid, simple, and cost-effective diagnostic modality in the investigation of thyroid lesions with high sensitivity, specificity, and accuracy. It can be used as an excellent first-line method for investigating the nature of a lesion. The Bethesda system is very useful, as it is a simplified, systematic, standardized system for reporting cytopathology, which provides better communication between cytopathology and clinicians, leading to a more consistent approach. But this study demands further genetic, histopathologic, hormonal, nutritional, immunological, and pharmacological studies because the exact pathogenesis of thyroid lesions is still unclear.

**Limitation of study:** Owing to remote location of research centre, small number of patients, lack of latest techniques we have limited finding and results.

This research paper was approved by ethical committee of Krishna Mohan Medical College and

hospital, Pali Dungra, Sonkh Road, Mathura, Uttar Pradesh-281123.

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