



RESEARCH ARTICLE

CRITICAL ANALYSIS OF BETHESDA GRADING OF FNAC IN THYROID DISEASES WITH HISTOPATHOLOGICAL CORRELATION

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ABSTRACT

At present the Bethesda system of reporting thyroid cytopathology is widely used as a standard reporting system for FNAC. In the selection of patients for surgery, FNAC is considered the "gold standard." Despite this, histopathological examination of the thyroid gland is considered superior to FNAC in diagnosing thyroid pathologies due to pitfalls in FNAC such as scanty sample, vascularity of thyroid swelling, variation in sampling technique and skill of the performing expert, and experience of pathologist interpreting the aspirate. As a result, the purpose of this study was to investigate the cytology of palpable thyroid lesions in order to reduce surgical intervention, as well as the need for histopathological confirmation of the diagnosis in order to plan post-surgical management of malignant thyroid lesions. Materials and Methods: Representative sample of first 50 thyroid FNAC and biopsies between 1/05/22 to 30/4/23 were collected. All the patients underwent fine-needle aspiration (FNA) in our institute aspiration/ non-aspiration techniques were used. After prior written consent. Correlation of cytology finding was done with clinical & histological findings. Results: This study shows sensitivity of 100% & specificity of 97.78% of thyroid FNAC by Bethesda category compared with histopathology. Conclusion: Diagnostic accuracy of cytopathology is proven by the present study with 100% sensitivity and 97.78% of specificity. Thus, as a screening test before surgery, FNAC still needs to be followed as a routine procedure for successful patient management.

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INTRODUCTION

The thyroid gland is one of the most important endocrine organ. The term "thyroid" comes from the Greek word "thyreos," which means "shield." Thomas Wharton (1614-1673) of London, UK, was the first to use it.¹ The thyroid gland is the most common organ to cause endocrine disorders after diabetes mellitus.² Thyroid disorders are the most common endocrine diseases, especially in countries with low dietary iodine intake. Thyroid nodules are fairly common in clinical practice. More than half of the world's population has at least one thyroid nodule at some point in their lives, and the prevalence of nodular thyroid disease increases with age. Thyroid disorders include a wide range of genetic, inflammatory, developmental, immunological, and neoplastic conditions. Although the vast majority (95%) are benign, a small subset of cancerous nodules must be accurately identified for optimal and timely surgical management. Despite the large number of lesions, it is convenient to divide them into two major types: those pathologies that show a diffuse pattern of involvement and those that produce nodules in the thyroid gland.³

Diffuse enlargement of the thyroid is usually associated with conditions affecting the entire gland, such as hyperplasia and thyroiditis. Nodular lesions comprise those disorders that produce a clinical nodule and consist of non-neoplastic hyperplasias as well as benign and malignant tumors.³ Thyroid nodules are common findings in clinical practices with a prevalence of 4-7% of adult populations.⁴ Less than 5% of adult thyroid nodules are malignant and the vast majority is non-neoplastic or benign neoplasms.⁵ Pre-operative diagnosis of benign lesions is of utmost importance to avoid unnecessary surgery.⁶ Fine needle aspiration is the safest and most accurate with a sensitivity as high as 93.4% and specificity as high as 74.9% and is the first line screening and diagnostic test for patients with thyroid nodules.⁶⁻⁷ The main role of thyroid FNA is to triage patients for either surgery or conservative management.⁷ It is a reliable and cost-effective method for differential diagnosis in any thyroid pathology.⁸ The use of FNA has reduced the rate of unnecessary surgery for thyroid nodules and has doubled the percentage of cancers detected in surgically resected material.⁹ The critical issue in the management of patients with thyroid disease is thus to find a way to distinguish benign nodules from cancers prior to

surgery. In the last decade, radiological imaging, serological, and molecular studies have made significant advances in the diagnosis and management of thyroid disease patients. Except for FNA, there is no single appropriate non-invasive diagnostic test in clinical medicine that can distinguish benign (mostly approached non-surgically) from malignant (mostly managed surgically) nodules accurately, in a timely and cost-effective manner.¹⁰⁻¹¹ Thyroid cytology-Fine Needle Cytology (FNAC) has proven to be an effective first-line tool for evaluating thyroid lesions due to its low cost and high patient acceptance. Because of its high accuracy, simplicity, minimal invasiveness, quick results, and dependability, fine needle aspiration cytology has become the investigation of choice. FNAC, in particular, guided FNAC, is extremely effective in classifying patients with thyroid nodules into operative and non-operative groups. FNAC has a high rate of diagnostic accuracy indistinguishing between neoplastic and non-neoplastic thyroid lesions. It is recommended when there is a high suspicion of cancer because knowledge of cancer cell type aids in surgical procedure planning.¹²

Previously, ambiguous and inconsistent diagnostic criteria and terminology made sample interpretation and patient management difficult. There was an urgent need to standardize the reporting system, and an excellent model, the Bethesda system for Reporting Cervical Cytology, already existed. Furthermore, it was believed that a new thyroid cytopathology reporting system should be more reproducible with robust diagnostic criteria, as well as clinically relevant and informative. As a result, these requirements needed the input and approval of all major groups involved in the care of all thyroid patients, namely radiologists, endocrinologists, and endocrine surgeons.

With this context,¹³ and 40 other member experts created the framework for The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC). The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) not only assists in the reporting of thyroid lesions, but also in the implementation of appropriate treatment protocols. The Thyroid Cytopathology Reporting System (TBSRTC) is a uniform, 6-tiered reporting system with standardized nomenclature and definitions that has been widely used for the assessment and interpretation of thyroid specimens obtained from adult patients.

The system describes six diagnostic categories of thyroid lesions [Bethesda grading]

- Non-Diagnostic/ Unsatisfactory (ND/UNS)
- Benign (BN)
- Atypia of Undetermined Significance (AUS) or Follicular Lesion of Undetermined Significance (FLUS)
- Follicular Neoplasm (FN) or Suspicious of Follicular Neoplasm (SFN)
- Suspicious for Malignancy (SFM)
- Malignant (MGT)

Each category have individual implied risks of malignancy and evidence based clinical management guidelines.¹⁴ At present the Bethesda system of reporting thyroid cytopathology is widely used as a standard reporting system for FNAC.¹⁵ In the selection of patients for surgery, FNAC is considered the "gold standard."¹² Despite this, histopathological examination of the thyroid gland is considered superior to FNAC in diagnosing

thyroid pathologies due to pitfalls in FNAC such as scanty sample, vascularity of thyroid swelling, variation in sampling technique and skill of the performing expert, and experience of pathologist interpreting the aspirate.¹⁴ As a result, the purpose of this study was to investigate the cytology of palpable thyroid lesions in order to reduce surgical intervention, as well as the need for histopathological confirmation of the diagnosis in order to plan post-surgical management of malignant thyroid lesions.

MATERIALANDMETHODS

The present study "Critical Analysis of Bethesda grading of FNAC in Thyroid diseases with Histopathological correlation." – is a retrospective and prospective study carried out in the department of pathology, JNUIMSRC, Jaipur. Result of minimum 100 cases was included in the study.

METHOD OF COLLECTION OF DATA

Inclusion criteria: - All those patients having thyroid lesions, irrespective of their age and sex, referred for cytological study from ENT, Surgery OPD and admitted to ward were selected.

Exclusion criteria: - Patient not willing for fine needle aspiration cytology of their thyroid lesion, poorly preserved smear and autolyzed specimens were excluded. Patients with metastatic lesions to neck in the thyroid.

SAMPLESIZE: Representative sample of first 50 thyroid FNAC and biopsies between 1st May 2022 to 30th April 2023 were collected.

Sampling procedure: All the patients underwent fine-needle aspiration (FNA) in our institute aspiration/ non-aspiration techniques were used. After prior written consent, FNA was performed with standard technique and aseptic precautions by using 10cc disposable syringe and 23–25-gauge needle by pathologist. Aspiration was done from more than one site. Material obtained was smeared on glass slides and smears were stained with Leishman's and Hematoxylin, Eosin (H and E) and MGG stains.

Detailed cytomorphological features were studied. Correlation of cytology finding was done with clinical, imaging, biochemical, and histological findings. Material used for Histopathological examination was Thyroidectomy specimen received in surgical Histopathological section. The specimen was fixed in 10% buffered formalin. The gross examination was done. Tissue section from the specimen was embedded in paraffin. The section was routinely stained with H & E and microscopic diagnosis was done by an expert pathologist using Light Microscopy Technique.

STATISTICALANALYSIS

The data was entered in MS Excel Software and analyzed using SPSS, IBM Comp, and Version 21. The descriptive data was expressed in proportions, mean and frequency tables. The categorical data was analyzed by using Chi-Square test. The quantitative data was analyzed using independent student's T test. P value less than 0.05 was considered statistically significant.

RESULTS

The maximum lesions were in the Benign category (category II) (73) constituting 73 percent and affecting mostly the age group between 31-40 years. 19 cases were diagnosed as category 2 affecting mostly the age group between 31-40 years followed by Category VI and category IV constituting 5 and 2 percent observed mostly between age group 41-50 years and 21-30 years respectively. The result is significant at $p < 0.05$.

The various thyroid lesions were observed mostly in females. Major cases were seen in category II in which 63 cases were female and 10 cases were male out of 73 total cases followed by category IV and VI in which 8 cases each were female out of total 17 cases. The p value is < 0.001 which was highly significant. Among 100 cases, category II lesions were the major proportion constituting 73%, category I unsatisfactory smears were 6%, category III 3%, next highest percentage of cases were in category IV with 8%, category VI and category V had 9% and 1% respectively.

Distribution of patients according to Category I

	No.	%
Epidermoidcyst	1	16.67%
Non-Diagnostic	5	83.33%
Total	6	100.00%

Out of 6 cases 1 case revealed epidermoid cyst and 5 cases were nondiagnostic.

Distribution of patients according to Category II

	No.	%
Benign adenomatous goitre	1	1.37%
Benign colloidal nodule	5	6.85%
Benign nodular goitre	1	1.37%
Benign thyroid lesion	8	10.96%
Colloid cyst	1	1.37%
Colloid goitre	30	41.10%
CN	2	2.74%
Granulomatous thyroiditis	1	1.37%
Hyperplastic goitre	1	1.37%
Hyperplastic nodule	1	1.37%
Hashimoto's thyroiditis	7	9.59%
Lymphocytic thyroiditis	6	8.22%
Multinodular goitre	3	4.11%
Nodular goitre	4	5.48%
Nodular goitre OR Hashimoto's thyroiditis	1	1.37%
Subacute thyroiditis	1	1.37%
Total	73	100.00%

Maximum patients with Bethesda category II had Colloid goitre (41.10%). Benign thyroid lesion in (10.96%), hashimoto's thyroiditis (9.59%), Lymphocytic thyroiditis (8.22%).

Distribution of Patients According to Category III

	No.	%
Follicular lesion of undermined significance	1	33.33%
Follicular neoplasm	1	33.33%
Follicular lesion of undetermined significance	1	33.33%
Total	3	100.00%

Distribution of patients according to category V

	No.	%
Papillary carcinoma thyroid	1	100%
Total	1	100%

In category V (suspicious for malignancy), 1 case was of papillary carcinoma thyroid.

Distribution of patients according to Category VI

	No.	%
MTC	1	11.11%
Papillary carcinoma thyroid	8	88.89%
Total	9	100.00%

Out of 9 patients of category VI, papillary carcinoma thyroid was seen on 8(88.89%). One was MTC (11.11%).

Comparison according to histopathological and cytological findings

Bethesda Category		Cyto Findings	Histo findings
Bethesda I	Non diagnostic	1	1
Bethesda II	Adenomatous hyperplasia	1	1
	Benign adenomatous goiter	0	1
	Benign nodular goiter	3	1
	Colloid goiter	22	23
	Colloid nodule	1	1
	Hashimoto's thyroiditis	4	4
	Lymphocytic thyroiditis	1	1
	Multinodular goiter	1	1
	Granulomatous thyroiditis	1	1
	Hyperplastic goiter	1	1
	Hyperplastic nodule	1	1
	Nodular goiter	1	1
	Thyroid Adenoma	1	1
Bethesda III	Follicular lesion of undermined significance	2	2
Bethesda IV	Follicular neoplasm	3	3
Bethesda V	Suspicious for malignancy	1	H.T
Bethesda VI	Medullary thyroid carcinoma	1	1
	Papillary carcinoma thyroid	3	3
	Anaplastic carcinoma	1	1
	Total	50	50

Table Shows detail of 50 cases in which histopathology was done compare to different category of Bethesda. Only one case of Bethesda V (suspicious for malignancy) was reported in histopathology on hashimoto's thyroiditis.

Histological correlation of various Bethesda categories.

S. NO.	FNAC Bethesda category	NO. of cases	Histological findings		Concordance
			Benign	Malignant	
1.	Bethesda I	1	1	0	100%
2.	Bethesda II	38	38	0	100%
3.	Bethesda III	2	2	0	100%
4.	Bethesda IV	3	3	0	100%
5.	Bethesda V	1	1	0	0%
6.	Bethesda VI	5	0	5	100%

Cytological Diagnosis	Histological Diagnosis		Concordance %	Discordance%
	Benign	Malignant		
Category I – IV	44	0	100	0
Category V - VI	1	5	80	20

Table (B):

TABLE (B): 100% Correlation seen in all benign categories (I-IV) as well as in malignant category V. I was confirmed on Bethesda V (suspicious for malignancy) was reported on hashimoto's thyroiditis.

Sensitivity & specificity of thyroid fnac by bethesda category compared with histopathology.

Sensitivity	100%
Specificity	97.78%
Accuracy	98%

DISCUSSION

Fine needle aspiration cytology is now established as a valuable, safe and expedite test in the diagnostic management of various thyroid lesion.⁶⁶It not only decides the mode of therapy, but also determines the extent of surgery in majority of cases, considering the advantage of this technique. The present study was carried out with an aim to evaluate the role of aspiration cytology in diagnosis of various benign and malignant lesions of thyroid. In this study thyroid fine needle aspirations were categorized according to The Bethesda system, a six-tier category. Aspiration biopsy is an extension of morphological diagnosis within both cytology and histopathology. It is also a useful tool for the oncologist, who deals with undiagnosed palpable and non-palpable masses and lesion. It is a short cut to direct diagnosis and can be carried out at the clinic or bed side. It will obviate the need for radiologist and surgical procedure, save time and expenses, and allay anxiety. In the present study, cytological features of thyroid lesions were studied and correlated with Histopathological diagnosis wherever available to determine its diagnostic accuracy. This study was carried out in JNU from May 2022 to April 2023. During the study period, a total of 100 cases of thyroid fine needle aspirations were collected and categorized according to “The Bethesda System for Reporting Thyroid Cytopathology”. Later these cases were followed up with their Histopathological diagnosis.

Comparison of age incidence of thyroidlesions

In present study majority of patients were between age group 31-40 years (29%) followed by age group 41-50 years (26%) and least number of patients were of the age group 1-10, which was in concordance with the study done by Goel N *et al.*⁶⁷ in which maximum number of Thyroid lesion were noted in age group of 41-50 years (33.87%), followed by 31 to 40 years (21.77%). Similarly Raniwal A *et al.*⁶⁸ also reported 50%of total cases between 41-60 years and age above 60 years and below 20 years had lowest number of cases which was 6.67%oftotal cases. In our study age range was from 8 to 79 years comparable to Bagga and Mahajan⁵¹ and Handa *et al.*⁶⁹ who observed the incidence of thyroid lesions between 6-75 years and 5-80 years respectively. In the present study the meanage of presentation was 42.8 Years which correlated with the literature of various authors and tabulated in the table 19.

Table 19. Comparative incidence of meanage in different studies

Sl. No	Studies	MeanAge
1.	QuariFetal ⁷⁰	36.17 years
2.	WasserMH <i>etal</i> ⁷¹	44 years
3.	SureshKumaretal ⁷²	38.5 years
4.	TalepoorM. <i>etal</i> ⁷³	38.6 years
5.	DasDKetal ⁷⁴	35 years
6.	PrakashHMetal ⁷⁵	35.67 years
7.	ManojGuptaetal ⁷⁶	38.7 years
8.	Martinetal ²⁷	39.5years
9.	PresentStudy	42.8 years

Comparison of sex incidence of thyroid lesions: In present study female preponderance 80% against only 20% patients being males with male to female ratio (M:F- 1:7.33), was seen. Both the benign and malignant lesions were common in females. Similarly, Jeelani T *et al*⁶³, Mandekar *et al*⁷⁷, Sirpal Y⁷⁸ and Al Rikabi *et al*⁷⁹ also revealed female preponderance of 1:4.4, 1:6.1, 1:1.4 and 1:5.2 respectively.

Table 20. Comparative sex incidence of thyroid lesions in different studies

Study	Females	Males	TotalNo. Cases	offFemale:Male Ratio
Nazetal80	413	115	528	3.6:1
JiHyeparketal81	1217	321	1538	3.8:1
ChaudharySetal82	106	30	136	3.5:1
MeloUribeetal83	174	22	196	7.9:1
JeelaniTetal63	326	74	400	4.4:1
Presentstudy	88	12	100	7.33:1

Our study was in concordance with all the above studies, and closest to Jheelani T *et al*⁶³ and Ji Hye park *et al*⁸¹. Comparison of incidences of Thyroidlesions. In the present study, among 100 cases, category II lesions were the major proportion constituting 73%, category Iunsatisfactory smears were6%,categoryIII 3%,next highest percentage of cases were in category IV with 89%,category Vand category VI had 9%. The incidence of lesions in all categories of present study was comparable with the study of Mondol *et al.*⁸⁴ Incidence of category I lesions were far lower than the studies of Ji Hye Park *et al*⁸¹ and Vickie Y Jo⁸⁵ *et al.*, owing to the repetition of FNA if they were inconclusive. There were no lesions in category III in the present study. Our study was in concordance with all the above studies except Heider A *et al*⁶⁵ and Mondol *et al.*⁸⁴ This discrepancy can be explained because of huge difference in the sample size.

Comparison of malignancy rates: In present study, 0 cases in category II were malignant out of total 73 cases with malignancy rate 0%, in category IV, 0 cases was malignant out of total 10 cases with malignancy rate 0% and in category VI all the cases were malignant with malignancy rate 100% each. Which is in concordance with all the above studies. In our study histopathological reports an attempt was made to correlate cytological diagnosis with histopathological diagnosis. In 98 percent of the cases, exact correlation between cytological and histopathological diagnosis was found while diagnosis differed in 12 percent of the cases. Present study was very much comparable with the studies done by Sandeep R Mathur *et al*⁹², Kunori *et al*⁹⁰ and Bagga PK *et al.*⁵¹

Present study is in concordance with above all the studies, and closest to study done by Anwar⁵³ and Bakiarathana *et al.*⁶⁴ Yeoh & Chan *et al* and Anwar *et al*^{97,53} showed 90% specificity, which was similar to our study.In comparison of accuracy, sensitivity and specificity of FNAC of thyroid lesions of present study with other studies, all parameters were quite comparable. Bakhos *et al.*¹⁰² revealed 22 false negative cases out of 543 cases on histological confirmation (they also quoted cystic degeneration in papillary carcinoma as the commonest cause of false negative results. In the present study, 10 cases out of 88 were found false negative. False negatives are due to misdiagnosis of follicular carcinoma as follicular adenoma and misdiagnosis of papillary carcinoma as Goitrous lesion due to cystic degeneration in papillary carcinoma due to cystic degeneration in papillary carcinoma thyroid.

Table 21. Comparison of incidences of Thyroid lesions

Study	Bethesda I	Bethesda II	Bethesda III	Bethesda IV	Bethesda V	Bethesda VI
Parketal ⁸¹	13.3%	40.6%	9.1%	0.4%	19.3%	17.3%
VickieY Joet al ⁸³	18.6%	59%	3.4%	9.7%	23%	7%
Mondol et al ⁸⁴	1.2%	87.5%	1%	4.2%	1.4%	4.7%
ReddyPet al ⁶²	3.7%	89.2%	0.02%	2%	0.6%	4.1%
HeiderAet al ⁶⁵	7.0%	51.2%	14.9%	5.0%	4.5%	17.4%
AnandBet al ⁶⁴	13.8%	75.9%	1.2%	3.7%	2.6%	2.8%
Present study	6%	73%	3%	8%	1%	9%

Table 22. Incidence of malignancy rate

Study	I	II	III	IV	V	VI
VickieYJoet al ⁸⁵	8.9%	1.1%	17%	25.4%	70%	98.1%
Yassaetal ¹¹	10%	0.3%	24%	28%	60%	97%
Mondolet al ⁸⁴	0%	4.5%	20%	30.6%	75%	97.8%
Yangetal ⁸⁶	10.9%	7.3%	13.5%	32.2%	64.7%	98.6%
SardaAK etal ⁸⁷	24%	14%	44%	67%	77%	100%
Presentstudy	0%	0%	0%	0%	0%	100%

Table 23. Concordance between FNAC and Histopathology

S.NO	Study	Concordance Between FNAC And Histopathology
1	Harachetal ⁸⁸	58.30%
2	Schnureret al ⁸⁹	93.00%
3	Kunorietal ⁹⁰	98.00%
4	Dasetal ⁷⁴	90.00%
5	Hagetal ⁹¹	91.40%
6	SandeepRMathuretal ⁹²	97.01%
7	Mangsheetyetal ⁹³	97.56%
8	BaggaPKet al ⁸¹	96.2%
9	MassodSet al ⁹⁴	90%
10	DipanwitaDasetal ⁹⁵	80.43%
10	Presentstudy	98%

Table 24. Comparison of Accuracy, Sensitivity and Specificity of thyroid lesions

Study	Accuracy	Sensitivity	Specificity
MichaelSSableetal1997 ⁹⁶	92%	86%	91%
GPSYeohandKWChan2001 ⁹⁷	79%	56%	90%
NoorHayati2004 ⁹⁸	84.4%	78.4%	98.2%
NaggadaHA ⁹⁹	90.90%	76.50%	95%
GoelNetal ⁶⁷	97.95%	75%	100%
BakiarathanaAetal ⁶⁴	87.9%	72.4%	94.3%
AnwarK etal ⁵³	88%	85%	90%
BhattaSet al ⁶⁰	90%	85.7%	92.3%
Hadimosaurietal ¹⁰⁰	97%	80%	96%
JheelaniTetal ⁶³	83.5%	92.2%	72.82%
Fazalet al ¹⁰¹	82.92%	88.09%	77.50%
PresentStudy	98%	100%	97.78%

The difficulty indistinguishing Follicular carcinoma from its benign counterpart was experienced since capsular and vascular invasion are essential for the diagnosis of malignancy, which cannot be demonstrated on cytology. The possibility of papillary carcinoma with cystic degeneration must be kept in mind in all cystic lesions. In the present study nodular colloid goitre 51 (51%) was the commonest lesion followed by nodular goitre with Hashimoto's thyroiditis 13 (13%). Among the malignant lesions papillary carcinoma 9 (90%) was the most common carcinoma. Which was in concordance with study done by Fernandes H *et al*¹⁰³ who observed that the commonest lesion encountered in thyroid gland was nodular goitre and among the malignant neoplasms papillary carcinoma was the most common lesion, similarly Khageshwar Rout *et al*²⁹ noted that colloid goitre was most common (42.2%), followed by cystic degeneration (13.2%), papillary carcinoma presented 71.4%.

SUMMARY AND CONCLUSION

“Critical analysis of grading of FNAC in Bethesda system for thyroid diseases with histopathological correlation” was a

cross-sectional study conducted in the Department of Pathology, JNU, Jaipur, for a period of 1 year from May 2022 to April 2023. The Present study was undertaken to categorize thyroid fine needle aspirations according to “The Bethesda system” taking histopathology as the gold standard.

The salient features of the present study include:

- In our study majority of patients were between age group 31-50 years (55%) followed by age group 21-40 years (22%) and least number of patients were age group of 71-80. No case was seen in 1-10 years of age group.
- In our study female preponderance was 88% against only 12% patients being males with male to female ratio (M: F- 1: 7.33).
- In our study the maximum lesions were in the Benign category (category II) (73) constituting 73 percent and affecting mostly the age group between 31-40 years. 19 cases were diagnosed as category 2 affecting mostly the age group between 31-40 years followed by Category VI and category IV constituting 5 and 2 percent observed

mostly between age group 41-50 years and 21-30 years respectively. The result is significant at $p < 0.05$.

- In our study the various thyroid lesions were observed mostly in females. Major cases were seen in category II in which 63 cases were female and 10 cases were male out of 73 total cases, followed by category IV and VI in which 8 cases each were female out of total 17 cases. The p value is < 0.001 which was highly significant.
- Out of total 100 cases, 36 cases (36 percent) had weight loss and 53 cases (53%) felt weakness in body. 8 cases (8%) had diabetes and 6 cases each had hypertension and weight gain.
- Maximum patients were of midline thyroid swelling (40%) followed by thyroid swelling (33%), bilateral thyroid swelling (16%) and left thyroid swelling in (11%) cases.
- In our study among 100 cases, category II lesions were the major proportion constituting 73%, category I unsatisfactory smears were 6%, category III 3%, next highest percentage of cases were in category IV with 8%, category VI had 9% and 1% respectively.
- In present study out of 6 cases 1 case revealed epidermoid cyst and 5 cases were non diagnostic.
- In our study maximum patients with Bethesda category II had Colloid goitre (41.10%). Benign thyroid lesion in (10.96%), Hashimoto's thyroiditis (9.59%), Lymphocytic thyroiditis (8.22%).
- In our study out of 9 patients of category VI, papillary carcinoma thyroid was seen on 9 (90%). One was MTC (11.11%) and 1 case of anaplastic carcinoma were seen.
- The histopathological diagnosis of the 100 cases. Majority of the cases were colloid goiter which constitute 51 percent and 13 percent followed by Hashimoto's thyroiditis.
- In present study, malignancy rate of category IV was 10 percent and 90 percent for category VI.
- In the present study, the most common clinical symptom in patients with thyroid lesion was feeling of weakness in 17 (17 percent) cases, followed by weight loss present in 11 (11 percent) cases, symptoms of hypertension were present in 3 (3 percent) cases, diabetes and weight gain in 2 (2 percent) each cases were seen.
- Histopathological reports were of all 100 cases and an attempt was made to correlate cytological diagnosis with histopathological diagnosis. In 88 percent of the cases, exact correlation between cytological and histopathological diagnosis was found while diagnosis differed in 12 percent of the cases.

CONCLUSION

- Thyroid swellings are still an enigma to the surgeon and the pathologist. Diagnostic accuracy of cytopathology is proven by the present study with 100% sensitivity and 97.78% of specificity. Thus, as a screening test before surgery, FNAC still needs to be followed as a routine procedure for successful patient management.
- Category I and II in the non-neoplastic category of The Bethesda system have more accurate categorization index. Similarly, category VI had precision in the diagnosis. This indicates that there are clear-cut distinctions between the two ends of the spectrum of non-neoplastic and neoplastic lesions.

Further studies involving larger sample size and with specialized techniques is the need of the hour for patients with thyroid swelling.

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