Section: Pathology

Original Research Article

CYTOMORPHOLOGICAL SPECTRUM OF THYROID LESIONS DIAGNOSED BY FINE NEEDLE ASPIRATION CYTOLOGY IN A TERTIARY CARE CENTRE

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ABSTRACT

Background: Lesions of Thyriod gland are very common and enlargement of thyroid gland indicates the presence of an underlying disease. FNAC can be used as a triage to distinguish between various types of Thyroid lesions, as it is a simple and economical procedure.

Materials and Methods: This study was carried out in the Department of Pathology, in the newly established Government Medical College and Hospital, Rajamahendravaram, Andhra Pradesh, India. A total 62 patients presenting with Thyroid enlargement were subjected to FNAC procedure of the taking history and doing general and local examination. Smears were prepared, stained and Cytological Diagnosis was made.

Result: Most of the patients presenting with Thyromegaly were in the age group of 31-40years. The most common lesion diagnosed was Adenomatous Goitre. Malignancies formed 8.06% of all cases.

Conclusion: FNAC is a rapid and economic technique to diagnose the etiology of various types of Thyroid Lesions and also to classify the lesions as NonNeoplastic and Neoplastic. It also reduces the need for unnecessary surgical intervention in many cases, as diagnosis can be made easily by Cytomorphological examination.

Keywords: Cytology, Thyroid, Goitre, Carcinoma.

INTRODUCTION

Incidence of Thyroid Lesions is increasing in the recent times with a steady rise of both Non Neoplastic and Neoplastic Thyroid Disorders. Fine Needle Aspiration Cytology is the preliminary investigation for diagnosing any Thyroid disorder and differentiating a Non Neoplstic Lesion from a Neoplastic Lesion. Most of the cases of Papillary Carcinoma of Thyroid are now presenting at a later age. Rise in the incidence of Lymphocytic Thyroiditis at younger age group has become common.

The primary objective of Fine Needle Aspiration Biopsies of thyoid is to select patients who require surgery for a neoplastic disorder from those who have a functional or inflammatory abnormality and who can be followed clinically or treated medically.[1] FNAC plays a vital role in deciding which nodules should be referred for surgery.[2]

FNAC is also useful in the diagnosis and monitoring of Autoimmune Thyroid Lesions, especially in clinically equivocal cases and cases where biochemical and immunological parameters are normal or marginally normal or marginally abnormal.[3]

This study was done to evaluate the spectrum of various types of Thyroid Lesions by Fine Needle Aspiration Cytology (FNAC).

MATERIAL AND METHODS

This is a 1-year prospective study from January 2023 to December 2023 by FNAC on the patients attending the outpatient departments and hospitalized patients presenting with palpable thyroid gland, in the newly established Government Medical College and Hospital, Rajamahendravaram, Andhra Pradesh, India.

A total of 62 patients had undergone Fine Needle Aspiration Cytology, after taking history and doing general and local examination. A written informed consent was taken from all the patients.

Aspiration was done by Needling Technique and smears were prepared. A total of 6 smears were made for each case out of which 4 were fixed in 95% alcohol to the stained by Heamatoxylin and Eosin (H&E) stain (2smears) and Papaniculaou Stain (2 smears).

Remaining 2 smears were air dried and stained with May Grunwald Giemsa stain.

The standard protocol was followed for staining all the smears. The smears thus stained were studied under microscope and a Cytological Diagnosis was made. Lesions were classified accordingly as Non Neoplastic and Neoplastic.

RESULTS

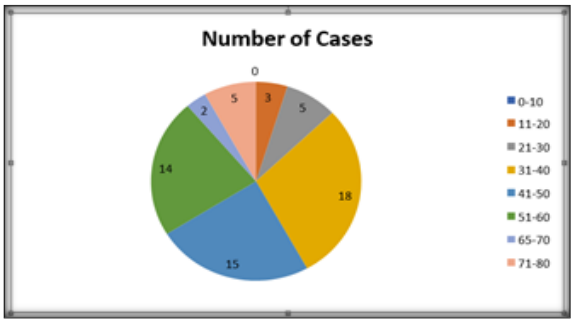


Figure 1

Most of the cases (18) belonged to the age group of 31-40yrs, accounting to 29.03% of all cases

Figure 2

There was female preponderance (56 cases) as compared to males (6 cases)

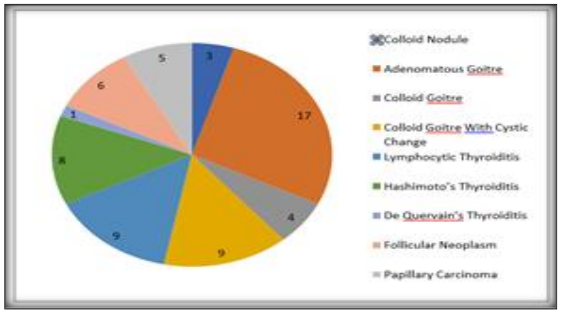


Figure 3:

Most common lesion was Adenomatous Goitre (17 Cases), accounting to 27.41% of all cases

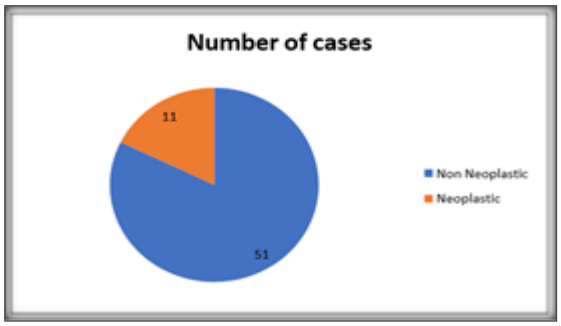


Figure 4:

82.25% of all Thyroid Lesions were Non Neoplasic, whereas 17.75% were Neoplastic.

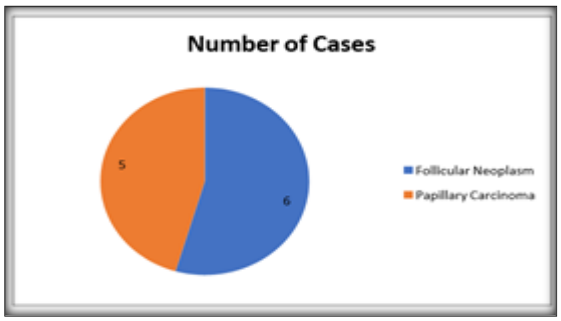


Figure 5

54.55% of all Neoplastic Lesions of Thyroid Gland were Follicular Neoplasms.

Figure 6

All the Cases reported as Malignant were Papillary Carcinoma of Thyroid Gland (100%).

Total number of cases: 62

Table 1: Age Distribution of Cases

Cases	Age group in years								
	0-10	11-20	21-30	31-40	41-50	51-60	65-70	71-80	Total
Number of Cases	-	3	5	18	15	14	2	5	62
Percentage Of Cases	0	4.83 %	8.06 %	29.03 %	24.19 %	22.61 %	3.22 %	8.06 %	100 %

Table 2: Sex Wise Distribution of Cases

Cases	Males	Females	Total
Number of cases	6	56	62
Percentage	9.68%	90.32%	100%

Table 3: Distribution of Non Neoplastic/Neoplastic Cases based on Diagnosis by FNAC

	NON NEOPLASTIC							NEO PLASTIC		
Cases	**Colloid Nodule**	**Adenomatous Goitre**	**Colloid Goitre**	**Colloid Goitre With Cystic Change**	**Lymphocytic Thyroiditis**	**Hashimoto's Thyroiditis**	**De Quervain's Thyroiditis**	**Follicular Neoplasm**	**Papillary Carcinoma**	**Total**
Number of Cases	3	17	4	9	9	8	1	6	5	62
Percentage	4.83 %	27.41 %	6.45 %	14.51%	14.51 %	12.90 %	1.66 %	9.67 %	8.06 %	100 %

Table 4: Distribution of Non Neoplastic/Neoplastic Thyroid Lesions

Type of Thyroid lesion	Number ofcases	Percentage
Non Neoplastic	51	82.25%
Neoplastic	11	17.75%
Total	**62**	**100%**

Table 5: Distribution of Neoplastic Lesions of Thyroid Gland

Cases	Diagnosis	Number ofcases	Percentage
Neoplastic lesions	Follicular Neoplasm	6	54.55
	Papillary Carcinoma	5	45.45%
Total		11	100%

Table 6: Distribution of Malignant Neoplasms of Thyroid Gland

Cases	Papillary Carcinoma	Others	Total
Number of Cases	5	-	5
Percentage	100%	-	100%

DISCUSSION

Thyroid enlargement may be caused due to many diseases ranging from acute to chronic inflammatory or infective lesions and benign to malignant lesions.

Most of the cases in our study belonged to the age group of 31-40 years, accounting to 29.03% of all cases.

Similar findings were seen in studies by Vaishali Jain et al,[4] (35.15%), Jeya Shambavi et al,[6] (32.8%), Amita Patel et al,[7] (29.3%), Chakrabarti PR et al,[8] (27.9%), Shete Smita et al,[9] (32.12%) and Ranjan Agrawal et al(10) (28.8%).

Most of the thyroid lesions showed a female preponderance in our study with 90.32% of all cases being females.

Similar findings were found in studies by Vaishali Jain et al,[4] (86.06%), Jeya Shambavi et al,[6] (92.09%), Amita Patel et al,[7] (78.98%), Chakarbarti PR el al,[8] (81.1%), Shete Smita et al(9) (90.90 %), Ranjan Agrawal el al(10) (80.7%), Richa Bhartiya et al,[11] (82.35%), Naik Reena et al,[12] (87.25%), Jyothi Shrivastava et al(13) (82.55%) , Pooja Agrawal et al,[14] (89.6%) and Akshata N,[15] (88.11%).

Thyroid diseases occur more commonly in women than in men. The gender difference can be accounted for, in part, by the auto immune nature of many thyroid disorders, which may be due to effect of sex steroids on immune system. Oestrogen and Progesterone appear to modulate the differentiation and maturation of lymphocytes as well as induction of the auto immune response.[5]

Adenomatous Goitre was the most common lesion diagnosed in our study, accounting to 27.41% of all cases. Similar findings were found in study by Naik

Reena at,[12] with 30.92% of cases diagnosed as, Adenomatous Goitre.

Studies by Vaishali Jain et al,[4] Amita Patel et al,[7] Ranjan Agrawal et al,[10] Jyoti Shrivastava et al,[13] Pooja Agrawal et al(14) and Akshata N et al,[15] showed Colloid Goitre as the most common lesion with 40.6%, 56.6%, 29.16%, 35.38%, 49.2% and 67.3% of cases respectively.

Non Neoplastic Lesions of the Thyroid Gland accounted for 82.25% of all Thyroid lesions, with 17.75% of cases being Neoplastic lesions. Similar finding were observed in studies by Vaishali Jain et al,[4] Jeya Shambavi et al,[6] Chakrabarti PR et al,[8] Shete Smita et al,[9] Ranjan Agrawal et al,[10] Richa Barthiya et al,[11] Naik Reena et al,[12] Jyoti Shrivastava et al,[13] with 81.81%, 87.1%, 86.56%, 88.5%, 87.90%, 84%, 88.72%, 80.1%, cases diagnosed as Non Neoplastic Lesions of Thyroid Gland respectively.

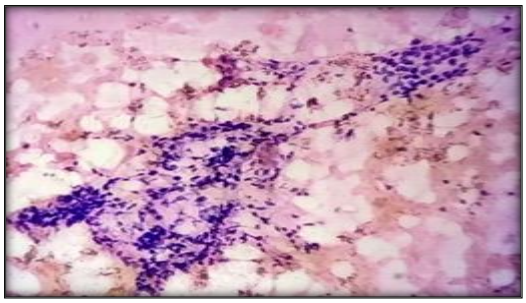
In our Study, Follicular Neoplasms formed 54.55% cases of all Neoplastic Lesions whereas Malignancies accounted to 45.45% of all Neoplastic Lesions.

Similar findings were observed in study by Jyoti Shrivastava et al,[13] in which 57.14% of cases were Follicular Neoplasms and 42.86% cases were malignancies.

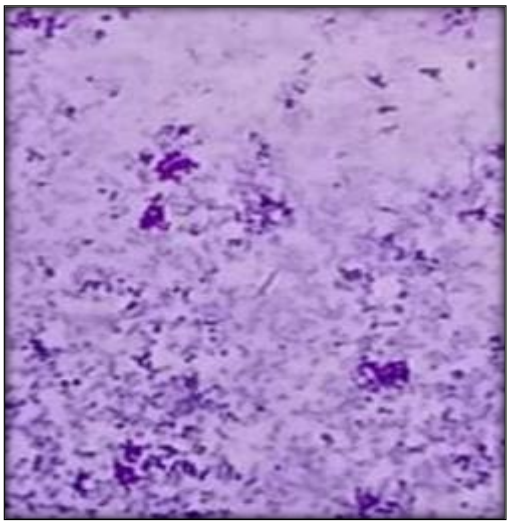
Studies by Vaishali Jain et al,[4] Jeya Shambavi et al,[6] Chakrabarti PR et al,[8] Shete Smita et al,[9] Ranjan Agrawal et al,[10] Richa Barthiya et al,[11] Naik Reena et al,[12] Pooja Agrawal et al,[14] Akshata N et al,[15] showed 64.25%, 26.31%, 82.61%, 70%, 63.64%, 46.66%, 70.58%, 69.23% and 69.3% of all Neoplastic Lesions as Follicular Neoplasms.

All the five malignant lesions diagnosed in our study were Papillary Carcinomas of Thyroid, where as studies by Vaishali Jain et al,[4] showed 66.66% , Jeya Shambavi et al,[6] 85.71% , Chakrabarti PR et al,[8] 50%, Shete Smita et al,[9] 66.66% , Ranjan Agrawal et al,[10] 25%, Richa Bhartiya et al,[11] 50%, Naik Reena et al,[12] 80% and Pooja Agrawal et al,[19] 75% of cases as Papillary Carcinoma of Thyroid Gland.

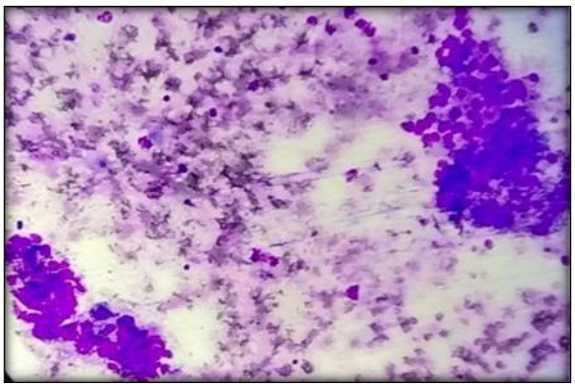
All cases diagnosed as Papillary Carcinoma of Thyroid Gland were between age group of 40-80 yrs in our study, in contrast to study by Elizabeth Mathew et al,[16] in which peak incidence of cases were seen in the age group of 30-40 yrs, the causes of which should be ascertained.



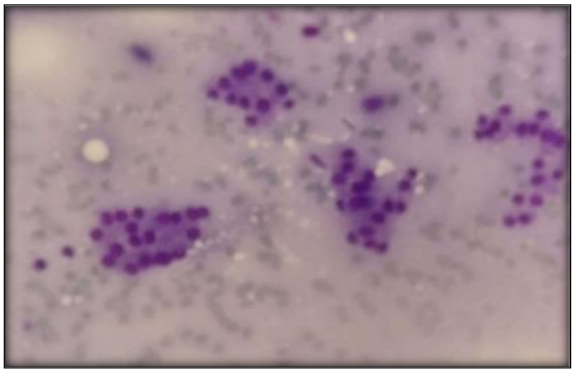
De Quervain's Thyroiditis (H&E Stain:40X)



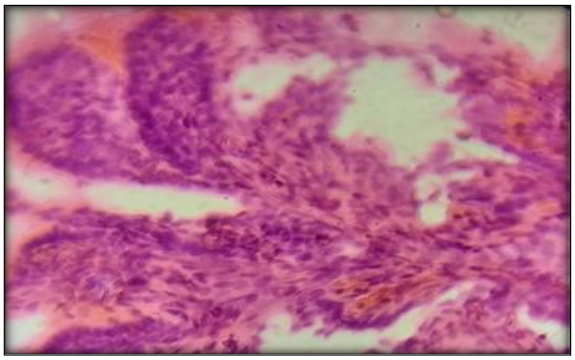
Colloid Goitre (MGG Stain: 10X)



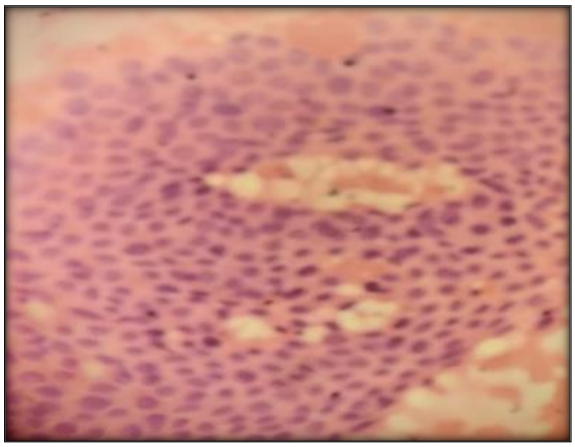
Adenomatous Goitre (MGG Stain: 40X)



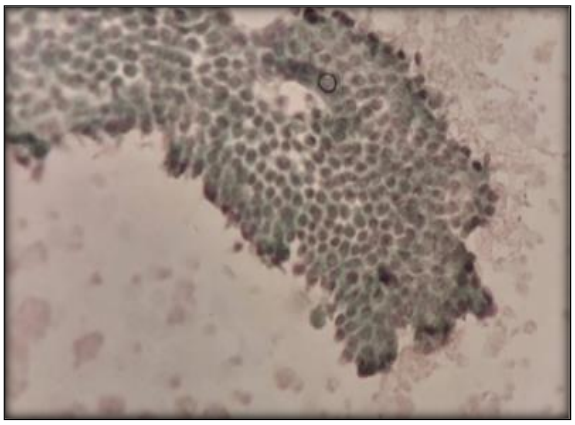
Follicular Neoplsams (MGG Stain: 10 X)



Papillary Carcinoma of Thyroid (H&E Stain: 10 X)



Papillary Carcinoma of Thyroid (H&E Stain: 40 X)



Papillary Carcinoma of Thyroid (Papaniculaou Stain: 40 X)

Table 7

Studies	% of cases in age of 31-40 years
Vaishali Jain et al[4]	35.15%
Jeya Shambavi et al[6]	32.8%
Amita Patel et al[7]	29.3%
Chakrabarti PR et al[8]	27.9%
Shete Smita et al[9]	32.12%
Ranjan Agrawal et al[10]	28.8%
Present study	29.03%

Table 8

Studies	Percentage of cases showingfemale preponderance
Vaishali Jain et al[4]	86.06%
Jeya Shambavi et al[6]	92.09%
Amita Patel et al[7]	78.98%
Chakarbarti PR el al[8]	81.1%
Shete Smita et al[9]	90.90%
Ranjan Agrawal el al[10]	80.7%
Richa Bhartiya et al[11]	82.35%
Naik Reena et al[12]	87.25%
Jyothi Shrivastava et al[13]	82.55%
Pooja Agrawal et al[14]	89.6%
Akshata N[15]	88.11%
Present study	90.32%

Table 9

Studies	Cytological Diagnosis	Percentage of mostCommon Lesions
Naik Reena at[12]	Adenomatous Goitre	30.92%
Vaishali Jain et al[4]	Colloid Goitre	40.6%
Amita Patel et al[7]	Colloid Goitre	56.6%
Ranjan Agrawal et al[10]	Colloid Goitre	29.16%
Jyoti Shrivastava et al[13]	Colloid Goitre	35.38%
Pooja Agrawal et al[14]	Colloid Goitre	49.2%
Akshata N et al[15]	Colloid Goitre	67.3%
Present study	Adenomatous Leone	27.41%

Table 10

Studies	Percentage of cases Diagnosed as Non Neoplastic Lesions
Vaishali Jain et al[4]	81.81%
Jeya Shambavi et al[6]	87.1%

Chakrabarti PR et al[8]	86.56%
Shete Smita et al [9]	88.5%
Ranjan Agrawal et al [10]	87.90%
Richa Barthiya et al [11]	84%
Naik Reena et al[12]	88.72%
Jyoti Shrivastava et al[13]	80.1%
Present study	82.25%

Table 11

Studies	Follicular Neoplasm (%)	Malignancies (%)
Jyoti Shrivastava et al[13]	57.14%	42.59%
Vaishali Jain et al[4]	64.25%	35.75%
Jeya Shambavi et al[6]	26.35%	73.65%
Chakrabarti PR et al[8]	82.61%	17.39%
Shete Smita et al [9]	70.1%	30%
Ranjan Agrawal et al [10]	63.41%	36.59%
Richa Barthiya et al [11]	46.66%	53.34%
Naik Reena et al[12]	70.58%	29.42%
Pooja Agrawal et al[14]	69.23%	30.77%
Akshata N et al[15]	69.30%	30.70%
Present study	54.55%	45.45%

Table 12

Studies	Papillary Carcinoma	Medullary Carcinoma	Anaplastic Carcinoma
Vaishali Jain et al[4]	6	-	3
Jeya Shambavi et al[6]	12	2	-
Chakrabarti PR et al[8]	2	1	1
Shete Smita et al [9]	2	1	-
Ranjan Agrawal et al [10]	1	1	2
Richa Barthiya et al [11]	2	1	1
Naik Reena et al[12]	4	1	-
Pooja Agrawal et al[14]	3	1	-
Present Study	5	-	-

CONCLUSION

Some cases of Malignancies may have been missed in our study, as the FNAC Procedure done by us was not an Ultra Sound Guided one, but still FNAC is one of the best preliminary investigation to diagnose Thyroid Lesions as it helps in differentiating Non Neoplastic Lesions from Neo plastic Lesions and this procedure also reduces unnecessary Surgical Interventions in many cases.

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