



Study of Fine Needle Aspiration Cytology of Thyroid Lesions and Their Relationship With Various Demographic Factors In A Tertiary Health Care Centre In North India

¹Dr Shagufta Chowdhary MD Pathology GMC jammu

² Dr Rashmi Aithema MD Pathology GMC Jammu

³ DR Saloni Mahajan MD Pathology GMC jammu

ABSTRACT:

BACKGROUND presence of thyroid lesion is a very common complaint in clinical practice especially in females in North Indian region, its diagnosis is commonly made on FNAC which is a minimally invasive technique performed on OPD basis easily.

AIM: To study various thyroid lesions and their relationship with various demographic factors in the North Indian region.

MATERIAL AND METHOD: The present study is a prospective study done in the postgraduate Department of Pathology of GMC Jammu from Dec 2020 to Nov2021. 146 cases were studied during this period in each case clinical history and physical examination was done before performing the FNAC (Ultrasound guided FNAC where ever required), due consideration was given to various demographic factors. And final reporting was done by The Bethesda System which is a uniform reporting system for thyroid cytology. **RESULTS:** Out of 146 cases 17.8% were males and 82.2% females, maximum cases were from age group of 21 to 30 years i.e 28.7 % followed by 31 to 40 years i.e 21.9% and least above 70 years and below 10 years age group i.e 1.3% each. 31.5% belonged to rural area and 68.4 % to urban area. 71.2% benign (cat 2) and 12.3% malignant (cat 6), 6.8% non- diagnostic (cat 1), 2.7% AUS/FLUS (cat 3), 5.4% FN/SFN (cat 4) and 1.36% suspicious for malignancy (cat 5).

KEY WORDS: Fine needle aspiration cytology (FNAC), Atypia of undetermined significance or follicular lesion of undetermined significance (AUS/FLUS), Follicular Neoplasm or Suspicious for a follicular Neoplasm (FN/SFN).

Received 15 May, 2022; Revised 28 May, 2022; Accepted 30 May, 2022 © The author(s) 2022.

Published with open access at www.questjournals.org

I. INTRODUCTION:

Thyroid lesions are very commonly encountered in clinical practice ranging from benign thyroid nodules to colloid goitre and malignant thyroid lesions, more common in females. Thyroid nodules show a prevalence of 2% to 5% for palpable thyroid nodules and 19% to 46% for nodules detected by thyroid ultrasonography. FNAC is simple, easy to perform, non-invasive and cost-effective procedure. FNAC is considered to be the “gold standard” in the selection of patients for surgery. Any solitary or dominant thyroid nodule larger than 1 cm should have cytology done. FNAC is the most cost-effective minimally invasive pre-operative investigation, whose simplicity and safety justify its use for “selective” surgery and is considered the “gold standard” in the management of thyroid nodules. FNAC is usually performed on OPD basis without local anesthesia and the patient does not require any previous preparation. FNAC can be used to diagnose thyroid lesions ranging from benign nodular goitres, cysts, thyroiditis and neoplasms (papillary, medullary, anaplastic, poorly differentiated and metastatic malignancy) with high degree of accuracy based on cyto-morphological features. The Bethesda system is used to categorise the thyroid lesions and helps in better communication between clinicians and pathologists for the best surgical and medical management. The Bethesda system is categorised into 6 categories: I. Non-diagnostic or Unsatisfactory,

II. Benign, III. Atypia of Undetermined Significance or Follicular Lesion of Undetermined Significance,

IV. Follicular Neoplasm or Suspicious for a Follicular Neoplasm, V. Suspicious for Malignancy
VI. Malignant.

The present study aim to see various thyroid lesions and their relationship with various demographic factors in the North Indian region.

II. MATERIAL AND METHOD:

The present study is a prospective study done in the Postgraduate Department of Pathology of GMC Jammu from Dec 2020 to Nov2021. 146 cases were studied during this period in each case clinical history and physical examination were done before performing the FNAC (Ultrasound guided FNAC where ever required), due consideration was given to various demographic factors. And final reporting was done by The Bethesda System of thyroid cytology reporting.

III. RESULTS:

Out of 146 cases, maximum cases were from age group of 21 to 30 years i. e 28.7 % followed by 31 to 40 years i. e 21.9% and least above 70 years and below 10 years age group i. e 1.3% each [Table 1]. 17.8% were males and 82.2% females [Table 2]. 31.5% cases belonged to rural area and 68.4 % to urban area [Table 3]. Bathisda system of thyroid cytology reporting of the sample studied showed 71.2% benign (cat 2) and 12.3% malignant (cat 6),6.8% non- diagnostic (cat 1),2.7% AUS/FLUS(cat 3),5.4%FN/SFN(cat 4) and 1.36% suspicious for malignancy (cat 5) as shown in [Table 4].

Table 1: Age Distribution of Patients of Study Sample

Age(years)	No. of patients	Percentage(%)
<10	2	1.36%
11-20	18	12.3%
21-30	42	28.7%
31-40	32	21.9%
41-50	26	17.8%
51-60	10	6.8%
61-70	14	9.5%
>70	2	1.36%

Table 2: Sex distribution of patients of study sample

Sex	No. of patients	Percentage(%)
Male	26	17.8%
Female	120	82.2%

Table 3: Demographic distribution of patients

Region	Number	Percentage(%)
Urban	100	68.49%
Rural	46	31.5%

Table 4: Cytological Categorisation of lesions according to the Bathisda system of thyroid cytology reporting

Category	No of cases	Percentage(%)
Cat 1	10	6.8%
Cat 2	104	71.2%
Cat 3	4	2.7%
Cat 4	8	5.4%
Cat 5	2	1.36%
Cat 6	18	12.3%

IV. DISCUSSION:

In our study majority cases were reported to be colloid goitre followed by papillary carcinoma thyroid. Others included autoimmune thyroiditis, 2 cases in the category of AUS/FLUS, 4 FN/SFN, 1 Medullary carcinoma thyroid, 1 suspicious for malignancy for which biopsy was advised and 5 cases were reported as non-diagnostic/unsatisfactory for which repeat aspiration was advised. Fine needle aspiration cytology is the fundamental method for evaluation of thyroid nodules. Examination of material obtained by FNAC enables to differentiate between benign and malignant lesions. Wrong detection and poor aspiration technique cause most of the negative reports. Ultrasound guidance allows continuous visualization of needle during insertion and sampling which results in pinpoint accuracy and improves final diagnosis. In the present study, age of the patients ranged from 9-84 yrs with a mean age of 38.5 years. According to Dorairajan and Jayshree , majority (36%) of their patients were in the age group of 30-40 years, which is in conformity with our study in which

maximum number of patients (30.94%) were from age group of 20 to 40 yrs. Age distribution and mean age of the present study was comparable to A Martinek *et al.* but lower than Nicholas J Screamton *et al.* and Laurence *et al.*

In the present study majority were females numbering 120 whereas 26 were male, forming a male to female ratio of 1:4.6. Sex distribution, was comparable to study by Laurence *et al.*

Table 5: Showing age range and median age of different studies and present study

Study	Age range	Mean age
Nicholas J screamton et al	14-80	48
A Martinek et al	13-87	38.6
Laurence et al	16-83	49.5
Present study	9-85	37.7

Age distribution and mean age of the present study was comparable to A Martinek *et al.* study but the mean age was lower when compared to , Nicholas J Screamton *et al.* and Laurence *et al.*

Table 6: Showing sex distribution and male to female ratio of different studies and present study

Study	Total no of patients	Male	Female	M:F
A Martinek et al	245	52	193	1:3.7
Laurence et al	450	78	372	1:4.76
Hatada et al	72	7	63	1:9
Antonello et al	325	31	294	1:9.4
Present study	146	26	120	1:4.6

In the present study majority were females numbering 120 whereas 26 were male, forming a male to female ratio of 1:4.6. Sex distribution, was comparable to study by Laurence *et al.* over all the studies showed more female preponderance than males.

V. Conclusion:

The study comprised of 146 cases presented with thyroid lesions who were subjected to FNAC and USG guided FNAC and following conclusions were inferred.

1. More females were effected then males.
2. Maximum patients were of the age group of 21 years and 50 years and least <10 and >80.
3. Benign conditions were more than malignant.
4. There is definite relationship between thyroid lesions and demography.
5. In majority cases FNAC provides final diagnosis and biopsy is not required.

References;

- [1]. Rojeski MT, Gharib H; Nodular thyroid disease. Evaluation and management. N Engl J Med.,1985; 313(7): 428-436.
- [2]. Brander A, Viikinkoski P, Tuuhea J, Voutilainen L, Kivisaari L; Clinical versus ultrasound examination of the thyroid gland in common clinical practice. J Clin Ultrasound,1992; 20(1): 37-42.
- [3]. Khurana KK, Richards VI, Chopra PS, Izquierdo R, Rubens D, Mesonero C; The role of ultrasonography-guided fine-needle aspiration biopsy in the management of nonpalpable and palpable thyroid nodules. Thyroid, 1998; 8(6): 511-515.
- [4]. **Irfan Khan *et al.*, Sch. J. App. Med. Sci., 2014; 2(4D):1441-1444**
- [5]. Khan S, Maheshwari V, Aziz M, Husain M, Verma AK; Cytology of thyroid lesions with emphasis on non-aspiration technique. J Cytol., 2004; 21(4):179-182.
- [6]. Mathur SR, Kapila K, Verma K; Role of Fine Needle Aspiration Cytology in the diagnosis of goiter. Indian J Pathol Microbiol., 2005; 48(2): 166-169.
- [7]. Jogai S, Al-Jassar A, Temmim L, Dey P, Adesina AO, Amanguno HG; Fine needle aspiration cytology of thyroid: A cytohistologic study with evaluation of discordant cases. Acta Cytol., 2005; 49(5): 483-488.
- [8]. Gagnetten CB, Roccatagliata G, Lowenstein A, Soto F, Soto R; The role of fine needle aspiration biopsy cytology in the evaluation of the clinically solitary thyroid nodule. Acta Cytol., 1987; 31(5): 595-598.
- [9]. Ko HM, Jhu IK, Yang SH, Lee JH, Nam JH, Juhng SW *et al.*; Clinico-pathologic analysis of fine needle aspiration cytology of the thyroid. A review of 1,613 cases and correlation with histopathologic diagnoses. Acta Cytol., 2003; 47(5): 727-732.
- [10]. Suen KC; Fine needle aspiration biopsy of the thyroid. Canadian Medical Association Journal, 2002; 167(5): 491-495.
- [11]. Lew JI, Rodgers SE, Solorzano CC; Developments in the use of ultrasound for thyroid cancer. Curr Opin Oncol., 2010; 22(1): 11-16.
- [12]. Izquierdo R, Arekat MR, Knudson PE, Kartun KF, Khurana K, Kort K *et al.*; Comparison of palpation-guided versus ultrasound-guided fineneedle aspiration biopsies of thyroid nodules in an outpatient endocrinology practice. Endocr Pract., 2006; 12(6): 609-614.
- [13]. Harsoulis P, Leontsini M, Economou A, Gerasimidis T, Smbaronis C; Fine needle aspiration biopsy cytology in the diagnosis of thyroid cancer: Comparative study of 213 operated patients. Br J Surg., 1986; 73: 461-464.
- [14]. Cochand-Priollet B, Guillausseau PJ, Chagnon S, Hoang C, Guillausseau-Scholer C, Chanson P *et al.*; The diagnostic value of fine-needle aspira-tion biopsy under ultrasonography in nonfunctional thyroid nodules: a prospective study comparing cytologic and histologic findings. Am J Med., 1994; 97 (2):152-157.
- [15]. Alexander EK, Heering JP, Benson CB, Frates MC, Doubilet PM, Cibas ES *et al.*; Assessment of nondiagnostic ultrasound-guided fine needle aspirations of thyroid nodules. J Clin Endocrinol Metab., 2002; 87(11): 4924-4927.

- [16]. Kantasueb S, Sukpan K, Mahanupab P; The study of thyroid lesions and the correlation between histopathological and cytological findings at Maharaj Nakorn Chiang Mai Hospital between 2003 and 2007. *Chiang Mai Med J.*, 2010; 49(3): 105-110.
- [17]. Kamenov ZA, Karamfilova VN, Chavrakov GN; Ultrasound guided fine-needle aspiration biopsy in unselected consecutive patients with thyroid nodules. *ISRN Endocrinol.*, 2011; 2011: 284837.
- [18]. Martínek A, Dvoráková J, Honka M, Horáček J, Klvana P; Importance of guided fine needle aspiration cytology (FNAC) for the diagnosis of thyroid nodules-own experience. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub.*, 2004; 148(1): 45-50.
- [19]. Hanbidge AE, Arenson AM, Shaw PA, Szalai JP, Hamilton PA, Leonhardt C; Needle size and sample adequacy in ultrasound-guided biopsy of thyroid nodules. *Can Assoc Radiol J.*, 1995; 46(3): 199-201.
- [20]. Dorairajan N, Jayashree N; Solitary nodule of the thyroid and the role of fine needle aspiration cytology in diagnosis. *J Indian Med Assoc.*, 1996; 94(2): 50–52.
- [21]. Hatada T, Okada K, Ishii H, Ichii S, Utsunomiya J; Evaluation of ultrasound –guided fine needle aspiration biopsy for thyroid nodules. *Am J Surg.*, 1998; 175(2): 133-136.
- [22]. Screamon NJ, Berman LH, Grant JW; US-guided core-needle biopsy of the thyroid gland. *Radiology.* 2003; 226(3): 827-832.
- [23]. Laurence LH, Gilles H, Brigitte F; Indications and limits of ultrasound-guided cytology in the management of nonpalpable thyroid nodules 1998; 84(1): 24-28.
- [24]. Ali SZ, Cibas ES. *The Bethesda System for Reporting Thyroid Cytopathology*. New York, NY: Springer. In press.
- [25]. Baloch ZW, LiVolsi VA, Asa SL, et al. Diagnostic terminology and morphologic criteria for cytologic diagnosis of thyroid lesions: a synopsis of the National Cancer Institute Thyroid Fine-Needle Aspiration State of the Science Conference. *Diagn Cytopathol.* 2008;36:425-437.
- [26]. Baloch ZW, Cibas ES, Clark DP, et al. The National Cancer Institute Thyroid Fine Needle Aspiration State of the Science Conference: a summation. *Cytojournal.* 2008;5:6. doi:10.1186/1742-6413-5-6.
- [27]. Goellner JR, Gharib H, Grant CS, et al. Fine-needle aspiration cytology of the thyroid, 1980 to 1986. *Acta Cytol.* 1987;31:587-590.