|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article
Volume 4, Issue 5; May: 2020; Page No. 110-112

TO STUDY THYROID CYTOLOGY BY CONVENTIONAL METHOD AND APPLYING BETHESDA SYSTEM TO SAME SMEARS.

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Article Info: Received 08 April 2020; Accepted 25 May 2020
DOI: https://doi.org/10.32553/ijmbs.v4i5.1142
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Conflict of interest: No conflict of interest.

Abstract

Method: The thyroid cytology smears reported at the Department of Pathology Index medical College over a two year period from May 2015 to June 2017 and a prospective thyroid FNAC smears from Sep 2017 to Aug 2019 were studied at the Department of Pathology Index Medical College.

The conventional and Bethesda system for reporting thyroid cytopathology were followed for reporting. A comparison of old conventional reporting system and Bethesda system were then analyzed.

Result: In Bethesda System None of the patients in both the group showed Inadequate diagnosis which was seen in the retrospective group using conventional system. Bethesda System has revealed that out of 81 patients with Benign Lesion, 41 (50.6%) were in retrospective group and 40 (49.4%) were in prospective group. Malignant was present in 2 (40%) and 3 (60%) patients in Retrospective and prospective group. Similarly out of 4 patients with Follicular Neoplasm, 3 (75%) and 1 (25%) were in retrospective and prospective group. However the distribution was comparable between both the groups.

Conclusion: Adapting the Bethesda system of reporting has led to a high to sensitivity, specificity and high negative predictive values. Use of Bethesda systems helps in the prognosis, management and minimizes the unnecessary surgical procedures of thyroid swelling.

Keywords: Thyroid, Cytology, Bethesda & Smears.

Introduction

Thyroid disorder is a group of genetic, neoplastic, immunological and developmental ailments. The understanding of these disorders is of immense importance because most are amenable to medical or surgical management. Fine needle aspiration cytology (FNAC) is widely considered as the diagnostic technique of choice in the assessment of thyroid lesions. Fine needle aspiration cytology has become the investigation of choice because of its high accuracy, simplicity, minimal invasiveness, quick result and reliability. [1]

FNAC has high rates of diagnostic accuracy to differentiate between neoplastic and non –neoplastic lesions of thyroid. It is recommended when suspicion of cancer is very high because fore knowledge of cancer cell type aids in the planning of surgical procedure. FNAC with a sensitivity of 93.4%, a positive predictive value of malignancy of 98.6% and a specificity of 74.9%, has diminished the number of surgeries done for benign lesions and increased the proportion of malignancies in surgically resected specimens. Also cytological reports can and have been used to plan definitive surgery. [2]

The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) was came out of National Cancer Institute State of Science Conference in 2007 on thyroid FNA, it defines the consensus diagnostic terminology and morphologic criteria. [3]

TBSRTC list out the uniform diagnostic terminologies for communication between pathologists and clinicians. TBSRTC defines six diagnostic categories together with non-diagnostic(ND) or unsatisfactory (UNS), benign, atypia of undetermined significance (AUS) or follicular lesion of undetermined significance (FLUS), follicular neoplasm (FN) or suspicious for FN, suspicious for malignancy (SM) and malignant. Every category is linked with a specific possibility of cancer and its management. With the implementation of universal morphological criteria and equivalent risk categorization, TBSRTC helps pathologist and clinicians with suitable information for management of it. [4]

Material & Method

Study conducted at Index Medical College, Hospital & Research Centre, Indore, Madhya Pradesh from September 2017 to August 2019.

Inclusion Criteria: All previous Smears from thyroid FNAC and patients reported for thyroid nodule FNAC.

Sample Size: 100 patients were studied during the course of the study

Methodology: The thyroid cytology smears reported at the Department of Pathology Index medical College over a two year period from May 2015 to June 2017 and a prospective thyroid FNAC smears from Sep 2017 to Aug 2019 were studied at the Department of Pathology Index Medical College.

The conventional and Bethesda system for reporting thyroid cytopathology were followed for reporting. A comparison of old conventional reporting system and Bethesda system were then analyzed.

Data Collection: All cases of Thyroid with fine needle aspiration cytology (FNAC) and the smears were received / reported by Conventional method and Bethesda system of reporting. The conventional method used at our centre includes description of microscopic findings of these cases along with impression at the end. The categorization according to the Bethesda system of reporting thyroid cytology were done using criteria published in the atlas and recent literature. The cytological diagnosis then was correlated with the Histological diagnosis wherever it is available.

In October 2007, The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) was discussed and finalized in a conference.

Results

Table 1: Comparing age between groups

Age of patients	Group		Total	P value
	Retrospective	Prospective		
<20	2 (33.)	4 (66.7)	6 (100)	0.668
>60	1 (50)	1 (50)	2 (100)	
21-30	14 (46.7)	16 (53.3)	30 (100)	
31-40	22 (61.1)	14 (38.9)	36 (100)	
41-50	9 (42.9)	12 (57.1)	21 (100)	
51-60	2 (40)	3 (60)	5 (100)	
Total	50 (50)	50 (50)	100 (100)	

In present study we divided patients based on the time of correction of data. In present study majority of the patients were in the age group of 31-40 years (n=36) followed by 21-30 years (n=30). Age distribution was also compared between both the groups we found that Majority of the patients in retrospective group belong to age group of 31-40 years [22 (61.1%)] followed by 21-30 years [(14 (46.7%)] similarly in prospective group majority of the patients were in the age group of 21-30 years [16 (53.3%)] followed by 31-40 years [14 (38.9%)]. The age distribution between both the groups was similar as revealed by the insignificant p value of 0.668.

Table 2: Comparing Conventional system findings between groups

Conventional system	Group		Total	P value
	Retrospective	Prospective		
BENINGN	1 (100)	0 (0)	1 (100)	<0.001
THYROID NEOPLASM	0 (0)	1 (100)	1 (100)	
ADENOMATOUS HYPERPLASIA	0 (0)	1 (100)	1 (100)	
BENIGN	36 (100)	0 (0)	36 (100)	
BENIGN THYROID LESION	0 (0)	2 (100)	2 (100)	
BENINGN COLLOID CYST	0 (0)	1 (100)	1 (100)	
BENINGN CYSTIC LESION OF THYROID	0 (0)	1 (100)	1 (100)	
BENINGN FOLLICULAR LESION	0 (0)	2 (100)	2 (100)	
BENINGN NEOPLASM	0 (0)	1 (100)	1 (100)	
BENINGN THYROID LESION	0 (0)	6 (100)	6 (100)	
COLLOID CYST	0 (0)	1 (100)	1 (100)	
COLLOID GOITRE	0 (0)	7 (100)	7 (100)	
COLLOID LESION	0 (0)	1 (100)	1 (100)	
CYSTIC CHANGES WITH NODULAR GOITRE	0 (0)	1 (100)	1 (100)	
CYSTIC DEGENERATION	0 (0)	3 (100)	3 (100)	
CYSTICALLY DEGENERATED LESION	0 (0)	1 (100)	1 (100)	
EQUIVOCAL	2 (100)	0 (0)	2 (100)	
FOLLICULAR HYPERPLASIA	0 (0)	1 (100)	1 (100)	
FOLLICULAR NEOPLASIA	5 (100)	0 (0)	5 (100)	
FOLLICULAR NEOPLASM	0 (0)	2 (100)	2 (100)	
GOITRE CYSTIC CHANGES	0 (0)	1 (100)	1 (100)	
GRANULOMATOUS THYROIDITIS	0 (0)	1 (100)	1 (100)	
GRAVES DISEASE	0 (0)	1 (100)	1 (100)	
HAEMORHAGIC CYST	0 (0)	1 (100)	1 (100)	
HASHIMOTO THYROIDITIS	0 (0)	2 (100)	2 (100)	
HURTHLE CELL ADENOMA	0 (0)	1 (100)	1 (100)	
INADEQUATE	4 (100)	0 (0)	4 (100)	
LYMPHOCYTIC THYROIDITIS	0 (0)	1 (100)	1 (100)	
MALIGNANCY	2 (100)	0 (0)	2 (100)	
NODULAR GOITRE	0 (0)	1 (100)	1 (100)	
NODULAR HYPERPLASIA	0 (0)	1 (100)	1 (100)	
THYROID LESION WITH CYSTIC DEGENERATION	0 (0)	1 (100)	1 (100)	
THYROID WITH CYSTIC DEGENERATION	0 (0)	1 (100)	1 (100)	
THYROIDITIS	0 (0)	3 (100)	3 (100)	
UNSATISFACTORY	0 (0)	3(100)	3 (100)	

On analysis of findings of conventional system we found that majority of the patients in Retrospective group had BENIGN lesion (n=36) followed by FOLLICULAR NEOPLASIA in 5 and EQUIVOCAL in 2 whereas in Prospetcive group BENINGN THYROID LESION was seen in 6 patients, COLLOID GOITRE in 7 patients, CYSTIC DEGENERATION, THYROIDITIS in 3 patients each, BENIGN THYROID LESION in2,

BENINGN FOLLICULAR LESION in 2 and HASHIMOTO THYROIDITIS in 2 patients. In prospective group 3 patients showed UNSATISFACTORY responses.. In prospective group none of the patients had INADEQUATE findings whereas in retrospective group 4 patients showed INADEQUATE diagnosis using conventional system.

Table 3: Comparing Bethesda System between groups

Bethesda System	Group		Total	P value
	Retrospective	Prospective		
ATYPIA OF UNDETERMINED SIGNIFICANCE	4 (40)	6 (60)	10 (100)	0.657
BENIGN LESION	41 (50.6)	40 (49.4)	81 (100)	
FOLLICULAR NEOPLASM	3 (75)	1 (25)	4 (100)	
MALIGNANT	2 (40)	3 (60)	5 (100)	
Total	50 (50)	50 (50)	100 (100)	

In Bethesda System None of the patients in both the group showed INADEQUATE diagnosis which was seen in the retrospective group using conventional system. Bethesda System has revealed that out of 81 patients with BENIGN LESION, 41 (50.6%) were in retrospective group and 40 (49.4%) were in prospective group. MALIGNANT was present in 2 (40%) and 3 (60%) patients in Retrospective and prospective group. Similarly out of 4 patients with FOLLICULAR NEOPLASM, 3 (75%) and 1 (25%) were in retrospective and prospective group. However the distribution was comparable between both the groups.

Discussion

The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) was came out of National Cancer Institute State of Science Conference in 2007 on thyroid FNA, it defines the consensus diagnostic terminology and morphologic criteria. [3]

In present study we divided patients based on the time of correction of data. In present study majority of the patients were in the age group of 31-40 years (n=36) followed by 21-30 years (n=30)[5]. Age distribution was also compared between both the groups we found that Majority of the patients in retrospective group belong to age group of 31-40 years [22 (61.1%)] followed by 21-30 years [(14 (46.7%)] similarly in prospective group majority of the patients were in the age group of 21-30 years [16 (53.3%)] followed by 31-40 years [14 (38.9%)][6]. The age distribution between both the groups was similar as revealed by the insignificant p value of 0.668. In the study of Gharia AA[5] et al the maximum incidence of thyroid lesions, are between the ages of 21 - 30 years, i.e. 48 cases (24%). There was no case reported in the 0 – 10 year age group and >80 years of age. In the study of Gupta et al, the age group was 22 – 58 years and the median age was 38.72 years[7,8].

Conclusion

Adapting the Bethesda system of reporting has led to a high to sensitivity, specificity and high negative predictive values. Use of Bethesda systems helps in the prognosis, management and minimizes the unnecessary surgical procedures of thyroid swelling.

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