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Original Research Article

Evaluation of thyroid nodule in pediatric population in a tertiary care hospital

Mukul Singh, Manju Kumari*

Department of Pathology, Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India

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***Correspondence:**
Dr. Manju Kumari,
E-mail: manju.yadav126@gmail.com

ABSTRACT

Background: Thyroid nodules are commonly present in adult population but are rare in pediatric age group. Inspite of being rare, thyroid nodule have a higher chance of malignancy in children. Thus, pediatric patients presenting with thyroid nodule found clinically or incidentally should be worked up to rule out any possibility of malignancy. The besthesda system for reporting thyroid cytopathology (TBSRTC) is widely used for reporting in adults. The present study aims to use TBSRTC for pediatric thyroid lesions reporting.
Methods: All pediatric patients with age ≤ 18 years presenting with thyroid nodule during January 2018 to April 2019 were included in the study, fine needle aspiration (FNA) was done and findings were compared with histology. Statistical analysis was done using SPSS version 18.
Results: 42 pediatric patient were included in the study, out of which 2.38% were malignant and suspicious for nmalignant each and 83% were benign.
Conclusion: TBSRTC is quite sensitive and specific reporting guideline in pediatric population as in adult population with 100% accuracy in diagnosing benign and malignant cases. This is useful for avoiding unnecessary surgeries.

Keywords: Cytopathology, Malignancy, Pediatric, The besthesda system for reporting thyroid cytopathology, Thyroid nodule

INTRODUCTION

Thyroid nodule in pediatric population is a rare occurrence with an incidence of 0.05 %-1.8 % whereas it is 3.2 to 8% in adult population.[1,2] Despite of being rare the chances of malignancy are very high (22-26 %) in these patients as compared to adults(5-14 %).[3,4] Although the palpable thyroid nodules are less the incidentally found thyroid lesions on ultrasonography are high with an incidence of 18 to 58 %.[5]

Fine needle aspiration cytology (FNAC) is a quick, effective and an outdoor patient department (OPD) procedure for thyroid lesions in adults which has dramatically reduced the thyroid surgeries. The rate of malignancy has increased from 14% to 58% due to selective surgeries done for thyroid lesions.[6] The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) is the most accurate method for thyroid reporting suggested by American thyroid association.[7]

However, the role of FNAC in pediatric age group is limited and a very few studies have evaluated the role of TBSRTC in pediatric patients. The present study enlightens the role of FNAC and TBSRTC reporting in pediatric patients decreasing the rates of thyroid surgeries in benign lesions.

METHODS

The study was conducted from January 2018 to April 2019 and included 42 pediatric patients of age less than 18 years. All the patients reffered to department of cytopathology for FNAC with age ≤18 years were included in the study. A detailed history including duration of nodule, symptoms of hypothyroidism or hyperthyroidism, sudden/ insidious onset, size of lesion, solid/cystic areas present/absent and family history was taken. Local examination to assess the size, consistency, extension and movement of swelling with deglutination was noted. FNAC was done by using 26G needle attached to 10 ml syringe without a syringe holder. Smears were air dried for May-Grünwald-Giemsa (MGG) stain and immediately alcohol (95% Ethnol) fixed for Papanicoalaou (PAP) stain. Smears were examined by experienced cytopathologist and reported according to TBSRTC. The statistical analysis was done by SPSS version 18.

The TBSRTC has six categories as follows:

1. Nondiagnostic.
2. Benign.
3. Atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS).
4. Suspicious for follicular neoplasm (SFN).
5. Suspicious for malignancy (SM).
6. Malignancy.

RESULTS

A total of 42 pediatric cases were received in 15 months of time period.

Table 1. Distribution of cases according to the bethesda system of reporting of thyroid cytology.

Bethesda category	Pediatric cases no. (%)
Total cases	42 (100%)
I, Unsatisfactory	05 (11.90%)
II, Benign	35 (83.33%)
Colloid goiter	23 (54.76%)
Lymphocytic thyroiditis	08 (19.04%)
Hashimotos thyroiditis	03 (07.14%)
Graves disease	01 (02.38%)
Adenoid goiter	00 (00.00%)
III, AUS/FLUS	00 (00.00%)
IV, SFN	00 (00.00%)
V, SM	01 (02.38%)
VI, Malignancy	01 (02.38%)
Pappilary	01 (02.38%)
Medullary	00 (00.00%)
Follicular	00 (00.00%)
Anaplastic	00 (00.00%)

AUS/FLUS-Atypia of undetermined significance/follicular lesion of undetermined significance.

Of the 42 cases (10 males and 32 females), one case (02.38%) was of papillary carcinoma, one (02.38%) was suspicious for malignancy, 35 cases (83.33%) were benign and 05 cases (11.90%) were unsatisfactory. The 35 benign cases included 23 colloid goiter, 08 lymphocytic thyroiditis, 03 hashimotos thyroiditis and one case of graves' disease (Table 1).

Among the 42 pediatric cases histological correlation was done in five cases only as most of the benign cases were managed non surgically. Three cases operated were of benign category one colloid goiter and two were lymphocytic thyroiditis. All these three cases were having 100 % accuracy on FNAC. The case suspicious for malignancy was found to be malignant (papillary carcinoma) on histopathology whereas the one case reported as papillary carcinoma was consistent with papillary carcinoma.

DISCUSSION

Thyroid carcinomas are on a rise in both the adults and pediatric population. Pediatric thyroid nodules are less encountered in comparision of the adult population. But whenever found these have higher chances of being malignant.[8,9] FNAC with six tier system is widely used but is used in pediatric cases by only few studies.[3,10-12] The present study utilized TBSRCT in pediatric patients and evaluated that it can be used in children as effectively as in adults. The incidence of malignant and suspicious for malignancy category on cytology were 2.4 % each in this study. The rate of malignancy on resected cases was 20 % which is similar to other studies in literature.[13,14]

Out of 42 cases only five underwent surgical resection. This reflects the decreased burden on surgeons by avoiding unnecessary surgeries in benign cases. Also thyroid surgeries in pediatric patients have higher chances of complications as compared to adults. Among these five, two were lymphocytic thyroiditis (Figure 1), one was colloid goiter (Figure 2), one was papillary carcinoma (Figure 3) and one was suspicious for neoplasm. Cases reported as benign on cytology were benign and malignant were malignant respectively on histology resection showing 100% sensitivity and specificity of TBSRCT in pediatric population.

The intermediate category comprising of AUS/FLUS, SFN,SM are the most difficult ones as the maximum number of malignancies are detected in these groups in children. In the present study the case which was suspicious for malignancy on cytology was found to be malignant(papillary carcinoma on histology. This can also be explained as the cytpathologist are overcautious not to overdiagnose the lesions in pediatric patients.

Around about 12% were unsatisfactory for diagnosis either due to low cellularity as the pediatric patients are not so cooperative or due to poor technique of performing FNAC or staining.

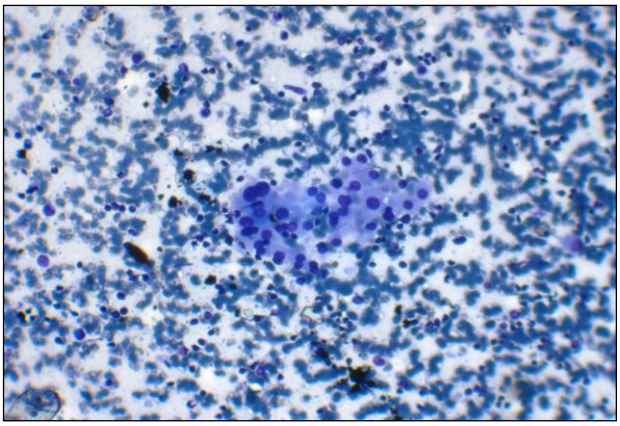

Figure 1: Giemsa 200x, follicular epithelial cells with lymphocytic impingement in lymphocytic thyroiditis.

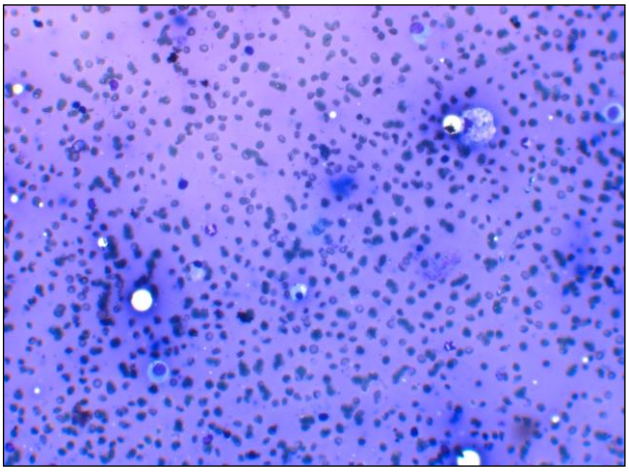

Figure 2: Giemsa 200X, colloid goiter with background thin colloid and scattered cystic macrophages.

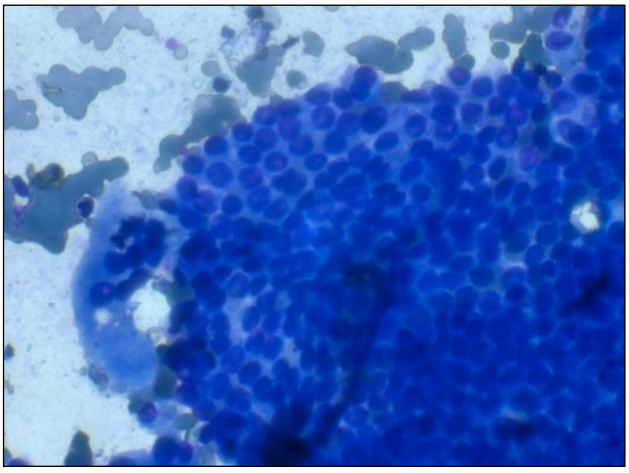

Figure 3: Giemsa 400x, Pappillary carcinoma thyroid with anatomical borders and nuclear inclusions.

The present study showed papillary carcinoma is the most common thyroid malignancy in pediatric age group.

CONCLUSION

Pediatric thyroid malignancy rates are higher than adults. Thus a reproducible reporting system like TBSRCT is the required for sorting the cases as benign of malignant on cytology so that further effective management could be planned whether medical / surgical. The six tier system is effective in sorting patients. The utility of this system has highly reduced the unnecessary surgeries in pediatric patients leading to proper management of larger number of patients.

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