



ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF HEAD AND NECK MASSES IN ADOLESCENT AGE GROUP IN RIMS RANCHI

Dr. Pearl Esther Minz*

Junior Resident, RIMS, Ranchi, Jharkhand. *Corresponding Author

Dr. Lalita Khess

Associate Professor, RIMS, Ranchi, Jharkhand

ABSTRACT

Adolescence is a phase of life that is exposed to various factors which includes infectious and carcinogenic agents. It is a rapid phase of human development and an effect of these threats have an impact in the later years of life. FNAC being an easy and cost effective tool can be used to diagnose and screen the masses of diverse tissue origin in the head and neck area in this age group.

The aim of this study is to find the nature of the lesion, inflammatory or Neoplastic, if neoplasm, whether benign or malignant and their specific diagnosis. A total of 50 cases were taken in the study they were between 10 to 19 years (adolescent) with head and neck masses, 52% were females and 48% were males. Out of the total 98% were benign and only 2% were malignant.

KEYWORDS : FNAC, Head, neck, masses Adolescent, Age Group

INTRODUCTION

"Adolescence" a transitional phase of growth and development between childhood and adulthood. The WHO defines an adolescent as a person between ages 10-19.^[1]

The importance of the health of adolescents has started to receive increasing recognition particularly in developing countries where 4 out of 5 of the world's young people live, and where half of the population is under the age of 25. The development that takes place in adolescence is uneven in that the physical maturity will be achieved in advance of the psychological maturity.^[2]

The youth of today are exposed to various factors like infectious agents, some capable of causing neoplasm both benign and malignant. The agents include the, Human Papilloma Virus, Epstein bar virus, Human immunodeficiency virus.^[3]

This group of people have a maximum exposure to carcinogenic pollutants, ionizing radiations, electromagnetic fields by the use of computers and mobiles effect of UV-rays, the use of tobacco, beetle quid, gutka, alcohol, intoxicants, drugs, change in dietary habits, impact on the health of adolescents.^[4]

Adolescents experience the onset of puberty and development of secondary sex characters. This phase is one of the most rapid phases of human development. The changes in adolescents have health consequences, not only during this time but over the life course.

Adolescence is the foundation of the future health.

FNAC became accepted and integrated in the diagnostic routines by the team of pathologists and clinicians. In the following years, experience accumulated rapidly and pathologist and oncologist from many other countries came to study the technique, this subsequently spread to the rest of Europe, America, Asia, and Australia. FNAC is now a part of the service in the department of Pathology.

Head And Neck Masses

The proximity of tissues of various types and wide range of primary and metastatic neoplasm are responsible for this site. The site being among the most interesting and challenging in FNAC diagnosis. FNAC a minimally invasive technique is particularly suitable in this sensitive area where an incision biopsy can cause problem.^{[5][6]}

Approximately, 50,000 new cases of head and neck cancers are diagnosed worldwide annually.

The head and neck area consists of various masses which could be congenital, such as Thyroglossal duct / cyst, Branchial cleft cysts/ sinus, vascular anomalies. It could be inflammatory masses, such as reactive lymphadenopathy granulomatous lesions, and also Neoplastic masses both benign and malignant.

The mass can be from different sites of the head and neck, scalp, eyelids pinna of the ear, nose, oral cavity, nasal sinuses, floor of the mouth, tongue, palate, tonsils nasopharynx, Pharynx, a variety of orbital, intraocular tumours, thyroid and lymph nodes, soft tissue, bone, salivary glands.^[7]

In the workup of the superficial neck masses the first important step is to construct a differential diagnosis derived from the relevant findings from clinical history and physical examination.^{[8][9]}

An increasing incidences of head and neck neoplasm among young adults has been reported.^[10]

Adolescent head and neck lesions vary from country to country and region the study is taken to review the Cytomorphological spectrum of the age group with respect to Sex, and site of involvement in the head and neck region.^{[11][12]}

Material And Methods

A total number of 50 cases were studied from Aug 2019 to July 2020. The study was performed on OPD patients of Rajendra Institute of Medical Science, Ranchi. FNAC was done in all the adolescent patients with palpable head and neck masses.

Place Of Work:

Department of Pathology, Rajendra Institute of Medical Science, Ranchi, Jharkhand.

Study Population:

Patient between the age of 10-19 years coming to the Department of Pathology, RIMS for 8 months period depending upon inclusion and exclusion criteria.

Design Of Study: Cross-sectional.

Duration Of Study: 12 months

Literature Review: 1 month

Data collection, data entry and analysis: 8 months

Report Writing: 3 months

Sample Size: A minimum of 50 cases of head and neck masses in adolescent age group (10-19 years) were studied.

Sampling: Consecutive

Inclusion Criteria:-

Patients of 10 to 19 years of age (adolescents) with palpable head and neck masses.

Exclusion Criteria:-

1. Patients who are previously diagnosed cases, receiving therapy.
2. Patients not willing to participate in the study/ refuse.
3. Reoccurrence of the lesion.

Methods

Patient Preparation

The FNAC procedures were clearly explained to the patients guardian to assure them and for their co-operation. A formal written consent was taken. The procedure was carried out with the patient in easily accessible position.

Procedure of Aspiration

The standard technique was applied using 22 gauge needle attached to 10ml disposable syringe. The area was cleaned with antiseptic; the needle inserted along with the syringe several to and fro movements were made and the needle withdrawn.

Slide Preparation

At least six smears were made from the aspirated material. Two of these were immediately fixed in 95% ethanol for 15 minutes and stained by

routine Haematoxylin and Eosin (H&E) stain.

Fixation and staining

In our study we used

- 1) Haematoxylin and Eosin (H&E) stain for ethanol fixed slides.
- 2) Leishman Giemsa (LG) stain for dry smears

Observation And Results

A total of 50 cases of adolescent age group [10- 19 years] were taken in our study. The patients presented with the head and neck masses. FNAC was performed in all the cases.

Table 1: Showing The Different Age Group With No Of Cases And Percentage

AGE GROUP	NO. OF CASES	PERCENTAGE
10-14 YEARS	16	32%
15- 19 YEARS	34	68%

The study group, 50 cases of adolescents who underwent FNAC was divided into 2 age groups, between 10-14 years and 15 to 19 years. There were 34 (68%) cases in the age group 10 to 14 years and 16 (32%) in the age group 15 to 19.

Table 2: Statistics Age (years)

Number	50
Mean	15.78
Median	15
Mode	16 & 18
Standard Deviation	3.286

Minimum	10
Maximum	19

The total number of cases was 50. The Mean age group being 15.78. The Median age was 15. The Mode, the most recurrently occurring age group was both 16 & 18. The Standard Deviation is 3.286. The minimum age group in the study was 10 and the maximum age group was 19.

Table 3 Showing Gender Distributions

GENDER	NO OF CASES	PERCENTAGE
MALE	24	48%
FEMALE	26	52%

Table showing distribution of gender in head and neck masses.

Figure 1: Bar Graph Showing Diagnosis Of Head And Neck Masses

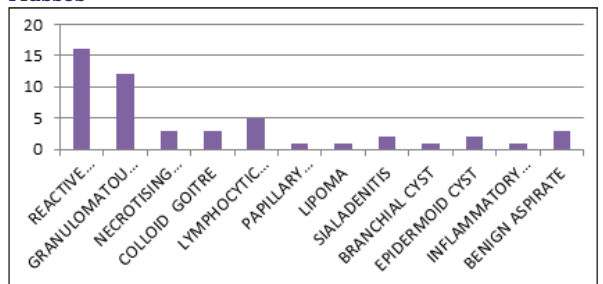


Table 4: Tissues Of Origin

TISSUES	NO OF CASES	PERCENTAGE
LYMPH NODE	31	62%
THYROID	9	18%
SALIVARY GLANDS	2	4%
CONGENITAL LESIONS	1	2%
OTHERS	7	14%
TOTAL- 50		100%

Table showing tissues of origin of the various head and neck masses in the study population of 50 cases of adolescent people.

Table 5: Distributions Of Head And Neckmasses In 10-14 Years Of Age.

AGE GROUP	FNAC DIAGNOSIS	NO.OF CASES	INFLAMMATORY	NEOPLASTIC	OTHERS
10- 14 YEARS	REACTIVE LYMPHADENITIS	9[18%]	12 (24%) of the total cases	BENIGN	ANT
	GRANULOMATOUS LYMPHADENITIS	1[2%]		1	1
	NECROTISING LYMPHADENITIS	0[0%]		2 (4%) Of the total cases	
	COLLOID GOITRE	0[0%]			
	LYMPHOCYTIC THYROIDITIS	1[2%]			
	PAPILLARY CARCINOMA	1[2%]			
	LIPOMA	0[0%]			
	SIALADENITIS	0[0%]			
	BRANCHIAL CYST	1[2%]			
	EPIDERMOID CYST	1[2%]			
	INFLAMMATORY LESION	1[2%]			
	BENIGN ASPIRATE	1[2%]			
	TOTAL CASES	16 (32%) Of total cases			2 (4%) of total cases

Table 6: Distributions Of Head And Neck Masses In 15-19 Years Of Age

AGE GROUP	FNAC DIAGNOSIS	NO.OF CASES	INFLAMMATORY	NEOPLASTIC	OTHERS	
15 - 19 YEARS	REACTIVE LYMPHADENITIS	7[14%]	27 (54%) of total cases	BENIGN	2 (4%) of total cases	
	GRANULOMATOUS LYMPHADENITIS	11[22%]		MALIGNANT		
	NECROTISING LYMPHADENITIS	3[6%]		5		0
	COLLOID GOITRE	3[6%]		5 (10%) Of total cases		
	LYMPHOCYTIC THYROIDITIS	4[8%]				
	PAPILLARY CARCINOMA	0[0%]				
	LIPOMA	1[2%]				
	SIALADENITIS	2[4%]				
	BRANCHIAL CYST	0[0%]				
	EPIDERMOID CYST	1[2%]				
	INFLAMMATORY LESION	0[0%]				
	BENIGN ASPIRATE	2[4%]				
TOTAL CASES	34 (68%) Of total cases					

DISCUSSION

A total of 50 cases were taken in our study. All cases were adolescents between the age group of 10 to 19 years. The Mean age of the study population was 15.78. The Standard Deviation of age group in our study was 3.286. The study population was divided into two groups; 10-14 years consisting of 16 cases (32%), 15-19 years consisting of 34 cases (68%). Among our study population 26 (52%) were males and 24 (48%) were females. The male and female ratio is 13:12

In a similar study Alqudeh Z et al [13] found the mean of the age group was 16.48 which differs in our study being 15.78. In his study there was a female predominance 56% and male 44% were as in our study predominance was of males Rapkiewicz A, et al [11] al found the mean age to be 9 years with a study population age being 4 months to 18 years. There was a male predominance (n=59) consistent with our study.

Disease Distribution

In our study of 50 cases studied in the head and neck area the tissues of origin were lymph node 31 cases (62%), Thyroid 9 cases (18%), Salivary glands 2(4%), congenital lesions 1 case (2%), others (7%).

In the study by Alqudeh Z , et al [13] in 26 adolescent patients the tissues of origin with the exclusion of Thyroid was as follows ,lymph node 18 cases, salivary gland 5 cases and miscellaneous origin 3 cases. The cases from the thyroid were not included in the study the maximum number of cases was from the lymph nodes which is consistent with our study.

Rapkiewicz A, et al [11] was also consistent with our study with 91% cases originating from the lymph nodes.

Mittra P et al [14] study included age group 0 to 15 years and the tissues of origin was as follows lymph nodes 81%, skin and subcutaneous tissue 3.2%, thyroid 4.3%, and salivary glands. There is a wide variation in the thyroid lesion as in our study

the thyroid origin cases are 18 %.The reason could be the inclusion of higher age group in our studies 10 to 19 years where the thyroid lesions are more common Out of the 50 cases, in the study population. The diagnosis of the FNAC was as follows:-

Reactive lymphadenitis 16 cases (32%) ,granulomatous lymphadenitis 12 cases (24%), necrotising lymphadenitis 3 cases (6%), colloid goitre 3 cases (6%), lymphocytic thyroiditis 5 cases (10%), Papillary carcinoma 1 case (2%), Lipoma 1 case (2%), sialadenitis 2 cases (4%), branchial cyst 1 case (2%), epidermoid cyst 2 cases (4%), inflammatory lesion 1 case (2%), benign aspirate 3 (6%).

Mittra P et al [14] study conducted in 81 patients showed Reactive Lymphadenitis in 31 patients, Granulomatous Lymphadenitis in 23 patients, Necrotising Lymphadenitis in 17 patients, Lymphocytic thyroiditis in 1 patient, Papillary Carcinoma of Thyroid in 1 patient, others (Cases which are not found in our study) 8 cases.

The above study was consistent with our study in Reactive Lymphadenitis, Granulomatous Lymphadenitis, and Papillary Carcinoma.

Rapackwiz A et al [24] study showed Reactive Lymphadenitis in 66%,Granulomatous Lymphadenitis in 15%, Necrotising Lymphadenitis in 10.1% In our study Granulomatous Lymphadenitis cases show a higher percentage that is 24% in comparison with Rapackwiz A et al. M Jain et al [12] study showed Reactive lymphadenitis in 60.6%,Granulomatous Lymphadenitis in 30.5% and Necrotising Lymphadenitis in 7.1%. The thyroid cases were 2.1 % with colloid goitre (12 case), thyroglossal cyst in in 11 cases and thyroid cyst in 1 case, In our study the thyroid cases were 9 (18%) The colloid goitre is 3 case (6%),lymphocytic thyroiditis in 5 cases (10%), papillary carcinoma in 1 case(2%). There is a variation in our study. Mittra P et al [14] study showed thyroid lesions 4.3% of the total cases with 1 case of lymphocytic thyroiditis, 1 case of lingual thyroid, 1 case of thyroglossal cyst and one case of papillary carcinoma. In our the study no cases of thyroglossal cyst or lingual thyroid were found. There were 5 cases of lymphocytic thyroiditis and 3 cases of colloid goitre . Jain M at al [12] study showed 15 cases (2.1%) of salivary gland lesions with chronic sialadenitis 4 cases, mucus retention cyst 6 cases, pleomorphic adenoma 3 cases, acute abscess 1 case, and normal in 1 case.

Mittra P et al [14] study in 100 cases showed salivary gland lesions of 1%, with only 1 case of pleomorphic adenoma. There were 2 cases of epidermoid cyst.

Our study shows 2 cases (4%) of salivary gland lesions and all the cases are of sialadenitis. and 1 case of epidermoid cyst. The other lesions Lipoma, branchial cyst, inflammatory lesion, benign aspirate are not documented in the above studies.

Rapackwiz A , et al [11] study showed benign lesions to be 83% and malignant to be 17%.Jain M et al [12] study showed benign lesions to be 98.46 % and malignant to be 1.54%.Mittra P et al [14] study showed benign lesions to be 88.17 % and malignant to be 11.83%.Our study shows benign lesions to be 98 % and malignant to be 2%.

Comparission Between The To Age Groups

Our study population [10 -19 years] was divided into two age groups

First being 10 – 14 years and **second** 15 to 19. 14.5 years was considered as 14 years and above 14.5 years was considered as 15 years. Maximum number of cases was seen in age group

15 to 19 years. Reactive Lymphadenitis was 9 (18%) in the first age group and 7 (14%) in the second age group.

In comparison, the granulomatous lymphadenitis was 1(2%) in the first age group and 11(22%) in the second age group with a vast difference.

The total number of inflammatory lesion in the first age group being 12(24%) and the second age group being 27(54%) Total number of Neoplastic lesion is 2(4%) in the first age group out of which 1 (2%) was benign and 1 (2%) was malignant.

Total number of Neoplastic lesions is 5(10%) in the second age group out of which all are benign.

The other lesions including the congenital, and benign aspirates were 2(4%) in the first as well as second age groups.

Summary

A total of 50 cases of adolescents between the age group 10 to 19 years with head and neck masses were taken into the study.

Among the study population 26[52%] of cases were females and 24[48%] were males with a male to female ratio of 13: 12.

Among the cases the maximum number of cases were benign 49 [98%] and 1[2%] were malignant.

Among the benign lesions reactive lymphadenitis leads the list followed by granulomatous lymphadenitis which is more common in the age group 15-19 years.

The single malignant lesion is the papillary carcinoma of thyroid.

CONCLUSION

Our study "Role of fine needle aspiration cytology in the diagnosis of head and neck masses in adolescent age group in RIMS, Ranchi" A total of 50 cases were taken between 10-19 years (adolescent) with head and neck masses, FNAC was done.

The most common lesions were benign (inflammatory, congenital). Only 1 malignant case was seen. Majority of the cases were seen in 15-19 years.

REFERENCE

1. "Youth and health risks" WHO sixty four world health Assembly Resolution, Geneva, 2011, W.N.A 64. 28.
2. Park K, Park text book of preventive and social medicine.
3. D' souze G, Krimer AR, Viscidi R, Pawlita M Fakhru, Koch WM, et al, case control study of human Papilloma virus in oropharyngeal carcinoma
4. Langeraman A, Journal 2004 & P-4
5. Orell SR, Sterett GF, "Orell and Sterett's fine needle aspiration cytology, 5th edition Australia 2012 churchill Living stone as imprint of Elsevier Limited.
6. Ferly J, Shin HR., Bray F Formand, Matherse, Parkin DM, Globocan 2008, VL;-2 "Cancer incidence and Mortality world wide", Lyon France International quench for research on cancer.
7. Oliai BR, Sheth S, Burroughs FH, Ali 52 " Parapharyngeal space tumours". A cytopathological study of 24 cases on Fine needle. Diagnosis cytopathol 2005; 32:115.
8. Meuwly JY, Leporid, Theumann N, et al multimodality Imaging evaluation of paediatric Neck. Techniques and Spectrum of Findings, Radio Graphics 2005; 25 (7) 931-948
9. Oates CP, Wilson AW, Ward Booth RP Williams CD, Combined use of Doppler, a convention ultrasound for the diagnosis of vascular and other lesions in head and neck.
10. Liewhellyn CD, Johngon NW, Wamakula Supriya KA, "Risk Factors for Squamous cell carcinoma of oral cavity in young people, a comprehensive literature review, oral onco /2001 37 p 401 -18
11. Rapkiewicz A, Thuy Le B, Samshir A, Cangiarella J Levine P, Spectrum of head and neck lesions diagnosed. By FNAC in Paediatric Population 2007; 111; 242-5 [PUBMED]
12. Jain M, Majumdar DD, Agarwal Bais AS, Chaudhary M. FNAC as a diagnostic tool in paediatric Head and Necks lesions . Indian Journal of Paediatrics 199; 36; 921-2 [PUBMED]
13. AlquedhyZ, Al- Khars Z. "The role of fine needle aspiration cytology in paediatric head and neck masses: does the yeild justify the pain . Egypt J Oto laryngol 2014;132-7.
14. Mitra P, Bharti R, Pandey M. "Role of fine needle aspiration cytology in head and neck lesion in paediatric age group" . June 2013 . Journal of clinical and diagnostic research 7(6):1055-87