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Original Research Article

Cytology of Paediatric lesions: a tertiary care centre experience during COVID-19

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ABSTRACT

Background: Paediatric lesions are worrisome and need immediate attention with early diagnosis. Fine needle aspiration cytology (FNAC) is safe, cost effective, minimally invasive method which helps in diagnosis and guides for treatment of various paediatric lesions.
Methods: This was an observational study done during the pandemic of COVID-19 at department of pathology in Andhra Medical College, Visakhapatnam from March 2020 to October 2020 .The total number of cases were 91 who underwent fine needle aspiration (FNA) during this period. USG guided aspiration and fluids are also included in the study. Slides were fixed in 95% isopropyl alcohol and stained with Haematoxylin and Eosin. May Grunwald Giemsa stain, CBNAAT for acid fast bacilli and correlation with histopathology was done wherever required and results were tabulated.
Results: In the present study the lesions were more common in female children (68.13%) and in the age group of 11-15 years (35.16%).Benign lesions (80.91%) were more common than malignant lesions. Majority of benign lesions were reactive lymphadenitis (32.5%) followed by tuberculous lymphadenitis (23.75%). The common malignant lesions were lymphoblastic and Hodgkin's lymphoma, metastatic nasopharyngeal carcinoma, malignant peripheral nerve sheath tumour (MPNST), Langerhans cell Histiocytosis and Ewing's sarcoma.
Conclusions: Extra pulmonary tuberculosis in children is highly variable in severity and rate of progression with long term sequelae. The spectrum of malignancies in children is variable and region based. FNAC helped in early diagnosis and management of these cases.

Keywords: Malignancy, Paediatric lesions, Extrapulmonary tuberculosis, FNAC

INTRODUCTION

Paediatric lesions are worrisome and need early diagnosis. During pandemic of COVID-19 with availability of less investigative methods, FNAC played a great role in the diagnosis and instituting early therapy. FNA also helps in confirmatory diagnosis of extrapulmonary tuberculosis (EPTB) by CBNAAT and in therapy for simultaneous drug sensitivity testing. FNA avoids unnecessary excision biopsy in reactive lesions.[1] The objective of present study was to utilise FNAC as firstline investigation for diagnosis of paediatric lesions.

METHODS

This is a hospital based observational study done during the pandemic of COVID-19 at Department of Pathology, Andhra Medical College, Visakhapatnam. The period of

study was from March 2020 to October 2020. The total number of cases were 91 who underwent FNA during this period. The cases included in the study were children less than 18 years of age of both sexes with superficial and internal lesions, unstained smears received by USG guided aspiration, fluid received for cytological examination. Inadequate aspiration, and cases on therapy were excluded in the study.

Prior written informed consent for aspiration was obtained from a parent of all children. Under aspetic precautions, aspiration was done and two slides were made with aspirate in all cases. One slide was wet fixed in 95% isopropyl alcohol and stained with Haematoxylin and Eosin. Other slide was air dried and stained with May Grunwald Giemsa stain. Cases with lesions of size less than 1cm and cases with unsatisfactory aspirate were sent for ultrasound guided aspiration. Aspirate of cases with clinical suspicion of tuberculosis was sent for CBNAAT. Histopathological examination was done in all cases except for infectious etiology. The data was recorded in Microsoft office excel sheet. The percentage distribution is calculated.

RESULTS

In present study, paediatric lesions are more common in female children (68.13%) than male children and in the age group of 11-15 years (35.16%) (Table 1, 2). The common lesions were aspirates from lymph nodes in both males and females (62.63%) followed by breast (12.08%) and miscellaneous lesions (12.08%). Benign lesions (88%) are more common than malignant lesions (12.08%) (Table 3). Majority of benign lesions of lymph nodes were reactive lymphadenitis (45.61%) followed by caseating tuberculous lymphadenitis (22.80%) (Table 4). FNAC of right cervical lymphnode in an 8 year old child showed epitheloid cells, giant cells, caseous necrosis, lymphocytes and polymorphs suggestive of tuberculous lymphadenitis. CBNAAT of aspirate was positive for mycobacterium tuberculae (Figure 1).

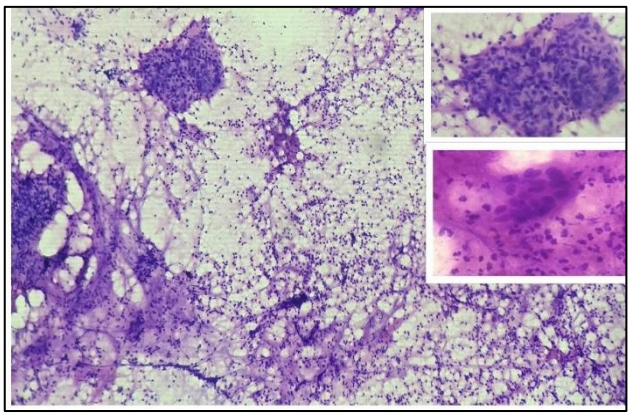

Figure 1: FNAC of right cervical lymphnode in an 8 years old child showed epitheloid cells, giant cells, caseous necrosis, lymphocytes and polymorphs suggestive of tuberculous lymphadentitis. CBNAAT of aspirate was positive for mycobacterium tuberculae.

Table 1: Age distribution of paediatric lesions.

Paediatric lesions	0-5 years	6-10 years	11-15 years	16-18 years	Total cases
Lymphnode	12 (21.05%)	14 (24.56%)	20 (35.08%)	11(19.29%)	57
Miscellaneous	1 (9.09%)	1 (9.09%)	4 (36.36%)	5 (45.45%)	11
Breast	0	0	2 (18.18%)	9 (81.81%)	11
Fluid cytology	2 (28.57%)	1 (14.28%)	2 (28.57%)	2(28.57%)	7
Thyroid	0	0	4 (80%)	1(20%)	5
Total cases	15 (16.48%)	5 (5.49%)	32 (35.16%)	28(30.76%)	91

Table 2: Sex distribution of paediatric lesions.

Paediatric lesions	Male	Female	Male:Female
Lymphnode	18	39	01:02.1
Miscellaneous	6	5	1.2:1
Breast	2	9	01:04.5
Fluids	3	4	01:01.3
Thyroid	0	5	00:05
Total	29	62	01:02.1

Miscellaneous lesions were epidermal cyst, lipoma, lymphatic cyst, ganglion and giant cell tumour. Breast lesions were fibroadenoma, gynecomastia and benign phyllodes tumour. Thyroid lesions were thyroglossal cyst and colloid goitre malignant lesions were common in lymph nodes followed by soft tissues.

Malignancies diagnosed by FNAC were lymphoblastic lymphoma, Hodgkin's lymphoma, metastatic nasopharyngeal carcinoma, MPNST (malignant peripheral nerve sheath tumour), Langerhans cell histiocytosis and Ewing's sarcoma (Table 5).

Table 3: Site wise distribution of paediatric lesions.

Paediatric lesions	Benign lesions	Malignant lesions	Total
Lymphnode	51 (89.4%)	6 (10.5%)	57 (62.63%)
Miscellaneous	7 (63.63%)	4 (36.36%)	11 (12.08%)
Breast	11 (100%)	0	11 (12.08%)
Fluids	6 (85.7%)	1 (14.28%)	7 (7.69%)
Thyroid	5 (100%)	0	5 (5.49%)
Total	80 (87.9%)	11 (12.08%)	91 (100%)

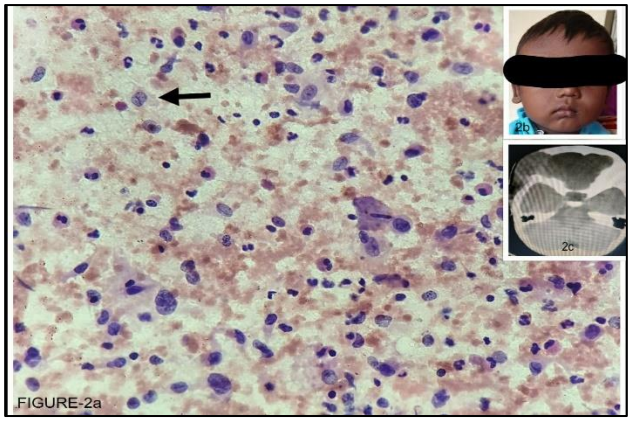

Figure-2: A 2 year old male child presented with right frontal osteolytic lesion. FNAC showed histiocytes with longitudinal nuclear grooves and eosinophils.Histopathological examination of trucut biopsy of lesion suggestive of Langerhan cell histicytosis. Immunohistochemical analysis showed histiocytes positive for CD 1a.

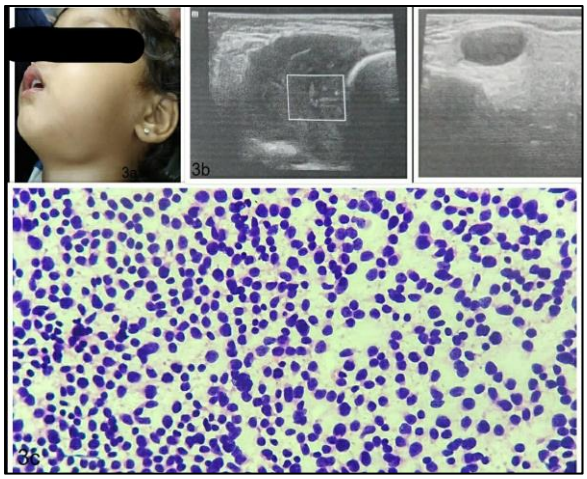

Figure 3: A 3 year old female child with hard swelling over left parotid region of size 3x3 cm and left level 2 cervical lymphadenopathy. FNAC showed hypercellular smears with monotonous population of atypical lymphoid cells. Histopathological examination of lymphnode showed features of Lymphoproliferative disorder. Immunohistochemical analysis showed lymphoblasts positive for CD19, CD20 and Tdt suggestive of B cell lymphoblastic leukemia.

A 2 year old male child presented with right frontal osteolytic lesion was diagnosed with langerhan cell histiocytosis by FNAC (Figure 2).

A 3 year old female child with hard swelling over left parotid region of size 3x3 cm and left level 2 cervical lymphadenopathy was diagnosed with lymphoproliferative disorder by FNAC (Figure 3).

Table 4: Distribution of various lesions of lymphnode.

Distribution of lymphnode lesions	Number of cases
Benign	51 (89.47%)
Reactive lymphadenitis	26 (45.61%)
Tuberculous lymphadenitis	13 (22.80%)
Granulomatous lymphadenitis	6 (10.52%)
Suppurative lymphadenitis	5 (8.77%)
Histiocytic lesion	1 (1.75%)
Malignant	6 (10.5%)
Lymphoproliferative disorder	5 (8.77%)
Metastatic nasopharyngeal carcinoma	1 (1.75%)
Total	57

Table 5: Distribution of other lesions.

Distribution of other lesions	Number of cases
Breast	11 (12.08%)
Fibroadenoma	8 (72.72%)
Phyllodes tumor	1 (9.09%)
Gynecomastia	2 (18.18%)
Thyroid	5 (5.49%)
Thyroglossal cyst	3 (60%)
Colloid goiter	2 (40%)
Miscellaneous (Benign lesions)	7 (7.69%)
Lymphatic cyst	2 (28.57%)
Lipoma	2 (28.57%)
Epidermal cyst	1 (14.28%)
Ganglion	1 (14.28%)
Giant cell tumor of tendon sheath	1 (14.28%)
Miscellaneous (Malignant lesions)	4 (4.39%)
Malignant peripheral nerve sheath tumor	1 (25%)
Langerhan cell Histiocytosis	1 (25%)
Ewings sarcoma	2 (50%)

DISCUSSION

In this study, FNAC was assessed as preliminary diagnostic technique of paediatric lesions and the diagnoses were correlated with histopathology and special stain wherever required.

In the present study, majority of children belong to 11-15 years of age (35.19%) which was correlating with Bhagat et al (59%) and Maheswari et al (40.8%). In the present study, male to female ratio was 1:2.1 whereas in studies of Bhagat et al and Maheshwari et al, male to female ratio was 1.7:1 and 2:1 respectively (Table 6).[2,3] In the present study 88% of lesions were benign and 12% were malignant which was correlating with Sirian et al (87.37%) and Sawaimul et al (95.90%).[4,5] Majority of lesions belong to lymph node in the present study (62.63%) and was correlating with Sawaimul et al (60.7%) and Prathima et al (48.3%).[5,6]

Among the lymph nodal lesions, reactive lymphadenitis were the commonest (45.61%) followed by tuberculous lymphadenitis (22.08%) and granulomatous lymphadenitis (10.52%). Reactive lymphadenitis was the most common lymph node lesion in studies of Bhakta et al (60%) and Prathima et al (44.39%) (Table 7).[4,6]

Table 6: Age and sex distribution of paediatric lesions in comparision with other studies.

Bhagat et al[2]	Maheshwari et al[3]	Present study
11-17 years (59%)	11-14 years (40.8%)	11-15 years (35.16%)
M:F -1.7:1	M:F – 2:1	M: F – 1:2.1

Table 7: Distribution of lymphnode lesions in comparison with other studies.

	Bhagat R et al[1]	Prathima S et al[3]	Sawaimul KD et al[4]	Present study
Site of FNAC	Lymphnode (64.5%)	Lymphnode (48.3%)	Lymphnode (60.7%)	Lymphnode (62.63%)
Reactive lymphadenitis	60%	65.2%	44.39%	45.61%
Granulomatous lymphadenitis	15.5%	10.7%	5.60%	22.80%
Tuberculous lymphadenitis	8.5%	10.1%	6.07%	10.52%
Suppurative lymphadenitis	14%	12.6%	4.67%	8.77%

Bhagat et al reported 43% cases of thyroglossal cyst, 28.6% cases of autoimmune thyroiditis and 14.3% of colloid goitre whereas Prathima et al reported 38.7% colloid goitre, followed by 22.4% cases of lymphocytic thyroiditis and 14.2% cases of thyroglossal duct cyst.[2,6] In the present study, 60% of cases were thyroglossal cyst and 40% cases were colloid goitre. Bhagat et al reported 9 cases of fibroadenoma which was also observed in studies by Sawaimul et al, and Prathima et al.[2,5,6] In the present study, 8 cases of fibro adenoma were reported. Malignant lesions were Lymphomas and Ewing sarcoma in the study by Bhagat et al, Sawaimul K et al diagnosed 6 cases of lymphomas and 1 case of metastatic rhabdomyosarcoma by FNAC.[2,7] In present study, 5 cases of Lymphoma (4 were Lymphoblastic lymphoma, 1 case of Hodgkin lymphoma), Ewing's sarcoma (2), Langerhans cell histiocytosis (1), Malignant peripheral nerve sheath tumour (1), Metastatic nasopharyngeal carcinoma (1) were diagnosed by cytology. Out of 7 fluid samples, 6 were negative for malignancy and 1 was positive for lymphoblastic lymphoma in the present study.

Limitations

limitations of study were small sample size and hospital-based study which cannot represent the community burden of extrapulmonary tuberculosis and malignancy in paediatric population.

CONCLUSION

In the present study it was evident that there was widespread use of FNAC in children with enlarged lymph nodes and differentiating benign from malignant lesions. Most of them were reactive lymph nodes which does not need further investigation. It is also useful and best screening method in the diagnosis of tubercular lymph nodes especially during pandemic of Covid 19 in the underserved. FNAC has helped to avoid unnecessary excision biopsy and its complications.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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