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Clinicopathological Profile Of Significant Cervical Lymphadenopathy In Childern

Pramod Jog[2], Apurva Jonnalagadda[1*] , Sharad Agarkhedkar[1], Y Naga Akhil[3], Sindhuja Reddy[1]

[1]Department of Paediatrics, Dr. D.Y. Patil Medical College, Dr. D.Y. Patil Vidyapeeth (DPU), Pimpri, Pune, Maharashtra, India -18

[2]Professor, Department of paediatrics, IAP president,2016,CHAIR,ACVIP 2015-2017

[3]Department of Orthopaedics, Mediciti Institute Of Medical Sciences, Ghanpur, Medchal, Telangana, India-501401

Abstract

Aim: clinicopathological profile of significant cervical lymphadenopathy in children

Material and methods: This study was retrospective and descriptive. Data has been taken from the case files of all patients seen at the Dr. D. Y. Patil Medical College and Hospital, Pune(2021-2022). The age ranged from 1 month to 12 years.The Health Research and Ethics Committee of the Dr. D. Y. Patil Medical College and Hospital, Pune approved the study and waived the requirement for informed consent.

Results: 50 patients, 72% IP and 28% OP, presenting the symptoms associated with lymphadenopathy were included in this study out of which 62% were male and 38% were female. The median age of presentation was observed to be 6.9 years. Swelling in neck as one of the symptoms was present in majority of patients (90%). Fever (70%), cough (70%), loss of appetite (40%), and sore throat (36%) were the other major symptoms shown by the patients. More than one symptom was shown be 68% of the patients. Majority of cases had lymph node of size 1-2 cm (76%), firm consistency (84%) and mobile (66%). The mot common site of inflammation was anterior cervical (48%) followed by posterior cervical (34%). Tenderness of lymph node was absent in 79% of the cases. Associated findings included tonsillitis (24%), ear infection (16%), hepato/spleenomegaly (16), orodental infection (6%), skin lesion and rash (4% each). Blood counts evaluation showed neutrophilia in majority of cases (56%), followed by leucocytosis (52%), anaemia (32%), lymphocytosis (24%) and eosinophilia (8%). ESR was normal in 64% of the cases. Throat culture resulted in 50% of cases showing normal commensals while as *streptococcus* and *staphylococcus* was found in 33% and 16% of cases respectively. Cytological examination revealed reactive lymphadenitis in 46% cases, tubercular lymphadenitis in 32% cases and Suppurative lymphadenitis in 12% cases. However, 4% cases yielded inadequate aspirate. Mantoux test was negative in 66% of the cases. A total of 23 patients were sent for X-ray, out of which 12 (24%) showed normal X-ray findings.

Conclusion: The above results present the repertoire of evaluations with respect to the detection of lymphadenopathy in children. This study also emphasises the importance of considering various strategies in proper and early detection to ensure timely management of lymphadenopathy.

Keywords: lymphadenopathy, cytology, lymph nodes.

Introduction

An abnormality in the size or nature of lymph nodes is referred to as lymphadenopathy[1]. If a lymph longest diameter in the cervical area is greater than 10 mm, it is regarded as abnormally swollen. Supraclavicular nodes that can be felt are always regarded as abnormal[2]. Although the precise incidence of lymphadenopathy is unknown, it ranges from 38 to 45%[3]. Since viral or bacterial infections that are self-limited are the most frequent causes, the majority of these are caused by benign self-limited disease processes[4]. However, some young children may have lymphadenopathy if they have an underlying significant systemic illness or cancer. It can be challenging to tell when an adenopathy is severe enough to warrant further investigation into a more serious underlying disease process or merely a normal reaction to numerous viral or bacterial infections.

The examination of a child with lymphadenopathy is a common clinical scenario for paediatricians. Lymph node enlargement is a common condition in children. About 80–90% of children have palpable nodes in the cervical area[5]. Children's lymph nodes can be felt as early as the new born stage. With continued antigenic exposure, as in children, the lymphoid tissue continues to proliferate and increase during puberty, demonstrating the nodes' significant capacity for development and change[6]. The lymphatic veins that drain lymph from the majority of the body's tissues terminate at lymph nodes because they are a component of the reticuloendothelial system. The optimum initial line of defence against pathogens is provided by the presence of a large number of phagocytic cells, antigen-presenting cells, and lymphocytes. As a result, the majority of healthy kids have palpable cervical lymph nodes. It is however crucial to determine, if they are excessively big and whether they are connected to an underlying illness process. These are some of the main concerns for the parents and paediatricians who are taking care of the children. There are several possible diagnoses for lymphadenopathy. Therefore, in order to narrow this differential, a detailed medical history and diligent clinical examination are crucial.

During the evaluation of lymphadenopathy in children, the distribution of the swollen lymph nodes is of critical importance[7]. The findings of the physical examination offer crucial hints about the underlying cause. Signs of inflammation in the skin and soft tissue that the swollen nodes drain should be investigated. Lymph nodes need to be evaluated for their shape, location, mobility, presence of cellulitis or periadenitis, and presence of skin abnormalities like erythema and elevated body temperature. It is important to examine any organomegaly and look for indicators of a systemic illness.

Although the underlying etiology vary from region to region however clinico-pathological correlation hold critical importance in quick diagnosis and appropriate treatment. The etiologies associated with lymphadenopathy have been characterised as infectious and non-infectious. Infectious etiologies include acute viral lymphadenitis (common form of reactive lymphadenopathy), Acute Bacterial Lymphadenitis (main reasons of acute cervical lymphadenitis in children), Subacute Lymphadenitis, Mycobacterium Tuberculosis, Atypical Mycobacterium, Cat Scratch Disease and Toxoplasmosis. Non-infectious etiologies include

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Kikuchi-Fujimoto Disease (also known as necrotizing lymphadenitis), Kawasaki Disease, Sarcoidosis, Langerhans Cell Histiocytosis and Malignancies[8]. In one of the cases reported previously, infestation of *Pediculus h. capitis* has also been attributed to be the underling cause of cervical lymphadenopathy[9].

Even though the underlying cause is frequently a simple, self-limiting infection, more significant underlying causes must be promptly identified and addressed quickly.

Material and methods

This study was retrospective and descriptive. Data has been taken from the case files of all patients seen at the Dr.D.Y. Patil Medical College and Hospital, Pune (2021-2022). The age ranged from 1 month to 12 years. The Health Research and Ethics Committee of the Dr. D.Y.Patil Medical College and Hospital, Pune approved the study and waived the requirement for informed consent.

Study Tools: Age, duration of symptoms, size, consistency and mobility of lymph nodes, site of inflammation, tenderness, associated findings, blood counts, throat culture, Fine Needle Aspiration Cytology (FNAC), Mantoux test and chest X-ray findings were all taken into account. The received data was compiled in Microsoft Excel 2016 and analyzed using GraphPad Prism 8.0.2.

Results

The total of 50 patients were included in this study out of which 62% were males and 38 % were female with age ranging between 1 month to 12 years (Table 1, Figure 1).

AGE	NUMBER OF CASES	PERCENTAGE	SEX	NUMBER OF CASES	PERCENTAGE
1 MONTH-4 YEARS	7	14	MALE	31	62
4 YEARS TO 8 YEARS	22	44	FEMALE	19	38
8 YEARS TO 12 YEARS	21	42			

Table 1: Distribution of cases based of Age and Sex.

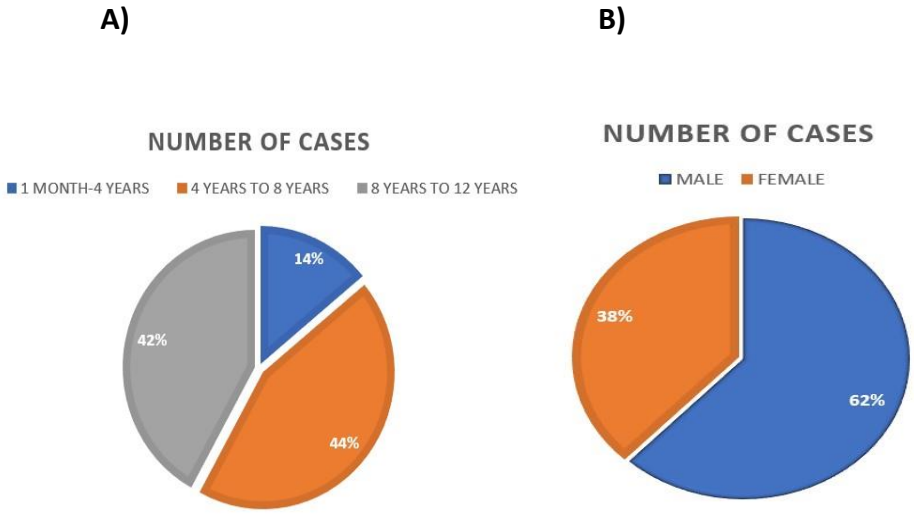

Figure 1: Distribution of cases based on: A) Age. B) Sex

Several symptoms were presented by the patients either in isolation or combined with other symptoms. Swelling in neck as one of the symptoms was present in majority of patients (90%). Fever (70%), cough (70%), loss of appetite (40%), sore throat (36%), painful swelling and weight loss (26% each), ear discharge (8%) and orodental pain (6%) were other major symptoms. More than one symptom was shown by 68% of the patients (Table 2, figure 2).

SYMPTOMS	NUMBER OF CASES	PERCENTAGE
SWELLING IN NECK	45	90
PAINFUL SWELLING	13	26
FEVER	35	70
COUGH	36	72
WEIGHT LOSS	13	26
LOSS OF APPETITE	20	40
SORE THROAT	18	36
EAR DISCHARGE	4	8
ORODENTAL PAIN	3	6
MORE THAN ONE SYMPTOM	34	68
HISTORY OF TB CONTACT	4	8

Table 2: Distribution of cases based on the symptoms presented.

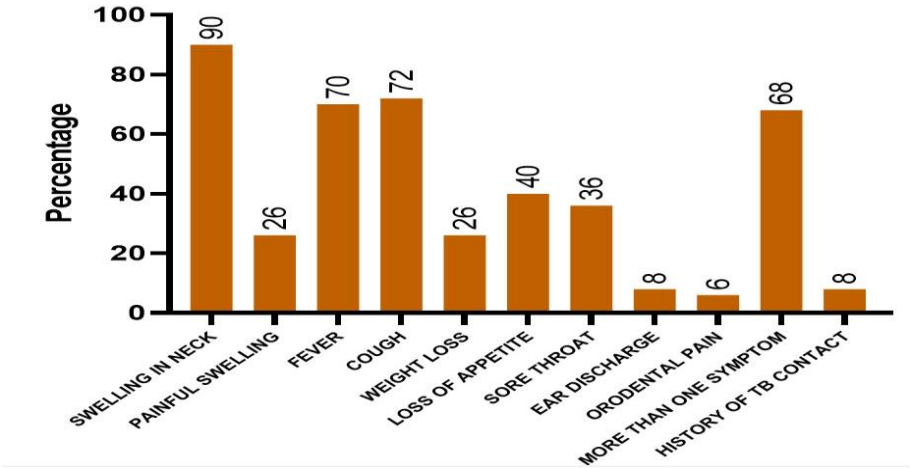

Figure 2: Distribution of cases based on the symptoms presented.

Duration of symptoms was analysed and it was found that majority of patients had swelling (75.5%), fever (68.5%) and cough (66.6%) for less than 1 month (Table 3, Figure 3).

DURATION OF SYMPTOMS	SWELLING		FEVER		COUGH	
	NO.	%	NO.	%	NO.	%
<1 MONTH	34	75.5	24	68.5	24	66.6
1 MONTH-6 MONTHS	9	20	9	25.7	12	33.3
> 6 MONTHS	2	4.5	2	5.7	0	0

Table 3: Distribution of cases based on the duration of symptoms.

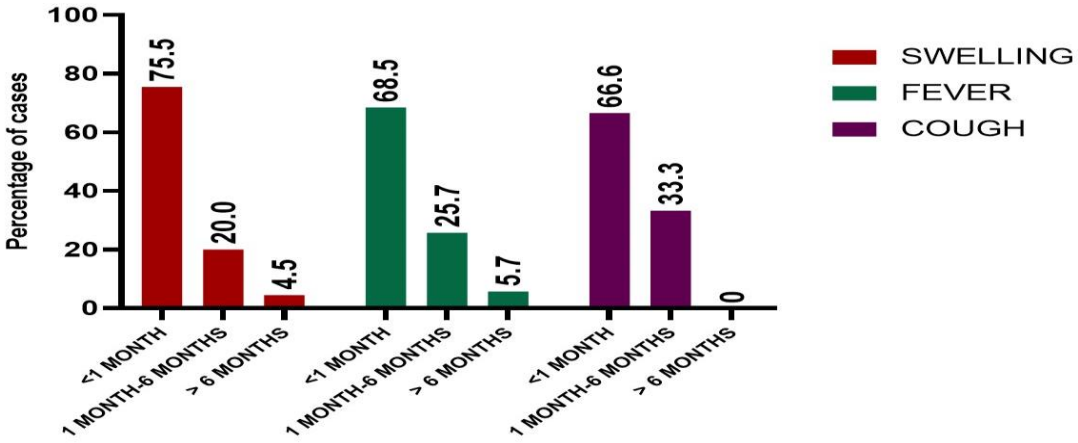

Figure 3: Distribution of cases based on the duration of symptoms.

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Nature of lymph node including size, consistency and mobility, was examined in all cases and majority of cases had lymph node of size 1-2 cm (76%), firm consistency (84%) and mobile (66%) (Table 4, Figure 4).

SIZE	NUMBER OF CASES (Percentage)	CONSISTENCY	NUMBER OF CASES (Percentage)	MOBILITY	NUMBER OF CASES (Percentage)
1-2CM	38 (76)	FIRM	42 (84)	MOBILE	33 (66)
2-4 CM	12 (24)	SOFT	8 (18)	MATTED	17 (34)
>4 CM	NIL (0)	RUBBERY	NIL (0)		

Table 4: Distribution of cases based on the nature of lymph node

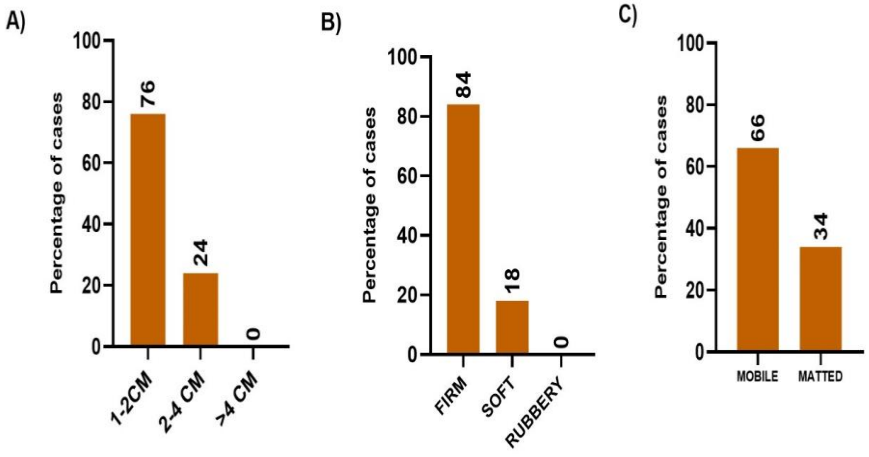

Figure 4: Distribution based on nature of lymph node: A) Size B) Consistency C) Mobility

Site of inflammation was evaluated for all the cases. The most common site of inflammation was anterior cervical (48%) followed by posterior cervical (34%), posterior auricular (8%), submandibular (6%), supra cervical (4%). None of the cases had any inflammation in occipital region (Table 5, figure 5)

SITE	NUMBER	PERCENTAGE
Posterior cervical	17	34
Submandibular	3	6
Anterior cervical	24	48
Supra cervical	2	4
Occipital	NIL	0
Posterior auricular	4	8

Table 5: Distribution of cases based on site of inflammation

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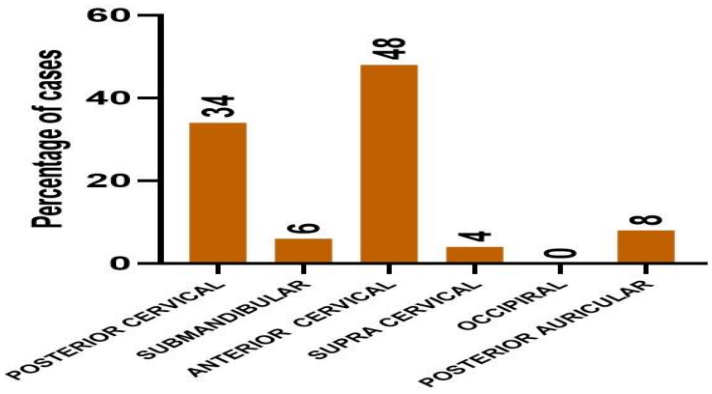

Figure 5: Distribution of cases based on site of inflammation

During the evaluation of symptoms several associated findings found in all the cases that included tonsilitis (24%), ear infection (16%), hepato/spleenomegaly (16), orodental infection (6%), skin lesion and rash (4% each) Table 6, figure 6).

Associated findings	Number of cases	Percentage
Tonsillitis	12	24
Ear infection	8	16
Skin lesions	2	4
Orodental infections	3	6
Hepato/spleenomegaly	8	16
Rash	2	4

Table 6: Distribution of cases based on associated findings.

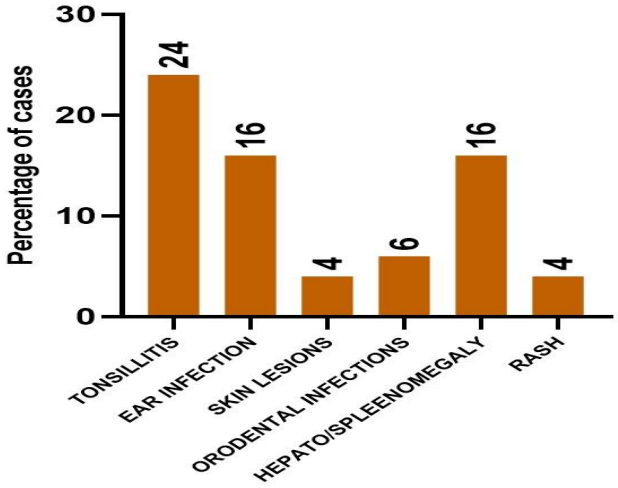

Figure 6: Distribution of cases based on associated findings.

Blood counts evaluation was done and the results showed neutrophilia in majority of cases (56%), followed by leucocytosis (52%), anaemia (32%), lymphocytosis (24%) and eosinophilia (8%). ESR was normal in 64% of the cases (Table 7, Figure 7).

BLOOD COUNTS	NUMBER OF CASES	PERCENTAGE
LEUCOCYTOSIS	26	52
NEUTROPHILIA	28	56
LYMPHOCYTOSIS	12	24
EOSINOPHILIA	4	8
ANEMIA	16	32

Table 7.1: Distribution of cases based on blood count

ESR	NUMBER	PERCENTAGE
NORMAL	32	64
INCREASED	18	36

Table 7.2: Distribution of cases based on ESR.

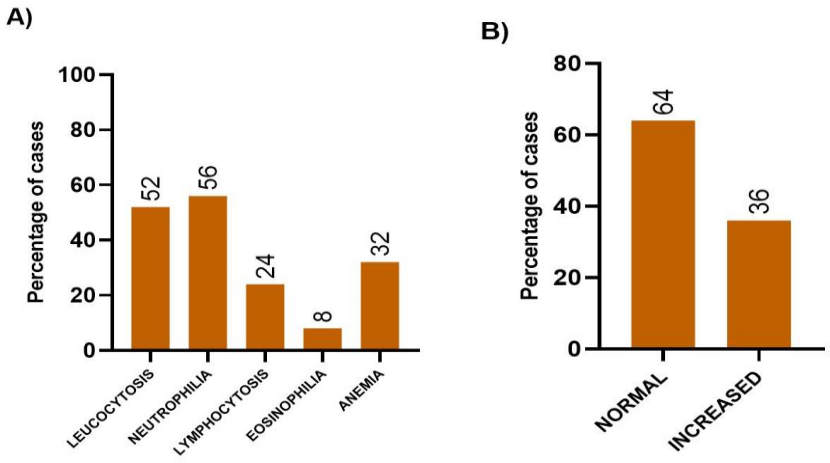

Figure 7: Distribution of cases based on: A) Blood count B) ESR

Samples were taken for throat culture from 6 patients to identify the presence of microorganisms. Throat culture resulted in 50% of cases showing normal commensals while as *streptococcus* and *staphylococcus* was found in 33% and 16% of cases respectively (Table 8, figure 8).

Microorganism	Number	Percentage
Staphylococcus	1	16
Streptococcus	2	33
Normal commensals	3	50

Table 8: Distribution of cases sent for throat culture.

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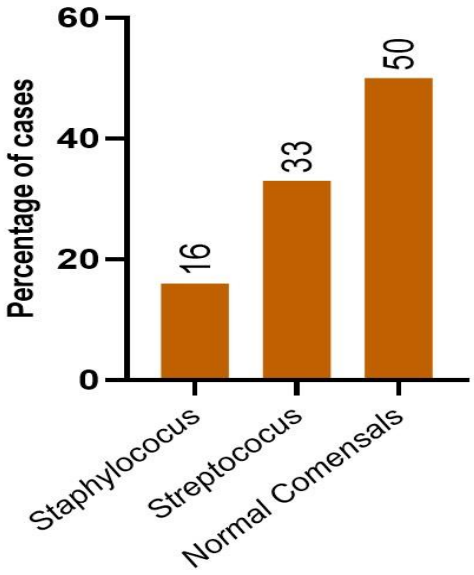

Figure 8: Distribution of cases sent for throat culture.

FNAC was performed in all patients and majority of the cases showed reactive (46%), while other findings included TB (32%), suppurative (12%), tumor (6%) and inadequate (4%) (table 9, figure 9).

FNAC CYTOLOGY	NUMBER	PERCENTAGE
TB	16	32
SUPPURATIVE	6	12
REACTIVE	23	46
INADEQUATE	2	4
TUMOUR	3	6

Table 9: Distribution of cases based on FNAC.

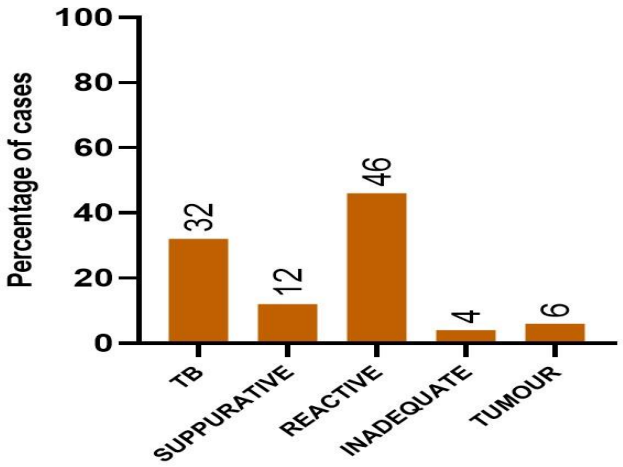

Figure 9: Distribution of cases based on FNAC

Mantoux test was also done for all the cases in the study. The results showed negative in 66% of the cases (Table 10, figure 10).

MANTOUX TEST	NUMBER OF CASES	PERCENTAGE
POSITIVE	17	34
NEGATIVE	33	66

Table 10: Distribution of cases based on the Mantoux test results.

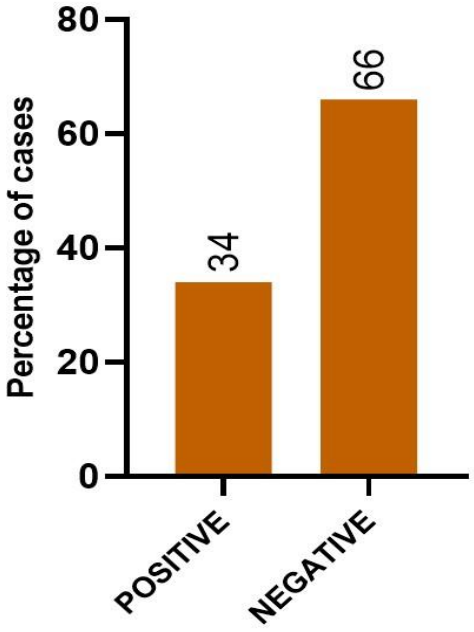

Figure 10: Table 10: Distribution of cases based on the Mantoux test results.

A total of 23 patients were sent for chest X-ray, out of which 12 (24%) showed normal X-ray findings (table 11, figure 11).

CHEST XRAY FINDINGS	NUMBER OF CASES	PERCENTAGE
NORMAL	12	24
ABNORMAL	11	22

Table 11: Distribution of chest X-ray results.

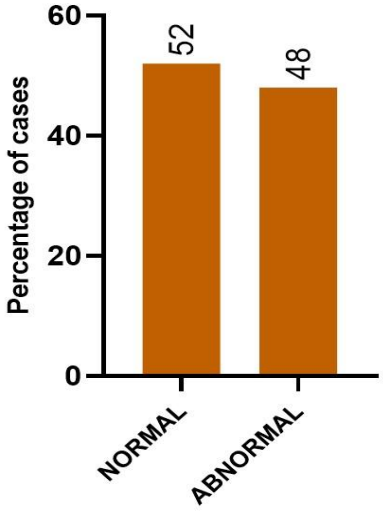

Figure 11: Distribution of chest X-ray results.

Discussion

In the current study, 50 cases of lymphadenopathy were examined in-detail over a period of 18 months, from February 2021 to June 2022,in the department of Paediatrics at Dr. D. Y. Patil Medical College and Hospital, Pune. This involved taking patient's history, performing thorough clinical examination, and conducting pertinent investigations. A common clinical condition for which a child is admitted to the hospital for assessment is lymphadenopathy. In the current study, 44% of patients with lymphadenopathy were between the ages of 4 and 8 years old.

The current study was in correlation with other previous studies in which the reported incidence was 55%[10]. The incidence between 5-10 years was reported to be 48.59% in another related study[11]. In concurrence, this study's results revealed that lymphadenopathy was more prevalent in children between the ages of 4 and 8 years. Furthermore a concurrent study that covered 86 cases, the incidence among children between the ages of 4 and 8 was 37 instances, or 43%[12].

In this study swelling in neck as one of the symptoms was present in majority of patients (90%). Fever (70%), cough (70%), loss of appetite (40%), and sore throat (36%) were the other major symptoms shown by the patients. The results of this study are in concurrence with the pevious studies, where 52% cases were presented with swelling in the neck followed by 48% of cases with fever and cough each[10].

Among 50 cases the common age group was 4year to 8 years in 44% children. Cytological examination revealed reactive lymphadenitis in 46% cases, tubercular lymphadenitis in 32% cases and Suppurative lymphadenitis in 12% cases. However, 4% cases yielded inadequate aspirate.

In the present study, Out of 50 cases, upper anterior cervical nodes were commonly involved (48%) followed by posterior cervical lymph nodes (34%). Submandibular lymph nodes were palpable in 6%, Posterior auricular in 8%, and Supraclavicular in 4% of cases. Occipital lymph node enlargement was not found during study. A previous study carried out in 86

cases out of which 38 cases are anterior cervical group, concluded that anterior cervical group(44.1%) of lymph nodes are more commonly affected followed by posterior cervical(32.5%) which is similar to this study[5].

In this study we found that common organisms found in throat culture were normal commensals (50%) followed by *Streptococcus* (33%) and *Staphylococcus* (16%). However, previously reported studies show that incidence of *Pseudomonas* and *Staphylococcus aureus* was 19% and 22% respectively[13]. FNAC was done in all 50 cases in the evaluation of children with lymphadenopathy for proper establishment of diagnosis and institution of appropriate treatment. Histopathological examination revealed reactive hyperplasia in 46%, tuberculosis in 32%, suppurative lymphadenitis in 12%, tumor (6%). In 4% cases FNAC was done but inadequate aspirate was found. The cytological evaluation in the present study was comparable to the studies carried out peviousl[14].

Conclusion

Lymphadenopathy is one of the most frequent clinical conditions for which a child is admitted to the paediatrics department for evaluation, diagnosis, and the initiation of treatment. The age range of 4 to 8 years, which is in the lymphoid phase of development, has a higher frequency of lymphadenopathy. The incidence of cervical lymphadenopathy is more when compared with other sites because of location of a greater number of lymph nodes in the neck and also the incidence of diseases is more common in and around the oral cavity. Following a comprehensive examination, routine tests like the TC, DC, ESR, Mantoux test, and X-ray chest are crucial to establishing a diagnosis like tuberculosis. The most frequent cause of lymphadenopathy in children is reactive lymphadenitis, followed by tuberculosis. FNAC is a simple bedside investigation, despite being invasive it is quite valuable for diagnosing a wide range of cases. Because of its simple procedure, it is favoured as a first line investigation even though it may not be a replacement of lymph node biopsy. As an initial diagnostic tool, it is a less time-consuming for outpatient treatment and is safe and reliable.

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