

Tuberculosis in Children—the Role of Fine Needle Aspiration

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Two hundred and eighty children with enlarged lymph nodes underwent fine needle aspiration (F.N.A.) at The Children's Hospital & Institute of Child Health, Lahore during the 36 months period from April 1997 to April 2000. Granulomatous lymphadenitis was diagnosed in 92 cases (32.8%). There were 48 males and 44 females and their ages ranged between 1-16 years. The most commonly aspirated nodes were cervical and the most characteristic morphologic features among these cases were epithelioid clusters with or without caseation necrosis. Zeil Neelson stain was positive in four cases and culture for mycobacterium tuberculosis was positive in eight cases. In most of the cases there was clinical history highly suggestive of tuberculosis followed by a documented response to antituberculous therapy.

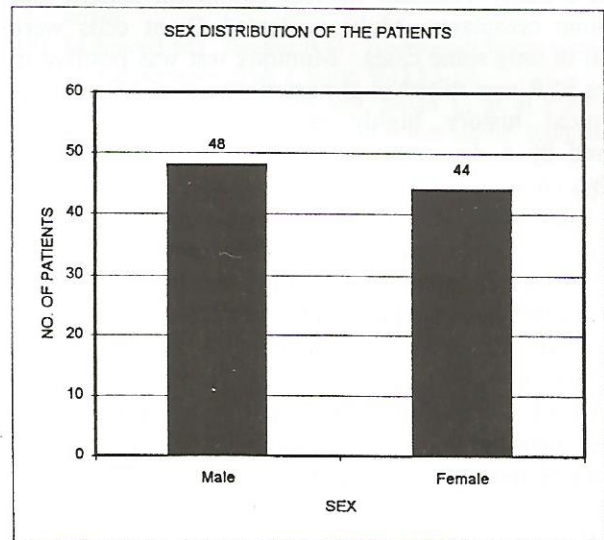
F.N.A. is an easy and effective way to diagnose tuberculosis in children and it spares surgical intervention.

Key Words: Fine Needle Aspiration (FNA), tuberculosis

Tuberculosis continues to be a common health problem in under developed and developing countries¹. Its incidence is also increasing in the developed world, where it had long been considered to be a disease of little importance². Mortality due to infectious diseases appears to be increasing³. Factors that are thought to be important include microbial evolution, population growth particularly in urban megacities in the less developed world, climate change, environmental habitat disruption and large scale movements of persons across international borders⁴. Tuberculosis is one of the commonest infectious diseases in the third world countries including Pakistan. In spite of significant awareness in the community, availability of diagnostic facilities and curative medications, millions of people suffer from tuberculosis⁵. In children it remains misdiagnosed, under diagnosed or paradoxically over treated as a result of diagnostic difficulties and non-specific manifestation, such as lymph adenopathy⁶. Fine needle aspiration biopsy has proved its usefulness in the diagnosis of a wide variety of benign and malignant neoplasms, this procedure is also very valuable in the diagnosis of tuberculosis. Experience in the use of F.N.A. biopsy in diagnosing tuberculosis is limited⁷⁻⁸, however according to our results fine needle aspiration is justified as a first diagnostic step if lymph node tuberculosis is suspected. A positive result can be regarded as conclusive and spares surgical intervention. Since negative results do not exclude tuberculosis they justify surgical excision for final diagnosis.

Patients and Methods

A total of 280 fine needle aspirations were carried out in our department during the 36 months period, from April 1997 to April 2000 and the diagnosis of granulomatous lymphadenitis was given in 92 cases (32.8%). The ages of the patients ranged between 1-16 years. There were 48 males and 44 females as shown in graph I.



The biopsied lymph nodes measured 1-6 cm (mean 2.3 cm). Most of the aspirated nodes were cervical. At the time of aspiration clinical information was obtained regarding the time of onset and duration of the enlarged lymph nodes. Most of the patients belonged to a poor socio-economic class and all F.N.A.'s were performed as an out door basis, by using a 22 guage needle and standard techniques. The prepared smears were stained with Hematoxylin, Eosin and Giemsa stain. F.N.A. material was submitted for bacteriologic culture in 20 of the 92 cases with a positive culture of Mycobacterium obtained in eight of the twenty cases. Z.N stain was positive in four of twenty cases. No major or minor complications occurred in our study.

Results

The role of FNA in the diagnosis of tuberculous lymphadenitis has been discussed in numerous studies. In

our study most of the enlarged lymph nodes were located in the cervical region and the cases reviewed were divided into three categories as shown in table I.

Table 1 Morphologic Picture in 92 cases of granulomatous lymphadenitis

Type of Lesion	No. of Cases	%age
Epithelioid granulomas without caseation necrosis	18	19.2
Epithelioid granulomas with caseation necrosis	62	67.3
Caseation necrosis without Epithelioid granulomas	12	13.0

In 18 (19.2%) cases there were epithelioid granulomata without caseation necrosis. Granulomas were defined as aggregates of epithelioid cells with oval to elongated nuclei, a finely vesicular nuclear chromatin pattern and pale blue cytoplasm. Multi nucleated Giant cells were present in only some cases. Montoux test was positive in 8 cases ESR was raised in almost all the cases. There was a clinical history highly suggestive of tuberculosis followed by a documented response to anti-tuberculous therapy.

In 62(67.3%) cases the cytologic picture revealed multiple epithelioid granulomata with caseation necrosis. In eighteen of the cases, these granulomas were small (10-15 cell) aggregates of epithelioid cells. The remaining 44 cases had numerous granulomas of varying sizes. Additional morphologic features in these cases were presence of variable number of histiocytes, lymphocytes and polymorphonuclear cells. Montoux test was positive in 38 cases and ESR was raised in 46 cases.

No granulomas were present in 12(13%) of the cases. Consistant cytologic features in these cases included, clumps of amorphous acellular material in which varying numbers of degenerating cells, polymorphs and lymphocytes were evenly distributed. In a majority of these cases foamy macrophages and histiocytes were present. Montoux test was positive in 3 cases and ESR was raised in 8 cases.

FNA material was submitted for bacteriologic culture in 20 of the 92 cases with a positive culture of mycobacterium tuberculosis obtained in 8 of the 20 cases. ZN staining was positive in 4 cases.

According to our results a fine needle aspiration is justified as a first diagnostic step if lymph node tuberculosis is suspected.

The results indicates that studying FNA smears by light microscopy and in some cases bacteriologic culture is an effective way of diagnosing tuberculosis.

Discussion

Tuberculosis is not an uncommon disease in our part of the world⁹. It usually involves lymph nodes, lungs, urogenital tract, bones and intestine¹⁰. The peripheral

lymph nodes represent 41% of the most commonly involved extra pulmonary sites¹¹. Over the last decade myco bacterial infections have been shown to be on the rise in all parts of the world¹. At present cervical lymph node tuberculosis is of clinical relevance on one hand in patients from endemic areas of tuberculosis in the developing countries and on the other hand in immuno compromised patients particularly in the course of HIV infection. The diagnosis of tuberculous cervical lymphadenopathy should thus be entertained when there is painless cervical lymphadenopathy with fever, night sweats, loss of appetite, anemia and raised ESR. The incidence of tuberculosis is high in urban areas of Lahore. It mainly affects young males and females of unfavoured socioeconomic classes. The high number of active cases evidences the shortcomings in late diagnosis, lack of knowledge and poor socio economic conditions. These facts together with the high rate of non-compliance of treatment may explain the seriousness of current situation in our country.

Hope of drastic reduction in the incidence of tuberculosis with the availability of anti-tuberculous agents has not been realized. In their 20 years study Mahmood and Asghar have shown the number of patients with the conditions remained constant in each 5 year period from 1971 - 91¹² The incidence of tuberculosis is on the rise in other parts of the world as well. In a study carried out at Turkey by Erosoz and Palat, they screened 63 lymph nodes and out of them 32 aspirates 50.7% revealed granulomatous lymphadenitis. Ziehl Neelsen staining was negative in all the cases and on cultural mycobacterium tuberculosis was demonstrated in 19 cases¹³.

Another study was carried out at Nigeria by Thomas Jo and Adeyi D Amanuro H, according to their results tuberculosis was the most frequent diagnosis in FNA of cervical lymph nodes (25.7%) and it was the most commonly diagnosed infective condition particularly under the age 20¹⁴. This shows higher incidence of tuberculosis in developing countries like ours

In our study Montoux test was positive in most of the cases. Tuberculin reaction is an invaluable instrument of epidemiological investigation. Clinically the value of tuberculin test, though remarkable is limited by the fact that its positivity is not necessarily a sign of active tuberculosis¹⁵.

Male to female ratio is variable in different studies. Some have documented high prevalence in young females while others have noted that disease affects both sexes equally¹⁶. The present study also shows almost equal incidence in males and females.

The raised level of ESR was a constant finding in our study. This is in accordance with other studies¹⁷. Bacteriologic culture of FNA biopsy material is also

highly recommended for confirming the presumptive diagnosis of tuberculosis. In our cases culture was positive for mycobacterium tuberculosis in eight of the twenty cases. This is in spite of the fact that the amount of aspirated material left after making the cytological smears was inadequate for the culture.

FNAC was found to be a useful adjunct diagnostic technique especially in children, but the need to develop a more sensitive and easily available method to diagnose tuberculosis in asymptomatic and high risk children still persists. For FNA it is important to select patients with lymphadenopathy for more than 3 weeks as otherwise non specific changes and acute inflammatory changes are likely to interfere with the diagnosis⁵.

Clinical history, physical examination, correct performance of FNA and proper handling of the aspirates are the four essential components in the management of patients with tuberculous lymphadenopathy¹⁸

Conclusion

1. FNA is an easy and effective way to diagnose tuberculosis in children and it spares surgical intervention.
2. The diagnosis of granulomatous lymphadenitis, consistent with tuberculosis can be given, even though the acid fast stains are negative.
3. It is necessary to perform several aspirations from different sites of the enlarged lymph nodes.
4. An open biopsy is recommended if there is discrepancy with the clinical impression.

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