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Tuberculosis Detection among Children with Human Immunodeficiency Virus Infection using Osborne's Criteria

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Abstract- **The mortality due to tuberculosis is high among the human immunodeficiency virus (HIV)-infected children. A confirmative diagnosis of tuberculosis is difficult to obtain, especially in a resource-limited setting. A clinician might, therefore, go for the diagnostic criteria with higher sensitivity to avoid under-diagnosis and delayed treatment. The diagnosis of probable tuberculosis by Osborne's method is a good option in such a situation. The present study includes 42 HIV-infected subjects diagnosed with probable tuberculosis using Osborne's method. During a treatment period of 6-9 months; 39(91%) "felt better", 28(67%) gained weight and 2 (4.7%) died.**

I. Text

Of the estimated 7.5 million cases of tuberculosis; 650,000 (9%) have occurred in children1. The estimates have limitations since there are difficulties in establishing a definitive diagnosis of tuberculosis more so when associated with HIV infection. The symptoms of childhood tuberculosis are non-specific, the radiographs are difficult to interpret, and a bacteriological confirmation is rarely achieved. In view of this, we have studied the effect of treatment on the probable cases of tuberculosis as categorized by Osborne's method 2.

The present study was conducted at the pediatric outpatient department of Sassoon General Hospital, Pune. The hospital, a tertiary care center, is also a regional center for antiretroviral therapy (ART). One hundred and eighty eight patients with tuberculosis, registered at the outpatient department, were studied. The demographic data and clinical details were collected in a pre-determined format. A diagnosis of probable tuberculosis was made when a child with suspected tuberculosis had any of the following: a positive Mantoux test, suggestive radiological findings, suggestive histological appearance in biopsy and a favorable response to the anti-tuberculosis treatment 2. The subjects of this study were the cases of probable tuberculosis with age above 18 months and a positive ELISA test for HIV infection. The presenting complaints, clinical features, chest radiograph findings and Mantoux test results were recorded. The nutritional status was graded as per Indian Academy of pediatrics guidelines 3. The parameters of subjective and objective improvement were identified. The subjective improvement meant better activity, better appetite and feeling of wellness and the objective improvement was indicated by a weight gain and a change in nutrition grade, if any, during monthly visits.

As shown in the table, of the 188 subjects, 42 (25%) had a positive ELISA test for HIV infection. The cases of probable tuberculosis were more common among the boys and in the age group 6-10 years. Severe malnutrition was observed in 40.5%. After the treatment, 39 (91%) demonstrated a subjective improvement, substantial weight gain was observed in 47.5%. Nutrition grade changed from IV to III in 8 (19%), III to II in 7(16.6%), II to I in 4 (9.5%), I to normal in 4 (9.5%), and it remained unchanged in 16 (38%). The Mantoux test was positive, more than 5 mm, in 13 (30.9%) cases. An intrafamilial contact with an adult case of pulmonary tuberculosis was observed in 19 (45.5%). The chest radiograph findings were as follows: normal-5 (11.9%), mediastinal adenopathy- 20 (47.6%), parenchymal lesions- 11 (26.1%) and a miliary disease- 6 (14.2%).

The mortality has been reported to be six times higher among HIV infected- children with tuberculosis4. The conventional criteria result in under-diagnosis and under-treatment of tuberculosis in children, more so in presence of HIV infection. In view of a high mortality among untreated children, the treatment needs to be offered not only to bacteriologically confirmed cases, but to also to most likely cases, even at the risk of some over-treatment.

The published studies of children with tuberculosis in sub-Saharan Africa and elsewhere have shown a co-infection rate (with HIV) of 11-64%5. A high proportion of HIV infection among our subjects is largely because ours is a tertiary care center and also a regional center for ART. A smaller proportion of under-fives may be a reflection of initiative against mother-to-child-transmission (MTCT) taken up on a large scale. Secondly, deaths due to unrecognized and untreated Pneumocystis pneumonia among younger children may also be responsible for this finding6. A co-existence of

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PEM and the response to treatment in terms of a weight gain and a change in nutrition grade has been on expected trails. The presence of intra familial contact in 45% cases may, in fact, be included among the diagnostic criteria. The studies have found that the mothers with tuberculosis are important source of tuberculosis transmission to children7.

Points to remember

1. Definitive diagnosis of childhood tuberculosis is difficult especially in children with human immunodeficiency virus infection.
2. Osborne's classification of childhood tuberculosis is useful in detecting probable cases.
3. This avoids under diagnosis and delayed treatment.

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Table 1: Distribution of parameters

1. Age		
Up to 5 years	2	4.7
6-10 years	26	61.9
11-15 years	14	33.3
2. Gender		
Male	25	59.5
Female	17	40.5
3. Nutritional Status		
Normal	4	9.5
Grade I PEM	5	11.9
Grade II PEM	16	38
Grade III PEM	14	33.3
Grade IV PEM	3	7.2
4. Mantoux Test		
Positive	13	45.5
Negative	29	54.5
5. Intrafamilial Contact		
Present	19	45.5
Absent	23	54.5
6. Chest X ray Findings		
Normal	5	11.9
Mediastinal adenopathy	20	47.6
Parenchymal disease	11	26.1
Miliary lesions	6	14.2

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