Pattern of Tuberculosis in Immunized and Non Immunized Children

M A BUTT M A SIDDQUI A ASHRAF Z ANSARI
Department of Paediatrics, Punjab Medical College, Faisalabad.

Correspondence to Dr. Muhammad Asghar Butt

A total of 100 consecutive children irrespective of age and sex discrimination who presented to the Department of Paediatrics, Allied Hospital, Faisalabad and diagnosed as tuberculous were studied prospectively. The age range was 3 months to 14 years with mean age 3.9 years. 61 patients were male and 39 female with M:F ratio 3:2. The pattern of tuberculosis in immunized as well as non immunized children was observed 28% of the children were immunized with BCG and they had pulmonary tuberculosis as major presentation. On the other hand 72% of children were non-immunized and they had extra thoracic manifestations such as meningeal, skeletal and abdominal tuberculosis. It is recommended BCG vaccination still is good tool for prophylaxis against systemic tuberculosis.

Key words: Childhood tuberculosis, BCG immunization.

Tuberculosis is one of the major causes of mortality and morbidity amongst vaccine preventable diseases in Pakistan.1,2,3 About two billion people worldwide are carriers of Mycobacterium Tuberculosis,4 of which 95% are in developing and only 5% in developed world. It causes about 2.7 million deaths annually which is about 5% of the deaths globally.5

Although there has been gradual decline in its prevalence because of improved public health measures but there is again gradual increase in the incidence since 1985.5,6

In Pakistan more than 100 cases are present per 100,000 population with annual infection rate as 7%.4 The younger age group is at higher risk. The infected children in fact gives reflection of open TB cases in the community.

BCG vaccination, one of the most widely used tool for prevention of tuberculosis world wide, gives protection upto 80% which may last for 10 years.6,7 There is emerging consensus that BCG immunization reduces the risks of extra pulmonary forms of the disease like disseminated T.B, tuberculous meningitis etc.7

The prospective study was designed to share the observations and experiences about the types and sites of involvement in tuberculosis in vaccinated children and to compare it with non vaccinated children.

Aims and objectives

To study the pattern and sites of involvement in Tuberculosis in immunized and non-immunized children.

Patients and Methods

This prospective case study was conducted in 100 consecutive children 3 months to 14 years old of either sex admitted in Paediatrics department of Allied Hospital, Faisalabad, during April 1997 to June, 1998.

A proforma was prepared for necessary information like age, sex, socio economic status, educational status of parents, number of family members living in the house, history of contact to tuberculous patient and vaccination status of the child.

A detailed clinical examination including all the systems was carried out to categorize the type of TB. The BCG scar was noted in each child as a confirmation of immunization.

The degree of malnutrition was assessed by WHO classification based on weight for age, which is as follows:

I. degree malnutrition: weight 70-80% of expected for age
II. degree malnutrition: weight 60-70% of expected for age.
III. degree malnutrition: weight<60% of expected for age.

The investigations carried out were:

CBC with ESR, X-ray chest, Montoux test. (An induration of 10mm or more was considered as positive while 5-10mm as doubtful and less than 5mm as negative).

Lumbar puncture for CSF in case of suspected TBM.
CT brain for brain involvement and hydrocephalus in case of TBM.

Tapping of pleural, pericardial and ascitic fluid for cytological and biochemical examination where indicated.

Excisional biopsy of lymph node in case of nodal involvement.

Diagnosis of abdominal TB was based on history, Montoux test, ascitic fluid examination and clinical response to anti-TB drugs.10,11 Pulmonary TB was diagnosed on the basis of chronic cough not responding to routine antibiotics, positive radiological findings, Montoux test and clinical and radiological response to anti-TB drugs. Diagnosis of tuberculous meningitis was
based on neurological signs along with CSF findings such as high protein and low glucose contents as well as lymphocytic predominance in CSF, also supported by CT scan of brain. The culture for M. Tuberculosis was not done because of lack of facilities.

Discussion
Tuberculosis is still a great public health problem. Although no age, race or socio-economic group is immune but poor, overcrowded and malnourished population is at greatest risk. Where the prevalence is high it manifests at an early age, but it presents late where prevalence is low. The early forms include disseminated disease, TBM etc. In unvaccinated children the extrapulmonary TB is common where other systems are involved with or without lung disease.

The contact history to tuberculous patient has been considered very important but in our study it was found in 27% of children. This is in line with other studies in India and Pakistan but contradicts to the findings in developed world e.g., Japan where it was 74%.

Sixty eight percent of the children were moderate to severely malnourished at the time of diagnosis. This parallels with many other studies. It is presumed that either TB leads to progressive weight loss and consequently malnutrition. The other view is that poor nutritional status of the individuals impairs immune mechanisms which results in susceptibility to infection.

Although there is wide range for age but majority of children (about 70%) were below the age of 5 years which testifies that younger the subject is, greater is the likelihood of infection and its dissemination. The studies in Pakistan and neighbouring countries also support this findings.

Males were found affected more in our study. The M:F ratio was 3:2 correlating with other studies in India and Pakistan. The males in our society have more exposure to external environment. They also are preferred if treatment is needed for any disease, which reflects the more concern about males members in our society.

28% of the children in this study were immunized with BCG. This figure is very alarming and indicates the poor education, lack of awareness and low education level in our country. The awareness needs to be generated through media and health workers.

The tuberculosis confined only to lungs was present in 33% of children out of which 50% were immunized. But the children with systemic involvement alongwith pulmonary TB were 72%. The pulmonary manifestations of TB were many fold, varying from hilar lymph nodes involvement to frank effusion and even pneumothorax. Majority of these children were unimmunized. The studies in India and Pakistan reveal that extrapulmonary tuberculosis is more commonly observed in unimmunized children because of deficient immune status. It is these children who are seriously ill and need hospitalization. The mortality and morbidity are also high in such children. On the other hand the children with pulmonary tuberculosis most of the time get treatment on outdoor basis and are rarely hospitalized.
Taberculous meningitis in our Country is still a great problem. In this study out of 43 cases of TBM, 19 were TBM alone (44.2%) and 24 were with lung and lymph nodes involvement. Out of these only 4 patients were immunized. The correlation between immunological status and number of cases of TBM, speculate the impact of BCG immunization of the site of tuberculosis.1,2,21

Tuberculous lymphadenitis is the second most common variety of extrapulmonary TB in our study. The posterior cervical group is more commonly involved. 17 cases (17% of total patients) were found having nodal involvement alone or in combination with pulmonary or meningeal TB. Only one out of these patients (approx. 6%) was vaccinated. It also speculate that BCG vaccination does have an impact of prevention or localizing the disease lungs or one system alone.3,7,8

The abdominal tuberculosis which presented in the form of ascites, hepatosplenomegaly and intestinal symptoms was present in 2% of total patients out of which one was vaccinated. This also compares with other studies.10

Similarly 2 cases of skeletal TB presented in the form of caries spine and vaccination status was similar to that of TB of abdomen.

Conclusion
Lung is the most commonly inflicted site by tuberculosis followed by tuberculous meningitis and tuberculous lymph nodes involvement.

Malnutrition leads to easy susceptibility to tuberculosis in our society and this needs to be prevented by in-time measures.

Immunization does have an impact on restricting the disease to the lung and help in preventing the systemic spread.

Even with the best efforts vaccination status is still alarmingly low which needs a prompt action by various authorities.

References