
INVITED ARTICLE

Utility of Tuberculin Testing in Children
Under 5 Years of Age

by

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Abstract

The usefulness of the tuberculin sensitivity in children as an index of tuberculosis was evaluated in terms of the conversion index. Out of 62 children, 27 had abnormal X-rays. Family surveys lead to picking up of nine children who had radiological evidence of the disease. Lymphnode biopsy in one of the subjects showed tuberculous lymphadenitis. How relevant this index of tuberculin conversion is as an indicator of tuberculous disease in childhood is clear from the present study. It is an important procedure for screening and can considerably reduce the work load and increase case yield. It also gives us a good idea about the prevalence and epidemiology of tuberculous infection in children.

Introduction

A preliminary tuberculin test is an important screening procedure. Epidemiological data concerning tuberculous infection is very meagre in our country inspite of a few surveys (Palmer, 1952; Sahni, 1942; Taylor, 1944; Ukil, 1930). Tuberculin conversion is an index of prevalence of tuberculosis and has been studied by different authors.

Material and methods

Children up to the age of 5 years attending the paediatric out-patient Department of Safdarjang Hospital formed the subject of study. Children under the age of 3 months were not included in the study because of the time lag in Mantoux conversion, rendering the test fallacious. A detailed history with special reference to past history of measles, pertussis and a family history of tuberculosis was taken. A detailed physical examination was done in each case making a specific note of the presence or otherwise of the BCG vaccination scar.

TABLE 1: Mantoux Test Induration in mm

	0-9	10-15	16-20	21-25	26-30
3 months					
— 1 yrs 335	4	1	—	—	—
— 2 yrs 270	3	4	1	1	1
— 3 yrs 190	11	6	4	2	
— 4 yrs 140	6	4	4	1	
— 5 yrs 137	6	12	2	2	
	1072	30	27	11	6

All the children were given 0.1ml PPD containing RT 23 with 0.005% of tween 80, prepared at the BCG Vaccine Laboratory, Madras. A fresh bottle of PPD was used on each working day.

A Public Health Nurse who was specially trained in the technique of doing the Mantoux test, assisted in the study.

The results were noted independently and cross checked for accuracy at random. An induration of 10 mm or above was considered positive in the light of our own experience and keeping in view the views of several other workers (Arcanson, 1934; Johnston et al., 1965; Raj Narain et al., 1963; Ayman, 1934; Hunt, 1939). The children with a positive tuberculin test were investigated for evidence of tuberculosis.

Result

1146 children between the age of 3 months and 5 years were studied. 760 were males and 386 were females. The size of induration is given in Table 1. 74 children had an induration of 10 mm or above and was considered positive.

In 30 children the induration measured between 10 mm and 15 mm while in the rest it was more than 15 mm (Table 1). 12 children out of this group did not report for further investigations and hence the detailed analysis is comprised of 62 children only. All these children belonged to Class III-IV of ICMR Classification. 82% were below 50th percentile of ICMR reference standard of weight. A similar number had a Hemoglobin value of less than 10 gm%.

All the 62 children presented at the hospital with one or other symptom such as fever, cough, loss of appetite etc. but the symptoms were considered suggestive of a tubercular etiology only if the duration was one month or more. This was not present in any one of them.

A family history of tuberculosis was elicited in 13 children. Father was the contact in 4 cases, mother in 5, brother in 1, sister in 2, and a cousin in 1 case.

Skiagrams of chest were abnormal in 27 children. The analysis is shown in Table 2.

TABLE 2

1. Glandular enlargement		
(a) Paratracheal	— 9	14
(b) Hilar	— 5	
2. Parenchymatous lesions		
(a) Miliary	— 1	10
(b) Broncho-Pneumonic	— 3	
(c) Consolidation	— 6	

- | | |
|---------------------------------|---|
| 3. Glandular and Parenchymatous | 3 |
| 4. Consolidation | 3 |

One child showed lytic lesion of the humerus as well as of the phalanges.

Gastric lavage was positive for AFB in two cases and gland biopsy showed tuberculous lymphadenitis in one case out of 5 where it was done although clinically glands were not significantly enlarged in this case.

FAMILY SURVEY

A family survey was done in all the 62 children. X-ray chest was done on all the members of the family above the age of 12 and a Mantoux test was done in all members below that age. All the Mantoux positive children were subjected to X-ray of the chest. In 9 children radiological examination confirmed the presence of a contact. In one family X-ray of both the parents were normal but 4 out of 5 sibs aged 1½, 3, 4 and 5 each had positive Mantoux test. Radiological examination was normal in these children.

Comments

There are many factors besides a typical myco-bacteria which influence the outcome of the tuberculin reaction for example malnutrition, INH therapy, infectious diseases like chickenpox, measles and paralytic poliomyelitis, during incubation period of tuberculosis, corticosteroid and methotrexate therapy, hypothyroidism,

Hodgkin Disease, and sarcoidosis and the site of previous tuberculin test.

The Mantoux conversion in children under 5 years was 7% in this study. The incidence of the positivity in the literature by different authors varied according to different criteria for positivity. Thus Basu et al. (1959) has reported the incidence to be 18.8% and 26.6% respectively. However, Flynn and Joyce's (1954) incidence was only 2.1%. The study of Minto (1957) confirmed with the present study.

History of contact with a patient of tuberculosis was available in 20.9% of cases, Shah and Taylor (1958) reported the history of contact in 13.97% in the reactor group and 11.22% in the non-reactor group, the mean being 11.16%.

The usefulness of the tuberculin sensitivity in children as an index of tuberculosis was evaluated in terms of the conversion index. Out of 62 children, 27 had abnormal X-rays. Family surveys further identified nine children who had radiological evidence of disease. Lymphnode biopsy in one of the subjects showed tuberculous lymphadenitis. How relevant this index of tuberculin conversion is as an indicator of tuberculous disease in childhood is clear from the present study. It is an important procedure for screening and a good indicator of the prevalence and epidemiology of tuberculous infection in children. The limitations of false negative test as mentioned earlier have to be kept in mind while assessing a child.

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