RESEARCH BRIEF

Significance of Family Survey of Index Case for Detection of Tuberculosis

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Tuberculosis is highly prevalent amongst children in India. Contact survey has not received much attention in the Revised National Tuberculosis Control Program guidelines. This study was conducted to look for tuberculosis in asymptomatic family members of pediatric tuberculosis patients at a government hospital attached to a medical college in Central India. 168 siblings and 162 parents of 86 index cases of tuberculosis were studied. 64 tuberculosis infected siblings and 7 sputum positive parents were identified.

Key words: *Contact survey, Index case, Tuberculin Skin Testing (TST), Tuberculosis.*

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In 1993, WHO declared tuberculosis as to be global public health problem. 1.8 million new tuberculosis cases occur every year in India and 0.8 million of these are infectious sputum positive cases [1]. Of the total TB case load, around 10% are found amongst children according to estimates, amounting to 1.5 million new cases and 1.30 lakh deaths due to TB every year [2]. According to the pyramid of childhood tuberculosis, those with serious disease constitute only the apex of the problem and are admitted in hospitals [3]. Bacteriogical confirmation of tuberculosis is difficult in children due to paucibacilliary nature of the disease. The importance of case contact investigation cannot be overemphasized as up to 50% of children are diagnosed as a result of contact investigation [4,5]. RNTCP guidelines at present do not recommend ascending, descending and horizontal survey of tuberculosis patients. This study has been carried out to find evidence of tuberculsis in asymptomatic family members of pediatric tuberculosis patients.

METHODS

This was a prospective hospital based study conducted in a total of 168 siblings of 86 index cases admitted in the Department of Pediatrics at our institution from August 2007 to July 2008. Siblings of the index case between age group 1month to 12 years were enrolled. Exclusion criteria included siblings previously treated for tubercular infection or disease; those with medical condition like HIV infection, hematological or reticuloendothelial system malignancy; and those who were previously or currently on immuno-suppressive drugs. Parents of index cases were also included to detect tuberculous infection but the data is not presented here. Index cases were diagnosed on the basis of history, general and systemic clinical examination, and investigations including *X*-ray chest. Sputum examination of their parents was done for detection of acid fast bacilli by trained personnel at the DOTS center in the hospital. Siblings were subjected to detailed history regarding history of fever and/or cough, weight loss, loss of appetite, previous history of infectious disease (measles and pertussis), immunization status, history of contact with a case of tuberculosis and history regarding housing condition and education of parents. Detailed general and systematic examination was

WHAT THIS STUDY ADDS?

- Family surveys are important in early detection of hidden tuberculosis.

done. Tuberculin skin testing (TST) was performed by intradermal injection of 0.1 mL of 1 TU of PPD into the volar surface of left forearm and was read 48 to 72 hours later. Induration was measured in mm by Pen method and read as negative <5 mm, doubtful ≥5-10mm and positive >10mm. *X*-ray chest PA view of all children was taken and additional investigations were done if required. All proportions were compared by Chi-square test. The level of significance for all tests was 0.05. Analysis was conducted using the SPSS version 10.0 software.

RESULTS

Of the 86 index cases, 60% were <5 year of age, male to female ratio was 1.09:1, 44% had severe grade malnutrition (III and IV) and only 8% had normal nutrition. The commonest form of tuberculosis between age 1month and 12 years was pulmonary tuberculosis (40%). Disseminated tuberculosis was most common under 5 years of age: pulmonary tuberculosis (*n*=22), tubercular meningitis (*n*=18) and military tuberculosis (*n*=7).

Out of 168 siblings, 30% had severe malnutrition, 55% had no BCG scar and 39.2% had history of contact. 32 (19.0%) had positive tuberculin reaction and 62 (36.9%) had induration between ≥5–10 mm. Amongst those having induration ≥5–10 mm, 18 (out of 62) had risk factors making TST positive. Thus 50 siblings were diagnosed with hidden tubercular infection by TST, 23 out of these had tubercular disease. The total number of siblings infected with tuberculosis were 64 (***Table* I**). Among 162 parents, 7 (4.3%) parents were newly detected as sputum positive and 20 (12.3%) parents had *X*-ray chest suggestive of healed or active tuberculosis.

DISCUSSION

In this study, family survey of 168 siblings and 162 parents of 86 index cases of tuberculosis has resulted in detection of tuberculosis in 64 siblings and 27 parents. Severe disease like tubercular meningitis and disseminated tuberculosis were common in under 5 years index cases. Benakappa, *et al*. [6] had also reported nearly same incidence of tubercular meningitis. As positive TST indicates tubercular infection, in our study 32 (29.7%) siblings were found to be having tubercular infection on the basis of TST. Tuberculin positivity of our study (29.7%) is also comparable to previous studies [7-9]. We conclude that history of contact is very important in diagnosis of childhood tuberculosis. Earlier studies have also noted history of contact in 37-55% cases [7-11].

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TABLE I DISTRIBUTION OF SIBLINGS WITH POSITIVE TUBERCULAR REACTION AND CHEST X-RAY

	Severe Malnutrition			BCG Scar		
	Present *n*=51	Absent *n*=117	*P* value	Present *n*=76	Absent *n*=92	*P* value
Positive tubercular skin test (*n*=32)	11	21	0.58	12	20	0.36
Positive chest *X*-ray (*n*=19)	11	8	0.006	4	15	0.025
Both positive (*n*=13)	9	4	0.002	1	12	0.005

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