

## ORIGINAL ARTICLE

### Analysis of clinical profile of children with pulmonary tuberculosis

Nirupama Tyagi

Assistant Professor, Department of Paediatrics, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

#### ABSTRACT:

**Background:** To evaluate the clinical profile of children with pulmonary tuberculosis. **Material and method:** A total of 200 patients were enrolled in the current research. Inclusion criteria in the present study included subjects within the age range of 5 to 15 years who were admitted with confirmed sputum based and radiographic diagnosis of pulmonary tuberculosis. Complete demographic and clinical details of all the patients was obtained. A comprehensive clinical file was kept, including the history of the patient and any contacts, the physical examination, TST, CXR, sputum smear microscopy, and culture. Smear, culture, or both positive bacteriology cases were classified as tuberculosis (TB). **Results:** Weight loss, anorexia, fatigue and fever were found to be present in 74.5 percent, 79.5 percent, 56 percent and 91 percent of the patients respectively. Cough and pallor were seen in 79.5 percent and 60.5 percent of the patients respectively. Dyspnoea was seen in 44.5 percent of the patients while haemoptysis was seen in 19.5 percent of the patients. Non-significant results were obtained while correlating the clinical profile among with age and gender. **Conclusion:** Our results emphasize the necessity of TB screening for children hospitalized with severe pneumonia or respiratory illness.

**Key words:** Pediatrics, tuberculosis, sputum, pulmonary.

**Corresponding author:** Nirupama Tyagi, Assistant Professor, Department of Paediatrics, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

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#### INTRODUCTION

Tuberculosis (TB) is a major cause of disease, both pulmonary and extrapulmonary, and death in children from TB-endemic areas (Bates et al. 2013; Graham et al. 2014), but is also seen in nonendemic areas because of increased international travel, population migration, and refugee resettlement. Although overdiagnosis does occur in some settings, underdiagnosis is the rule in most TB-endemic areas, where young children can only access TB care via referral hospitals. According to the most recent estimates, nearly 1 million children develop TB every year (Jenkins et al. 2014); this is nearly double World Health Organization (WHO) estimates of 530,000 cases for 2012, causing 74,000 deaths, which exclude deaths in human immunodeficiency virus (HIV)-infected children (World Health Organization 2013).<sup>1-4</sup>

The global burden of childhood TB is under-reported due to paucibacillary disease which makes diagnosis by sputum smear microscopy and culture difficult. In 2007, the World Health Organization (WHO) showed that smear-positive TB in children (<14 years of age) accounted for 0.6–3.6% of reported cases. These data underestimate the true burden of pediatric TB since incidence is estimated using smear-positive cases. The majority of cases in children less than 12 years of age are smear-negative, and smears are seldom performed in high-burden countries. In low-burden countries, childhood TB constitutes about 5% of TB cases compared to the 20–40% in high-burden countries.<sup>5-8</sup> Hence this study was undertaken to assess the clinical profile of children with pulmonary tuberculosis.

#### MATERIAL AND METHOD

This study was undertaken to assess the clinical profile of children with pulmonary tuberculosis. A total of 200 patients were enrolled in the current research. Inclusion criteria in the present study included subjects within the age range of 5 to 15 years who were admitted with confirmed sputum based and radiographic diagnosis of pulmonary tuberculosis. Complete demographic and clinical details of all the patients was obtained. A comprehensive clinical file was kept, including the history of the patient and any contacts, the physical examination, TST, CXR, sputum smear microscopy, and culture. Smear, culture, or both positive bacteriology cases were classified as tuberculosis (TB). The Microsoft Excel sheets contained the complete set of data. The statistical analysis was done using SPSS software.

#### RESULTS

Majority proportion of patients belonged to the age group of 13 to 15 years followed by 5 to 7 years. 60.5 percent of the patients were males while the remaining were females. Weight loss, anorexia, fatigue and fever were found to be present in 74.5 percent, 79.5 percent, 56 percent and 91 percent of the patients respectively. Cough and pallor were seen in 79.5 percent and 60.5 percent of the patients respectively. Dyspnoea was seen in 44.5 percent of the patients while haemoptysis was seen in 19.5 percent of the patients. Non-significant results were obtained while correlating the clinical profile among with age and gender.

**Table 1: Demographic details**

Parameter		Number of patients	Percentage
Age group (years)	5 to 7	52	26
	8 to 12	69	34.5
	13 to 15	79	39.5
Gender	Males	121	60.5
	Females	79	39.5

**Table 2: Clinical profile**

Clinical profile	Number	Percentage
Edema	20	10
Diarrhoea	24	12
Nausea/vomiting	58	29
Dyspnoea	89	44.5
Headache	41	20.5
Haemoptysis	39	19.5
Cough	159	79.5
Pallor	121	60.5
Weight loss	149	74.5
Anorexia	159	79.5
Fatigue	112	56
Fever	182	91

## DISCUSSION

TB is no longer the scourge it once was, but it remains an important cause of morbidity and mortality worldwide. Fueled by increasing poverty, homelessness, immigration, drug abuse, declining prevention programs, and the HIV epidemic, its incidence in the United States has increased dramatically. The complex natural history of pulmonary TB in children is reflected in its varied radiographic manifestations. Strict distinction between "adult" and "childhood" patterns of TB should be avoided. In general, adenopathy is the footprint of childhood primary pulmonary TB, with or without a readily apparent primary parenchymal focus or pleural effusion. Infants and young children are more likely to present with adenopathy only than their older counterparts. The pediatric tracheobronchial tree is particularly susceptible to compression by surrounding nodes, producing segmental atelectasis, or less commonly, obstructive emphysema. Self-limited lymphohematogenous dissemination is the rule, but actual miliary disease is the exception. Tuberculosis in children has unique features, different from adults, which make the diagnosis more difficult. The symptoms of TB in children have a broad spectrum changing from non-specific symptoms to severe clinical presentations. Although pulmonary involvement is frequent, all organs can be involved. Almost every child in western countries has *Bacillus Calmette–Guérin* (BCG) vaccination at least once, thus the tuberculin skin test (TST) has limited benefit at diagnosis. Although previous studies suggested whole-blood interferon-gamma release assays (IGRAs) for confirmation of exposure in TST positive children, discrimination of latent and active TB disease could not be done based

on this test as the value of the test have not been well studied in young children and infants.<sup>9-11</sup>

Majority proportion of patients belonged to the age group of 13 to 15 years followed by 5 to 7 years. 60.5 percent of the patients were males while the remaining were females. Weight loss, anorexia, fatigue and fever were found to be present in 74.5 percent, 79.5 percent, 56 percent and 91 percent of the patients respectively. Cough and pallor were seen in 79.5 percent and 60.5 percent of the patients respectively. Dyspnoea was seen in 44.5 percent of the patients while haemoptysis was seen in 19.5 percent of the patients. Non-significant results were obtained while correlating the clinical profile among with age and gender. Nantongo JMet al conducted a study to establish the burden of pulmonary TB in children admitted with severe pneumonia in their setting. Children with a previous TB diagnosis or receiving anti-TB treatment were excluded. Each child was screened for TB using Tuberculin skin test, Chest X-ray, induced sputum samples and blood culture for mycobacterium. Sputum smears were examined using fluorescent microscopy, and cultured on both Lowenstein Jensen media (LJ) and Mycobacterial Growth Indicator Tubes (MGIT). Of the 270 children with severe pneumonia who were recruited over a 5-month period in 2011, the incidence ratio of pulmonary TB in children admitted with severe pneumonia was 18.9% (95% CI 14.6 – 23.9). The proportion of culture confirmed PTB was 6.3% (95% CI 3.8 – 9.7). Age group under 1 year and 1 to 5 years (OR 2.8 (95% CI 1.7 – 7.4) and OR 2.4 (95% CI 1.05 – 5.9) respectively) were more likely to be associated with pulmonary TB compared to those children over 5 years of age. A history of TB smear positive contact was associated with pulmonary

TB.<sup>10</sup>González Saldaña N et al assessed PTB in the population of children in terms of its diagnosis and treatment in a third level pediatric hospital. Definitive diagnosis was based on positive acid-fast bacilli (AFB) or culture. 87 children were diagnosed with PTB; 57 (65.5%) had bacteriologic confirmation with ZN staining or culture positive (in fact, 22 were ZN and culture positive), and 30 (34.5%) had a probable diagnosis; 14 (16.1%) were diagnosed with concomitant disease, while 69/81 were immunized. Median evolution time was 21 days (5–150). Fever was found in 94.3%, cough in 77%, and weight loss in 55.2%. History of contact with TB was established in 41.9%. Chest X-ray showed consolidation in 48.3% and mediastinal lymph node in 47.1%. PPD was positive in 59.2%, while positive AFB was found in 51.7% cases. Culture was positive in 24/79 patients (30.4%), PCR in 20/27 (74.1%). 39 (44.8%) patients were treated with rifampin, isoniazid, and pyrazinamide while 6 (6.9%) received the former drugs plus streptomycin and 42 (48.3%) the former plus ethambutol. There were three deaths. PTB in pediatric population represents a diagnostic challenge for the fact that clinical manifestations are unspecific and the diagnosis is not confirmed in all cases; that is why clinical suspicion, X-ray findings and PPD are indispensable for opportune start of treatment.<sup>11</sup>The risk of acquisition of TB following primary infection is high in very young children (< 5 y) and in the adolescent population. Thus, patients in these age groups with a positive TST especially when they are in close contact with a smear positive PTB and no other clinical manifestations should receive INH prophylaxis. Active TB should be excluded before the initiation of preventive therapy. Adults with a positive TST and no other clinical or radiographic manifestations who are receiving INH therapy have been reported to have 54–88% protection against the development of infection to the disease, whereas children have been shown to have 100% protection. When you are faced with MDR-TB (Multiple drug resistance), observation is recommended, because these drugs are not effective for this kind of infection. Several drugs have been tried in these circumstances, including PZA, fluoroquinolones, and ETB, depending on the susceptibility patterns. For recent contacts of patients with contagious TB (in the last 3 months), INH therapy is indicated even if the TST result is negative. This is especially true for contacts who are infected with HIV or for household contacts younger than 5 years.<sup>11-14</sup>

## CONCLUSION

Our results emphasize the necessity of TB screening for children hospitalized with severe pneumonia or respiratory illness.

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