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Original Research Article

Clinical Assessment of Pediatric Cases Suffered From pulmonary tuberculosis

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Abstract:

The proportion is higher in high TB-burden countries, reflecting that childhood TB represents active TB transmission within a community. Similar to other high burden countries, India faces challenges in capturing childhood TB cases to be treated under the National TB program (NTP). Despite implementation of directly observed treatment short course (DOTS) program in public and private hospitals in India since 2000, the burden of childhood TB in hospitals seems to be increasing. Hence the present study was planned to Clinical Assessment of Pediatric Cases Suffered From pulmonary tuberculosis

Methodology

The present study was planned in the Department of Paediatrics. Total 50 cases of the Tuberculosis patients of the age 0 – 14 years were enrolled in the present study. All patients undergoes the chest X-ray for the knowing the radiographic findings. A detailed clinical history, family history of contact with TB disease, and physical examination for each child was recorded in a standardized format.

The prevalence of childhood TB is still very high and not decreasing even after implementation of the DOTS for more than 10 years. Hence it is recommended that all the patient coming with fever, not gaining weight, anorexia and with no obvious diagnosis should not be given therapeutic trials and tuberculosis should be considered as an important differential. All such cases should be referred to DOTS centre and should be properly investigated to break the rise of this neglected epidemic.

Keywords: pulmonary tuberculosis, Pediatric Cases, TB, Childs, etc.

Introduction:

Tuberculosis (TB) is an infectious disease usually caused by Mycobacterium tuberculosis (MTB) bacteria. Tuberculosis generally affects the lungs, but can also affect other parts of the body. Most infections do not have symptoms, in which case it is known as latent tuberculosis. About 10% of latent infections progress to active disease which, if left untreated, kills about half of those affected. The classic symptoms of active TB are a chronic cough with blood-containing sputum, fever, night sweats, and weight loss. It was historically called "consumption" due to the weight loss. Infection of other organs can cause a wide range of symptoms.[1]

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Tuberculosis is spread through the air when people who have active TB in their lungs cough, spit, speak, or sneeze. People with latent TB do not spread the disease. Active infection occurs more often in people with HIV/AIDS and in those who smoke. Diagnosis of active TB is based on chest X-rays, as well as microscopic examination and culture of body fluids. Diagnosis of latent TB relies on the tuberculin skin test (TST) or blood tests.[2]

Prevention of TB involves screening those at high risk, early detection and treatment of cases, and vaccination with the bacillus Calmette-Guérin (BCG) vaccine. Those at high risk include household, workplace, and social contacts of people with active TB. Treatment requires the use of multiple antibiotics over a long period of time. Antibiotic resistance is a growing problem with increasing rates of multiple drug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB).[1]

Presently, one-quarter of the world's population is thought to be infected with TB. New infections occur in about 1% of the population each year. In 2017, there were more than 10 million cases of active TB which resulted in 1.6 million deaths. This makes it the number one cause of death from an infectious disease. More than 95% of deaths occurred in developing countries, and more than 50% in India, China, Indonesia, Pakistan, and the Philippines. The number of new cases each year has decreased since 2000.[1] About 80% of people in many Asian and African countries test positive while 5–10% of people in the United States population test positive by the tuberculin test. Tuberculosis has been present in humans since ancient times.[3]

If a tuberculosis infection does become active, it most commonly involves the lungs (in about 90% of cases). Symptoms may include chest pain and a prolonged cough producing sputum. About 25% of people may not have any symptoms (i.e. they remain "asymptomatic"). Occasionally, people may cough up blood in small amounts, and in very rare cases, the infection may erode into the pulmonary artery or a Rasmussen's aneurysm, resulting in massive bleeding. Tuberculosis may become a chronic illness and cause extensive scarring in the upper lobes of the lungs. The upper lung lobes are more frequently affected by tuberculosis than the lower ones. The reason for this difference is not clear. It may be due to either better air flow, or poor lymph drainage within the upper lungs.[4]

Progression from TB infection to overt TB disease occurs when the bacilli overcome the immune system defenses and begin to multiply. In primary TB disease (some 1–5% of cases), this occurs soon after the initial infection. However, in the majority of cases, a latent infection occurs with no obvious symptoms. These dormant bacilli produce active tuberculosis in 5–10% of these latent cases, often many years after infection.[5]

The risk of reactivation increases with immunosuppression, such as that caused by infection with HIV. In people co infected with M. tuberculosis and HIV, the risk of reactivation increases to 10% per year. Studies using DNA fingerprinting of M. tuberculosis strains have shown reinfection contributes more substantially to recurrent TB than previously thought, with estimates that it might account for more than 50% of reactivated cases in areas where TB is common. The chance of death from a case of tuberculosis is about 4% as of 2008, down from 8% in 1995.[6]

Over 250,000 children develop TB and 100,000 children will continue to die each year from TB. A child usually gets TB infection from being exposed to a sputum-positive adult. Young children below ten years of age are at risk of becoming infected with TB bacilli. They are also at high risk of developing active tuberculosis because the immune system of young children is less developed. The

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chance of developing TB disease is greatest shortly after infection. When children present with active tuberculosis disease their family members and other close contacts should be investigated for TB to find the source of the disease and treat them as necessary. In HIV infected children the risk of developing TB meningitis is very high and often result in deafness, blindness, paralysis and mental retardation. Tuberculosis and malnutrition often go together, and a child with TB disease may present as failure to gain weight with loss of energy and a cough lasting for more than three weeks.

The diagnosis of tuberculosis in children can be difficult because children under the age of 10 years usually cannot cough up enough sputum to be sent for laboratory investigations to confirm the infection of tuberculosis. The diagnosis is thus largely based on the clinical features of cough, weight loss, with a history of close contact with an infectious adult TB patient. With increasing coverage of BCG vaccination, the tuberculin skin test is no longer considered a confirmatory test. Chest X-rays of children are difficult to interpret as the typical shadow is rarely seen. [7]

Childhood tuberculosis has been described as neglected disease despite being public health problem as this may constitute 5 to 20% of total TB case load in many high incidence countries. [8] In India it is estimated that 6 to 8 % of all new TB cases are in pediatric age group. [9] Childhood TB is neglected because in children it usually either extra pulmonary or pulmonary smear negative which is difficult to suspect and diagnose in children. [10] In view of wide range of clinical spectrum of childhood TB, diagnosis is often difficult and high index of suspicion is required. To address this problem Revised National Tuberculosis Control Program (RNTCP) in consultation with Indian Association of Pediatrics issued guidelines for diagnosis of childhood TB and introduced patient wise boxes for pediatric TB patients.[10]

The proportion is higher in high TB-burden countries, reflecting that childhood TB represents active TB transmission within a community. Similar to other high burden countries, India faces challenges in capturing childhood TB cases to be treated under the National TB program (NTP). Despite implementation of directly observed treatment short course (DOTS) program in public and private hospitals in India since 2000, the burden of childhood TB in hospitals seems to be increasing. Hence the present study was planned to Clinical Evaluation of Pediatric Cases Suffered From pulmonary tuberculosis Admitted to Darbhanga Medical College and Hospital.

Methodology:

The present study was planned in the department of Pediatrics ,ICARE Institute of Medical Science and Research and Dr Bidhan Chandra Roy Hospital, Haldia, West Bengal, India for one year. Total 50 cases of the Tuberculosis patients of the age 0 – 14 years were enrolled in the present study. All patients undergoes the chest X-ray for the knowing the radiographic findings. A detailed clinical history, family history of contact with TB disease, and physical examination for each child was recorded in a standardized format.

A chest X-ray PA was taken for all children and a lymph node biopsy was performed in those who had significantly enlarged superficial (cervical or axillary) lymph nodes. Mantoux test was done with 1 TU PPD RT23 with Tween 80 and the size of induration recorded after 48-72 hours by trained readers. Sputum specimens were collected wherever possible in cooperative children. Gastric lavage was performed as an out patient procedure by trained field investigators on two consecutive days, early in the morning on an empty stomach.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them.

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Following was the inclusion and exclusion criteria for the present study.

Inclusion Criteria: All newly diagnosed cases of Tuberculosis from 0-14 years of age. Those children who were already diagnosed with TB and on DOTS but presenting with relapse, treatment failure and defaulter.

Exclusion Criteria: Children with Tuberculosis already on antitubercular treatment were excluded from the study.

Results & Discussion:

TB in children poses major challenges in diagnosis, a collection of epidemiological data, and serious implications in children <5 years by affecting their growth potential and associated significant morbidity [8-10]. Diagnosis of TB in children presents special problems as the sputum is generally not available for examination. Diagnostic algorithms include scoring system utilizing clinical parameters and results of investigations.

Table 1: Clinical Profile of the childrens

Parameters	**No. of Cases**
Gender:	
Males	21
Females	18
Age:	
0 – 5 years	22
6 – 10 years	19
11 – 14 years	9
Socioeconomic Class:	
Low	25
Middle	12
High	13
Total Cases	**50**
Fever	43
Cough	34
Loss of appetite	22
Respiratory distress	3
Chest pain	3
Hemoglobin (g/dl)	9.2 – 12.7
Platelet count (10^5 /cumm)	2.3 – 5.4
ESR (mm at end of I hour)	21.9 – 42.3
White cell count (10^3/cumm)	8.5 – 15.4
Lymphocyte	36.1 – 49.4
Pulmonary Smear Positive	50
Pulmonary Smear Negative	0

Table 2: Chest radiograph findings

Findings	No. of Cases
Consolidation	13
Nonspecific finding	7

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Pleural effusion	6
Hilar lymphadenopathy	8
Hazy densities	4
Pericardial effusion	5
Milliary mottling	4
Cavitation	2
Atelectasis	1
Total	50

Consistent with the findings from other studies [15-19], more than half of childhood TB cases occurred in the age group of 0–5 years (i.e., 58% in the inpatient). High incidence of TB among children under 5 years of age indicates ongoing disease transmission in the household [11]. This can be prevented with the provision of isoniazid prophylaxis therapy (IPT) in approximately 60% of at-risk individuals [12]. According to the WHO recommendation, IPT should be given for 6 months to children aged <6 years who are household contacts of infectious cases [13]. In India, however, contact tracing and provision of TB prophylaxis to high-risk children are still difficult because of the non-acceptance by the family members due to social stigma and fear associated with the disease in illiterate and low socioeconomic group.

History of contact with patients of active tuberculosis was reported in total 18.2% cases in study done at Sangli, India [15]. Only 23.5% patients had positive history of contact in study from Nepal [16]. Similarly a history of contact with tuberculosis was given by only 13.1% relatives in north Indian study [17]. Children acquire TB infection from the adults with TB as in children pauci-bacillary TB is common and poor tussive force. Contact history of TB is seldom positive; this could be due to family members not giving true history due to the social stigma attached to this disease. So although mention facts questions the role of history of contact with T.B. as tool for diagnosing tuberculosis but still we consider as important aspect especially in cases of less than 15 years old.

An Indian study by Kabra et al. from a tertiary care referral center in North India suggests an increase in the proportion of cases of extra pulmonary TB over the past three decades [14]. The increase was predominantly due to increase in lymph node TB. The severe form of tubercular meningitis decreased over the past three decades. The community-based studies also had a low prevalence of neuro TB.

With the current demographic transition and increasing life expectancy in low- and middle-income countries, the proportion of young person's is increasing, and the incidence of TB among them is expected to increase. Thus, failure of early identification and management of TB in the youth can present major challenges for a TB control programme– perpetuating the chain of transmission in the community. [18]

The present study provides data that is representative of a patient population attending outpatient pediatric clinics of urban hospitals. The strengths of the study are its multicentric nature, comprehensive investigations including mycobacterial culture and drug susceptibility testing and the large number of children screened. Limitations include differences in referral patterns at the various hospitals and lack of data on outcomes after treatment completion.

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Conclusion:

The prevalence of childhood TB is still very high and not decreasing even after implementation of the DOTS for more than 10 years. Hence it is recommended that all the patient coming with fever, not gaining weight, anorexia and with no obvious diagnosis should not be given therapeutic trials and tuberculosis should be considered as an important differential. All such cases should be referred to DOTS centre and should be properly investigated to break the rise of this neglected epidemic.

References:

1. "Tuberculosis Fact sheet N°104". WHO. October 2015. Archived from the original on 23 August 2012. Retrieved 11 February 2016.
2. Konstantinos A (2010). "Testing for tuberculosis". Australian Prescriber. 33 (1): 12–18. doi:10.18773/austprescr.2010.005. Archived from the original on 4 August 2010.
3. Lawn SD, Zumla AI (July 2011). "Tuberculosis". Lancet. 378 (9785): 57–72. doi:10.1016/S0140-6736(10)62173-3. PMID 21420161.
4. Dolin, [edited by] Gerald L. Mandell, John E. Bennett, Raphael (2010). Mandell, Douglas, and Bennett's principles and practice of infectious diseases (7th ed.). Philadelphia, PA: Churchill Livingstone/Elsevier. p. Chapter 250. ISBN 978-0-443-06839-3.
5. Gibson, Peter G. (ed.); Abramson, Michael (ed.); Wood-Baker, Richard (ed.); Volmink, Jimmy (ed.); Hensley, Michael (ed.); Costabel, Ulrich (ed.) (2005). Evidence-Based Respiratory Medicine (1st ed.). BMJ Books. p. 321. ISBN 978-0-7279-1605-1. Archived from the original on 8 December 2015.
6. Lawn SD, Zumla AI (July 2011). "Tuberculosis". Lancet. 378 (9785): 57–72. doi:10.1016/S0140-6736(10)62173-3. PMID 21420161.
7. http://www.searo.who.int/tb/topics/tb_children/en/
8. A research Agenda for Childhood Tuberculosis. WHO/HTM/TB/2007.381.Available from:URL:http://whqlibdoc.who.int/hq/2007/WHO_HTM_TB_2007.381_eng.pdf. Accessed on 30/3/2013
9. TB India 2007 RNTCP status report. Central TB Division, Directorate General of Health Services, New Delhi 2008; p.32
10. Guidelines for use of Pediatric Patient Wise boxes under the Revised National Tuberculosis Control Programme. Available from http://www.tbcindia.org/pdfs/Pediatric Guidelines Final.pdf, Accessed on 4/4/2013.
11. Marais BJ, Gie RP, Schaaf HS, Hesseling AC, Obihara CC, Starke JJ, et al. The natural history of childhood intra-thoracic tuberculosis: A critical review of literature from the pre-chemotherapy era. Int J Tuberc Lung Dis 2004;8:392-402.
12. Smieja MJ, Marchetti CA, Cook DJ, Smaill FM. Isoniazid for preventing tuberculosis in non-HIV infected persons. Cochrane Database Syst Rev 2000;2:CD001363.
13. Aissa K, Madhi F, Ronsin N, Delarocque F, Lecuyer A, Decludt B, et al.Evaluation of a model for efficient screening of tuberculosis contact subjects. Am J Respir Crit Care Med 2008;177:1041-7.
14. Kabra SK, Lodha R, Seth V. Tuberculosis in children-What has changed in last 20 years? Indian J Pediatr 2002;69 Suppl 1:S5-10
15. Dhobale RV, Kadam YR, Dhumale GB, Dhanawade SS, Gore AD, et al. Clinical Profile of Pediatric Tuberculosis Patients at Bharati Hospital, Sangli. IJMAR, 2012; 1(1): 25 - 30.

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16. Sreeramareddy CT, Ramakrishnareddy N, Shah RK, Baniya R, Swain PK, et al. Clinico-epidemiological profile and diagnostic procedures of pediatric tuberculosis in a tertiary care hospital of western Nepal-a case-series analysis. BMC Pediatrics, 2010; 10: 57

17. Garg P. Childhood Tuberculosis In A Community Hospital From A Region Of High Environmental Exposure In North India. Journal of Clinical and Diagnostic Research, Feb 2008; 2: 634-638.

18. Wang CS, Chen HC, Yang CJ, Wang WY, Chong IW, et al. (2008) The impact of age on the demographic, clinical, radiographic characteristics and treatment outcomes of pulmonary tuberculosis patients in Taiwan. Infection 236:335–340.