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Research Article

**STUDY TO DETERMINE THE CHILDHOOD RESPIRATORY
TUBERCULOSIS IN PAKISTAN**¹Dr Javeria Bukhari, ²Dr Kinza Khan Babar, ³Dr Abeera Abdul Ghaffar
^{1,2,3}Nishter Medical College, Multan

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Abstract:*Aim: To estimate the bacterio-epidemiological situation of childhood respiratory tuberculosis in Pakistan.**Place and Duration: In the Department of Community medicine and Pediatric department of Nishter Hospital Multan for one-year duration from February 2019 to February 2020.**Methods: 2185 symptomatic patients of 0-14 years old were studied. Among 110 bacteriologically confirmed cases, 60% were less than five years old and the number of females was slightly more than males.**Results and Conclusion: In 21 % of patients, the Mantoux test was negative. None of the miliary cases had a history of BCG vaccination. In 54.6% of patients less than two years old, one of the family members was suffering from infectious tuberculosis. Clinical findings were fever, cough, weight loss and respiratory distress respectively. Radiological findings were mostly pneumonia or bronchopneumonia-like infiltrations and in 44% of cases were found in the right lung. Mycobacterium tuberculosis strains in 11.7% of patients were resistant to isoniazid or streptomycin.**Key words: respiratory tuberculosis, pneumonia, Clinical findings, bacterio-epidemiological situation.***Corresponding author:****Dr. Javeria Bukhari,**
Nishter Medical College, Multan.

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INTRODUCTION:

Although introduction of modern anti-tuberculous agents, better understanding of pathogenesis and immunology of the disease and improvement of socioeconomic situation have led to a decline in the incidence of tuberculosis in developed countries, it is still regarded a major world health problem, especially in the developing countries. It has been estimated that in developing countries 10 million persons each year develop tuberculosis, with 4-5 million highly infectious cases of smear positive tuberculosis and at least three million die from the disease. Cost in terms of human suffering, disability and socio-economic loss is immeasurable. In any campaign against the disease, childhood tuberculosis should not be overlooked, since primary infection usually occurs in the lung and early in life, especially in developing countries. Although primary infection is usually self-limiting, but under close observation in a well-nourished population in England, one-third of 99 children under five years of age showed recognizable illness at the time or immediately after primary tuberculous infection. If the incidence of intercurrent infection is greater and the standard of nutrition lower, the incidence of symptoms might be much greater. Primary tuberculous infection may sometimes progress to pulmonary tuberculosis indistinguishable from that of young adults. One hundred twenty-nine children aged 7-15 years old from a total of 1200 studied in a children's hospital for tuberculosis from 1948 to 1960 had adult type disease. In a small proportion of those infected, hematogenous spread of bacilli may occur and lead to meningitis or miliary tuberculosis which are severe and progressive, and before introduction of chemotherapy, were often fatal. This gives the study of childhood tuberculosis a special significance and importance.

MATERIAL AND METHODS:

This study was held in the Department of Community medicine and Pediatric department of Nishtar Hospital Multan for one-year duration from February 2019 to February 2020. In order to estimate the bacterio-epidemiologic situation of childhood tuberculosis in Pakistan, 2158 patients with pulmonary symptoms 0-14 years old were clinically, radiologically and bacteriologically examined. Patients were tuberculin-tested and their sputum or gastric washing samples (1-3 times) examined by direct fluorescence microscopy and culture for detection of acid-fast bacilli. Strains of mycobacteria isolated from patients were identified according to the results of growth rate, catalase, niacin, nitrate reduction. TCH (Thiophen-2-carboxylic acid hydrazide) sensitivity and other tests. The drug

sensitivity pattern of the strains were determined by proportion method.

RESULTS AND DISCUSSION:

Infectious agent: Diagnosis of tuberculosis in children usually is based ON clinical pictures and the tuberculin test, because discharge of tubercle bacilli is much less prevalent in children than adults. However, detection of tubercle bacilli is the only way to prove a case as tuberculous; and for this purpose, sputum, gastric contents or laryngeal swabs can be examined. Among 2158 symptomatic patients studied, 110 cases were confirmed tuberculous by bacteriological examinations. The result. of direct microscopy was positive in 21 % of cases and among 94 isolates for which different tests for identification were carried but, the infectious agent was found to be *Mycobacterium tuberculosis*. This indicates that although bovine tuberculosis is an important problem in the country, pasteurization or boiling of milk and proper health inspection of slaughter houses has reduced its transmission. Drug-sensitivity tests were performed on 94 strains of tubercle bacilli and the results indicated that 11.7%. of strains were resistant to one drug (isoniazid or streptomycin). Multiple drug-resistance was not observed. Data on drug-resistance of the parents of cases suffering from drug-resistant strains were not available, so comparison between strains isolated from parents and children was not possible. However primary drug-resistance is more prevalent in children than adults.

Age: More than 63% of patients were less than five and 43% less than three years of age. Figure 1 shows the age distribution pattern in patients and those suffering from miliary tuberculosis. Figure I indicate that in Pakistan, primary infection mostly occurs in early childhood, the most vulnerable 'age group in which development of infection to disease is very high.

Sex: The number of female sufferers was slightly more than males, but the difference was not statistically significant, although studies in Pakistan have shown that tuberculosis is more prevalent among women. The same feature has been observed in South India, while other studies indicate that the incidence rate in males and females is the same from childhood through young adult life and then incidence rate for males becomes higher than females.

Tuberculin reaction: Tuberculin reactions were positive in 79.3% of patients and among those who did not react to tuberculin 63% were suffering from miliary tuberculosis and 73% were less than three

years old. While different studies show 4-36% tuberculin reaction less than 10mm in confirmed adult type pulmonary tuberculosis, the rate is much higher in childhood tuberculosis, especially when the patients are not smear positive or the diagnosis is based on clinical picture and chest X-rays. In tuberculous children, rates of 20-50% negative tuberculin reaction have been reported. However, neither a positive tuberculin reaction indicates that the present illness is due to tuberculosis nor does a negative reaction excludes tuberculous infection, especially in malnourished, very ill, immunosuppressed children or those in the convalescence period of intercurrent infection. Tuberculin-negative reaction in a tuberculous child usually converts to positive by continuation of treatment and disappearance of immunosuppression.

History of BCG vaccination: None of the miliary cases had a history of BCG vaccination. BCG if administered to new-born or young infants, confers considerable protection against tuberculosis. It also reduces the risk of serious disseminated lesions such as meningitis or miliary tuberculosis. and even when

these complications occur the illness will not be severe.

Household contact: One of the family members. usually the mother (54.6% of cases less than two years of age) was suffering from infectious tuberculosis. Sometimes isolation of tubercle bacilli from mother led to detection of disease in child. Studies indicate that 39-65% of household contacts of smear-positive patients aged up to 14 years were tuberculin-positive. Infection in these subjects more often develops into disease, which make early case-finding and effective chemotherapy of infectious cases very important.

Activating factors: In 4.5% of patients the disease appeared after measles infection and in 6.3% of cases, tuberculosis was superimposed on malnourished children, indicating the importance of activating factors.

Clinical findings: The most prevalent clinical findings were fever, cough, weight loss and, respiratory distress, respectively. Table I shows frequency distribution of clinical findings.

Table I: Clinical findings in childhood respiratory tuberculosis

Clinical Findings/Age Group	Fever	Cough	Weight Loss	Respiratory distress	Diarrhea & malabsorption
< 1 year	15	16	5	8	4
1-2	22	14	9	3	5
3-4	9	18	8	3	2
5-6	4	2	2	2	-
7-8	5	4	3	1	-
9-10	1	2	-	-	-
11-12	4	5	4	-	-
13-14	8	13	5	-	-

In early infancy, respiratory distress was more prevalent but cough was less prevalent. Occasionally fever was the only reason for attendance. Spina ventosa accompanied only one case.

Radiological findings: Radiological findings may include enlarged mediastinal lymph nodes, primary

complex, segmental lesions, miliary pattern, or cavity of pleural effusion. Often there is a dissociation between pulmonary shadows and children's physical conditions, so that extensive shadows may be found in a child who is not seriously ill.

Table II shows the results of chest X-rays.

Table II: Radiological findings in childhood respiratory tuberculosis

Radiological Findings\Age Group	Military Pattern	Infiltration			Lymphadenopathy			Cavity			Pleural effusion	
	Bilateral	Right Lung	Left Lung	Bilateral	Right Lung	Left Lung	Bilateral	Right Lung	Left Lung	Right Lung	Left Lung	
<1 Year	8	6	3	5	-	-	-	-	-	-	1	
1-2	12	6	1	5	4	-	3	1	-	1	1	
3-4	6	11	-	5	5	-	1	-	-	1	-	
5-6	1	2	-	1	1	-	1	-	-	-	-	
7-8	-	3	-	1	1	-	-	-	-	-	1	
9-10	-	-	1	-	-	-	-	-	-	-	-	
11-12	-	3	2	-	2	1	1	-	1	-	1	
13-14	-	6	3	2	-	-	-	3	2	1	-	

Radiological findings in 44% of patients were found in the right lung and 15% in the left, but bilateral X-ray shadows were seen in 34% of patients.

REFERENCES:

1. Ios, Vincent, Hugues Cordel, and Maryline Bonnet. "Alternative sputum collection methods for diagnosis of childhood intrathoracic tuberculosis: a systematic literature review." *Archives of disease in childhood* 104, no. 7 (2019): 629-635.
2. Orikiriza, Patrick, Margaret Nansumba, Dan Nyehangane, Mathieu Bastard, Ivan Taremwa Mugisha, Denis Nansera, Juliet Mwangi-Amumpaire, Yap Boum, Elias Kumbakumba, and Maryline Bonnet. "Xpert MTB/RIF diagnosis of childhood tuberculosis from sputum and stool samples in a high TB-HIV-prevalent setting." *European Journal of Clinical Microbiology & Infectious Diseases* 37, no. 8 (2018): 1465-1473.
3. Schaaf, H. Simon, Ben J. Marais, Isabel Carvalho, and James A. Seddon. "Challenges in childhood tuberculosis." In *Tuberculosis*. European Respiratory Society, United Kingdom, 2018.
4. Togun, Toyin Omotayo, Emily MacLean, Beate Kampmann, and Madhukar Pai. "Biomarkers for diagnosis of childhood tuberculosis: a systematic review." *PloS one* 13, no. 9 (2018).
5. Jaganath, Devan, Eric Wobudeya, Moorine Penninah Sekadde, Betty Nsangi, Heather Haq, and Adithya Cattamanchi. "Seasonality of childhood tuberculosis cases in Kampala, Uganda, 2010-2015." *PloS one* 14, no. 4 (2019).
6. Gandra, Nayantara Rao, and Jayasri Helen Gali. "GeneXpert: a game changer in the detection and diagnosis of childhood tuberculosis." *Int J Contemp Pediatr* 5, no. 1 (2018): 35-41.
7. Nonyane, Bareng AS, Mark P. Nicol, Nicholas J. Andreas, Stefanie Rimmele, Nicole Schneiderhan-Marra, Lesley J. Workman, Mark D. Perkins et al. "Serologic responses in childhood pulmonary tuberculosis." *The Pediatric infectious disease journal* 37, no. 1 (2018): 1.
8. Kabir, Senjuti, Mohammad Khaja Mafij Uddin, Mohammad Jobayer Chisti, Tilka Fannana, Mohammad Enamul Haque, Muhammad Reaj Uddin, Sayera Banu, and Tahmeed Ahmed. "Role of PCR method using IS6110 primer in detecting Mycobacterium tuberculosis among the clinically diagnosed childhood tuberculosis patients at an urban hospital in Dhaka, Bangladesh." *International Journal of Infectious Diseases* 68 (2018): 108-114.

9. Carvalho, Isabel, Delia Goletti, Selene Manga, Denise Rossato Silva, Davide Manissero, and G. Migliori. "Managing latent tuberculosis infection and tuberculosis in children." *Pulmonology* 24, no. 2 (2018): 106-114.
10. Ogbudebe, Chidubem L., Victor Adepoju, Christy Ekerete-Udofia, Ebere Abu, Ginika Egesemba, Nkem Chukwueme, and Mustapha Gidado. "Childhood tuberculosis in Nigeria: Disease presentation and treatment outcomes." *Health services insights* 11 (2018): 1178632918757490.
11. Jafta, Nkosana, Prakash M. Jeena, Lars Barregard, and Rajen N. Naidoo. "Association of childhood pulmonary tuberculosis with exposure to indoor air pollution: a case control study." *BMC public health* 19, no. 1 (2019): 275.
12. Reuter, Anja, Jennifer Hughes, and Jennifer Furin. "Challenges and controversies in childhood tuberculosis." *The Lancet* 394, no. 10202 (2019): 967-978.
13. Kizito, S., A. Katamba, C. Marquez, P. Turimumahoro, I. Ayakaka, J. L. Davis, and A. Cattamanchi. "Quality of care in childhood tuberculosis diagnosis at primary care clinics in Kampala, Uganda." *The International Journal of Tuberculosis and Lung Disease* 22, no. 10 (2018): 1196-1202.
14. Adamu, Haruna Ismaila, Tolulope Andrea Osoba, Cornelia R. White, and Yakubu Gida Abdullahi. "Relationship between Caregiver's Quality of Life and Childhood Tuberculosis in Bauchi State, Northeastern Nigeria." *Open Access Library Journal* 5, no. 5 (2018): 1-10.
15. Hamdi, Bisma, Serry Jdidi, Hajer Kchok, Iness Moussa, Jamel Ammar, Anissa Berraies, and Agnes Hamzaoui. "Lymph-node puncture benefits in ganglionic childhood tuberculosis." (2018): PA2725.