Section: Paediatrics

Original Research Article

STUDY OF EXTRA PULMONARY TUBERCULOSIS IN PAEDIATRIC PATIENTS OF NORTH KARNATAKA POPULATION

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Abstract

Background: Extra pulmonary TB is one of the major causes of death among children globally. It includes various sites of infection; hence, it is a challenge for clinicians to diagnose and treat. **Materials and Methods:** 85 children 0–4 years of age with extra pulmonary TB were studied. They were diagnosed clinically and microbiologically for detection of mycobacterium TB.with TB. **Results:** Lymphadenitis, 22 (25.8%) pleural effusions, 13 (15.2%) meningitis, 5 (5.88%) skeletal tuberculosis, 3 (3.52%) milliary tuberculosis, 2 (23.5%) abdominal tuberculosis, and 1 (1.57%) pericarditis. The culture confirmed cases were 15 (38.4%) lymphadenitis, 7 (31.8%) pleural effusion, 7 (53.8%) meningitis, 1 (20%) skeletal tuberculosis, 3 (100%) milliary tuberculosis, and 1 (100%) pericarditis. The CSF study had moderate elevations in WBC, ALC, and ANC protein levels but within normal limits. **Conclusion:** Children with tuberculosis reflect the inadequacy of the public health system in controlling transmission of infection in the community. Prompt and efficient identification of the source of transmission and effective treatment, environmental measures are intimately linked to the control of children with tuberculosis.

INTRODUCTION

Tuberculosis is one of the major diseases that cause death globally. An estimated 1.3 million cases of tuberculosis and 450,000 deaths associated with it. Occur annually in children.[1] Extra pulmonary tuberculosis accounts for one-third of all cases. Children show a higher predisposition to the development of extra pulmonary tuberculosis.[2] The impact of extra pulmonary tuberculosis is greatest among infants and young children, who tend to develop meningitis and milliary tuberculosis. The clinical presentation of paediatric TB varies among regions due to epidemiological situations and the HIV burden in the host country.[3] Moreover, the diagnosis of paediatric TB also varies depending on the available resources in the country. Hence, an attempt is made to evaluate extra pulmonary TB in predicated in different age groups of both sexes with available resources.

MATERIALS AND METHODS

85 children of different age groups who regularly visited ESIC medical college and hospital in Gulbarga, Karnataka, were studied.

Inclusive Criteria

Children diagnosed with extra pulmonary tuberculosis aged 0 to 14 who have given written consent for treatment by their parents or guardians were selected for study.

Exclusion Criteria

Children above 14 years with pulmonary tuberculosis, malignancy, or congenital anomalies were excluded from the study.

Method

Every patient was studied clinically and microbiologically to confirm extra pulmonary TB. Clinically diagnosed cases were defined based on symptoms, radiological findings, and a positive tuberculin skin test (TST). Microbiologically positive sputum or gastric aspirate, pleural fluid, cerebrospinal fluid (CSF), or surgical biopsy smear for acid-fast bacilli or detection of mycobacterium

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TB in cartridge-based nucleic acid amplification test TB culture

The definition of symptoms was adapted from the RNTCP 2015 guideline: persistent fever and/or coughs for more than 2 weeks with loss of weight, no weight gain, and/or history of contact with infections TB case (5).

The duration of the study was from May 2022 to April 2023.

Statistical Analysis

Various sites of infection with culture-confirmed causes were classified by percentage. The statistical analysis was carried out in SPSS software. The ratio of male and female children was 2:1.

RESULTS

Table 1: Distribution of extra pulmonary tuberculosis at various sites of infection and age groups

39 (45.8%) lymphadenitis at 1 to 12 years of age, 22 (25.8%) pleural effusion at 2-14 years of age, 15 (15.2%) meningitis at 5 months to 2 years, 5 (5.88%) skeletal tuberculosis at 6 to 14 years of age, 3 (3.52%) milliary tuberculosis at 5 months to 1 year of age, and 2 (2.35%) abdominal tuberculosis at 3 years to 9 years of age.

Table 2: Study of culture confronted cases of extra-pulmonary tuberculosis in children: 15 (38.4%) lymphadenitis, 7 (31.3%) pleural effusion, 7 (53.8%) meningitis, 1 (20%) skeletal tuberculosis, 3 (100%) milliary tuberculosis, and 1 (100%) pericarditis.

Table 3: Study of CSF in meningitis due to extra pulmonary tuberculosis

472 (350–1240 cell/ µl) WBC count, 435 (315–930 cells/ µl) ALC count, 79 (35–310 cells/ µl) ANC count, 385 (82–685 mg/l) protein, 18 (10–70 mg/l) Glucose level, 0.09 (0.08-0.65) Glucose level ratio.

Table 1: Distribution of extra pulmonary

Sites of infection	No. of children	Age group
Lymphadenitis	39 (45.8%)	1 to 12 years
Pleural effusion	22 (25.8%)	2-14 years
Meningitis	13 (15.2%)	5 months to 2 years
Skeletal tuberculosis	5 (5.88%)	6-14 years
Milliary tuberculosis	3 (3.52%)	5 months
Abdominal tuberculosis	2 (2.35%)	3 years to 9 years
Pericarditis	1 (1.17%)	8-9 years

Table 2: Study of cultured confirmed cases in extra pulmonary tuberculosis of children

Types of infection	No. of Cultures (confirmed) 34
Lymphadenitis	15 (38.4%)
Pleural effusion	7 (31.8%)
Meningitis	7 (53.8%)
Skeletal tuberculosis	1 (20%)
Milliary tuberculosis	3 (100%)
Abdominal tuberculosis	0 (0%)
Pericarditis	1 (100%)

Table 3: Study of CSF in children having tubercular meningitis

Parameters	Results
WBC count (cells / µl)	472 (350-1240)
ALC count (cells/ µl)	435 (315-930)
ANS count (cells/ µl)	79 (35-310)
Protein level (mg/l)	385 (80-685)
Glucose level (cells/l)	18 (10-70)
Glucose level ratio	0.09 (0.08-0.65)

WBC = white blood count

ALC = Absolute lymphocyte count

NAC = Absolute Neutrophil count

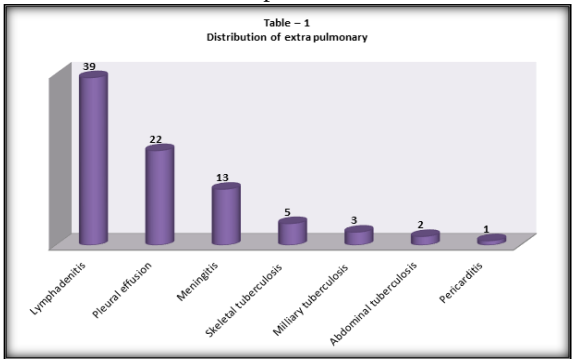

Figure 1: Distribution of extra pulmonary

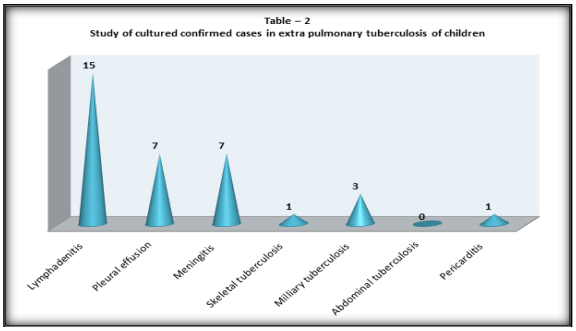

Figure 2: Study of cultured confirmed cases in extra pulmonary tuberculosis of children

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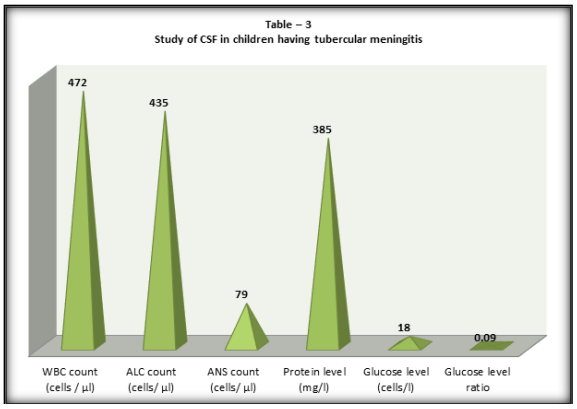

Figure 3: Study of CSF in children having tubercular meningitis

DISCUSSION

Present study of extra pulmonary TB in paediatric patients in the north Karnataka population. The distribution of extra pulmonary group tuberculosis at various sites of infection and age groups 39 (45.8%) lymphadenitis at 1 to 12 years of age, 22 (25.8%) pleural effusion 2-14 years of age, 13 (15.2%) meningitis 5 months to 2 years, 5 (5.88%) selected TB at 6-14 years of age, 3 (3.52%) military tuberculosis 5 months to 1 year, 2 (2.35%) abdominal tuberculosis at 3 years to 9 years, and 1 (1.17%) pericarditis at 8-9 years of age (Table-1). In the study of culture-confirmed cases of extra pulmonary TB in children. Out of 34 culture confirmed cases – 15 (38.4%) were lymphadenitis, 7 (31.8%) were pleural effusion, 7 (58.8%) were meningitis, 1 (20%) were skeletal tuberculosis, 3 (100%) were milliary tuberculosis, and 1 (100%) were pericarditis (Table-2). The CSF study in meningitis due to extra pulmonary TB in children – 472 (350–1240) WBC count cells/ µl), 435 (315–930) ALC count (cells/µl), 79 (35–310) ANC count cells/µl, 385 (82–685) protein level, and 18 (0–70) glucose level (mg/l) 0.09 (0.08–0.65) glucose level ratio (Table-3). These findings are more or less in agreement with previous studies.[6,7,8]

Before the availability of agents with activity against M. tuberculosis, the development of tuberculosis was associated with a progressive course and a fatal outcome in up to 50% of the patients.[9] The introduction of anti-tuberculosis agents has become the cornerstone of management of such infections. Every patient was treated with anti-tubercular drugs, as per their body weight and cured successfully. No mortality was observed in the present study.

Tuberculosis meningitis remained the most serious form of extra pulmonary TB; hence, long-term complications were observed only in meningitis TB children; permanent neurological deficits developed in more than one-third of patients' younger age and delay in approaching medical aid resulted in serious complications with febrile illness.[10] Meningitis TB in children must be confirmed by abnormal chest x-rays and positive tuberculosis in skin test reactions as a differential diagnosis.[11,12]

However in the present study, although HIV patients were not included, a few cases of multiple drug resistant M. tuberculosis were detected and excellent clinical responses to the standard anti-tuberculosis regimens were observed in such patients. Poverty, malnutrition, and parental neglect of their children's health are major risk factors for extra pulmonary tuberculosis.

CONCLUSION

Childhood tuberculosis reflects the inadequacy of the public health system in controlling the transmission of infection in the community. Prompt and efficient identification of the source of transmission, proper treatment as per body weight, and the application of effective environmental measures play vital roles in the control of childhood tuberculosis. This study demands further awareness among the people by medico social workers regarding the signs and symptoms of tuberculosis in childhood patients because illiteracy still prevails in India, including in many underdeveloped countries.

Limitation of Study

Owing to the tertiary location of the research centre, the small number of patients, and the lack of the latest technologies, we have limited findings and results.

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