

Pattern of cutaneous tuberculosis among children and adolescent

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Abstract

Cutaneous tuberculosis is one of the most subtle and difficult diagnoses for dermatologists practicing in developing countries. It has widely varied manifestations and it is important to know the spectrum of manifestations in children and adolescent. Sixty cases (age<19 years) of cutaneous tuberculosis were included in this one period study. The diagnosis was based on clinical examination, tuberculin reaction, histopathology, and response to antitubercular therapy. Histopathology revealed 38.3% had skin tuberculosis and 61.7% had diseases other than tuberculosis. Among 23 histopathologically proved cutaneous tuberculosis, 47.8% had scrofuloderma, 34.8% had lupus vulgaris and 17.4% had tuberculosis verrucosa cutis (TVC). Most common site for scrofuloderma lesions was neck and that for lupus vulgaris and TVC was lower limb. Cutaneous tuberculosis in children continues to be an important cause of morbidity, there is a high likelihood of internal involvement, especially in patients with scrofuloderma. A search is required for more sensitive, economic diagnostic tools.

Introduction

Tuberculosis (TB), an ancient disease has affected humankind for more than 4,000 years¹ and its estimated total number of cases has reached to the highest in its history². In Bangladesh, TB remains a major cause of morbidity and mortality¹ and the burden of TB patients in Bangladesh is sixth of its world burden^{1,3,4}. The global burden of tuberculosis among children under age 15 is 884019, 11.0% of total cases of tuberculosis⁵.

Cutaneous TB, as like its systemic forms have a variable clinical appearance, significance and prognosis. Childhood cutaneous TB has a prevalence rate among all forms of TB ranges from 18.7% to 53.7% in India and other Asian countries⁶⁻¹². The clinical presentation of different types of cutaneous TB varies and determined by factors such as route of infection and cellular immune status of the host¹⁰. The current study was aimed to describe the varied clinicopathological patterns of cutaneous tuberculosis in children and adolescents.

Materials and Methods

This cross sectional observational study was conducted in all government medical college hospitals in Dhaka, Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh Institute

of Child Health (BICH) and Institute of Diseases of Chest and Hospital (IDCH) from January to December 2010. Sixty children (<19 years) with tuberculosis were included after taking consent from parents or the legal guardians. A detailed history including present and past history of tuberculosis and BCG immunization status were taken and a thorough physical examination was done. Complete blood count (CBC), erythrocyte sedimentation rate (ESR), mantoux test, X-ray of chest and other regions, ultrasound of the abdomen and biopsy of the lesion were done. The mantoux test was performed using 1 tuberculin unit (0.02 mg of purified protein derivative) and read at 72 hours. Induration of more than 10 mm was taken as suggestive of infection with *mycobacterium tuberculosis* in non vaccinated patients and 15 mm and above was in vaccinated patients.

Result

In the current study, 60 children with cutaneous tuberculosis were analyzed to explore the clinicopathological spectrum of skin TB in Bangladesh. Out of them maximum 46.7% patients were within 11 to 15 years age group followed by 25% within 6-10 years, 15% more than 15 years and 13.3% up to 5 years. Mean age of the patients was 11.6±3.92 years.

Seventy percent were male and 30.0% female. Most 91.7% of the patients were from poor social strata and only 8.3% from middle class (Table I).

Table I: Demographic variable (n=60)

Variables	Frequency	Percent
Up to 5	8	13.3
Age		
6-10	15	25.0
11-15	28	46.7
>15	9	15.0
Mean±SD (range)=11.6±3.92 (4-18)		
Sex		
Male	42	70.0
Female	18	30.0
Total	60	100.0
Socioeconomic status		
Poor	55	91.7
Middle	5	8.3

Five percent of the children had previous history of tuberculosis, 10% had family history of tuberculosis and only one patient had radiological evidence of pulmonary tuberculosis. Seventy five percent of children had single and 25% had multiple lesion on skin. Histopathology revealed 38.3% had skin tuberculosis and 61.7% had diseases other than tuberculosis. Among 23 histopathological proved cutaneous tuberculosis, 47.8% had scrofuloderma, 34.8% had lupus vulgaris and 17.4% had TVC (Table II).

Table II: Distribution of the clinico-pathological characteristics of the patients with cutaneous tuberculosis (n=60)

Variables	Frequency	Percent
Previous history of TB		
Present	3	5.0
Absent	57	95.0
Family history of tuberculosis		
Present	6	10.0
Absent	54	90.0
X-ray chest findings		
Pulmonary TB	1	1.7
Normal	59	98.3
Number of lesion		
Single	45	75.0
Multiple	15	25.0
Histopathology		
Skin TB	23	38.3
Other than Skin TB	37	61.7
Clinico-pathological types(n=23)		
Scrofuloderma	11	47.8
Lupus vulgaris	8	34.8
Tuberculosis Verrucosa Cutis (TVC)	4	17.4

Most common site of scrofuloderma was neck (figure 1) and that for lupus vulgaris and TVC was lower (figure 2) limb. Second most common site for scrofuloderma was groin and that for lupus vulgaris was face (figure 3). Lymph node was found enlarged in 5 (45.3%) cases of scrofuloderma and 1(12.5%) cases of lupus vulgaris. In TVC systemic involvement was not found. All (100%) of lupus vulgaris and

TVC cases and 90.9% of scrofuloderma cases were found immunized with BCG. Mantoux positivity was found in 63.6% of scrofuloderma cases, 62.5% lupus vulgaris and 100% of TVC cases (Table III).

Table III: Pattern of presentation of the cutaneous tuberculosis

Character	Scrofuloderma (n=11)	Lupus vulgaris (n=8)	Tuberculosis Verrucosa Cutis (TVC) (n=4)
Most common site	Neck	Lower limb	Lower limb
Second most common site	Groin	Face	
Systemic involvement others	Lymph node 5(45.3%) none	1(12.5%) 1(12.5%)	None None
BCG vaccination	10(90.9%)	8(100.0%)	4 (100.0%)
Mantoux positivity	7(63.6%)	5(62.5%)	4 (100.0%)



Fig. 1: Scrofuloderma



Fig. 2: Tuberculosis verrucosa cutis (TVC)



Fig.3: Lupus vulgaris.

Discussion

Tuberculosis (TB) is a major public health problem in Bangladesh. In 2008, the World Health Organization (WHO) ranked Bangladesh sixth among the world's 22 high-burden TB countries. The incidence of both pulmonary and extra pulmonary TB

is expected to rise. The emergence of HIV virus has led to a 20% increase in incidence of extra pulmonary TB in the U.S.¹³. Although the prevalence of cutaneous TB in Bangladesh is not known, it accounts for 0.1-0.9% of the total dermatology outpatients in India^{6,14}. Cutaneous tuberculosis represents 1.5% of all cases of extra pulmonary tuberculosis¹⁵.

The current study was conducted to see the pattern of cutaneous tuberculosis in children and adolescent in Bangladesh. Cutaneous TB affects the entire age spectrum in children¹⁶. Majority of children in the current study were from the age group of 11 to 15 years with a mean age of the patients was 11.6±3.92 years, which is close to some previous studies (10 to 14 years group) though these can not be compared with many other studies as different studies had different age group^{6,17,18}.

Tuberculosis in children usually contracted from infected family members, in the current study 5% of the children had previous history of tuberculosis, 10% had family history of tuberculosis and only one patient had radiological evidence of pulmonary tuberculosis. In different Indian studies an infected parent or close household member were found in 19.0% to 41.2% cases^{9,10,19}. Most (91.7%) of the patients in the current study in agreement with previous Indian studies^{9,10,19} were from poor social strata and only 8.3% from middle class. In developed countries, 10-15% of TB cases have extra-pulmonary involvement, but in patients from high-incidence countries the rate is much higher. People who are HIV positive and infected with TB develop extra-pulmonary disease much more frequently, up to 50% of cases¹⁸.

Confirmatory diagnosis and exclusion other differential diagnosis of skin TB by clinical features and histopathology is really difficult^{9,20,21}. In the current study among sixty clinically diagnosed skin TB cases only 23 (38.3%) was histopathologically diagnosed as skin TB. Among those Scrofuloderma was the most common pattern of skin TB in children and adolescent, which was consistent with different previous India studies^{6,10,11,19}. The second most common type of skin TB seen in the current study was lupus vulgaris which is considered as the most common type in adult^{6,11,16}. Although TVC is defined as uncommon form of cutaneous tuberculosis among Indian children¹⁶, higher rate was found in Hongkong²² (65.5%) and other Indian studies^{6,10,11,19} and it was found in 17.4% cases of our series.

In agreement with previous studies, majority of the Scrofuloderma lesions were located on neck area^{6,10,11,19}. Most of the lupus vulgaris lesions were situated on lower limb which is explained by high prevalence of children with habit of out door games without clothings¹⁶ and TVC was found typically on exposed part of the body (lower limb)^{6,10,11,19}.

Scrofuloderma commonly results from contiguous involvement of the skin overlying tuberculosis in a deeper structure, which is most commonly lymph node, bone or joint^{6,7,10,11}. In the current study, in 45.3% of Scrofuloderma patients have enlarged lymph node and only one cases of lupus vulgaris patient had lung and lymph node involvement and none of TVC cases had systemic involvement. Some studies^{6,11,22,23}, demonstrated that BCG immunization has some protective role against skin TB and others failed to demonstrated such association^{9,11}. In the current study, 90.9% patients of Scrofuloderma, all of lupus vulgaris and tuberculosis Verrucosa cutis cases were vaccinated for BCG. The Mantoux test, a good screening test for TB infection was found to be positive in >90.0% children with TB^{6,19}. In the current study 63.6% of Scrofuloderma, 62.5% lupus vulgaris and 100.0% of TVC patients found to be positive for Mantoux test.

Skin tuberculosis as well as other extra-pulmonary TB is an important issue in the era of HIV-AIDS. As current and newer diagnostic tools are not enough sensitive, specific or cost effective in its diagnosis, knowing its clinical pattern and presentation is important. Scrofuloderma is the most common type of skin TB in children and adolescent scrofuloderma is the most common type of skin TB in children and adolescent followed by lupus vulgaris and tuberculosis verrucosa cutis (TVC).

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