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Original Research Article

Clinico-epidemiological profile of cutaneous tuberculosis at a tertiary care teaching hospital of South Rajasthan

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ABSTRACT

Background: Cutaneous tuberculosis represents only 1-2% of total tuberculosis cases but due to difficulty in diagnosis even with molecular methods and non-availability of such tests at resource poor set ups, actual burden of cutaneous TB remains under-estimated. The present study was performed to analyse the magnitude and clinico-epidemiological profile of cutaneous tuberculosis at our tertiary level referral centre.
Methods: All the clinically suspected cases of cutaneous tuberculosis attending the dermatology and paediatric outpatient department during a period of 30 months (from October 2015 to March 2018) were enrolled in the study. All patients were subjected to routine blood tests, Chest X-ray, sputum for Ziehl-Neelsen staining, HIV-ELISA, Mantoux test and cutaneous punch biopsy of the lesions for further confirmation.
Results: During the study period of 30 months, total 30 patients were recruited with male to female ratio of 1.5:1 and mean age of 27 years. Mean disease duration was 13 months with head and neck region (60%) being most commonly affected. Most common clinical type of cutaneous tuberculosis was scrofuloderma (60%), followed by lupus vulgaris (26.7%), tuberculosis verrucosa cutis (10%) and papulonecrotic tuberculid (3.3%). Mantoux test was positive in 56.7% patients. All the patients were put on antitubercular treatment as per guidelines of national tuberculosis control programme.
Conclusions: Tuberculosis in developing countries is still an important cause of skin lesions which remains doubtful in most case scenarios even after years of its advent due to difficulty in diagnosis. Clinical diagnosis and therapeutic trials are still helpful in managing most of the cases.

Keywords: Cutaneous tuberculosis, Scrofuloderma, Mantoux test, South Rajasthan

INTRODUCTION

Since the discovery of Mycobacterium tuberculosis in 1882 by Robert Koch, tuberculosis is still one of the leading causes of death related to infectious disease till today.[1] Cutaneous tuberculosis has become a rare event in developed countries. In the developing countries also, the incidence has fallen significantly from 2 to 0.1%.[2,3] The combination of better hygiene, immunizations and anti-tubercular therapy (ATT) led to a drop but the advent of HIV/AIDS, the emergence of drug resistance due to inappropriate treatment, infection with multidrug resistant mycobacteria and iatrogenic immunosuppression have contributed to resurgence of the disease.[4]

Cutaneous tuberculosis is an infectious disease mainly caused by Mycobacterium tuberculosis, having exogenous, endogenous, or autoinoculation mode of skin

transmission.[5] The clinical types depend on the route of infection, virulence of the bacillus, and status of cellular immunity of the host.[6] The clinical presentation of cutaneous tuberculosis is diverse and includes warty plaques, infiltrated plaques with scarring, inflammatory papules, suppurative nodules, chronic ulcers, necrotic lesions and non-inflamed clusters of papules. Atypical manifestations may be seen in patients with HIV co-infection.[7] Hence, the present study was performed to analyse the magnitude and clinico-epidemiological profile of cutaneous tuberculosis at our tertiary level referral centre.

METHODS

This hospital-based, observational study was done in a tertiary level teaching center of South Rajasthan (Maharana Bhupal Government Hospital, Udaipur) over a period of 30 months (from October 2015 to March 2018).

Inclusion and exclusion criteria

All the clinically suspected cases of cutaneous tuberculosis attending the dermatology and paediatric outpatient department were enrolled in the study. Patient unwilling for consent and atypical mycobacterial infections were excluded.

Sample size of 30 patients was calculated. Informed consent was taken from all the patients. A detailed history was taken including age, sex, occupation, socioeconomic status, site and duration of the lesion, nature of spread, present and past history of TB of other organs, family members and close relatives as well as the history of BCG vaccination. Dermatological and systemic examination was done in all the patients. Routine investigations (complete blood count, erythrocyte sedimentation rate, liver function test, kidney function test), Mantoux test, enzyme linked immunosorbent assay (ELISA) for HIV, chest X-ray and skin punch biopsy for Haematoxylin-Eosin (H& E) and Ziehl-Neelsen (ZN) staining were done in all the cases. Sputum examination for acid fast bacilli and fine needle aspiration cytology of lymph nodes were done in relevant cases. Other imaging studies were done to find out the systemic focus. Diagnosis of cutaneous tuberculosis was based on clinical features, Mantoux test and histopathological examination of skin biopsy.

RESULTS

A total of 30 patients were recruited in 30 months study period. Demographic details are shown in Table 1. Male to female ratio in our study was 1.5:1. Among the different age groups, the 1-20 years group was the most commonly affected group (N=17, 56.7%). Scrofuloderma was most common type seen in 60% cases, followed by lupus vulgaris in 26.7%, tuberculosis verrucosa cutis in 10% (Figure 1) and papulonecrotic tuberculid in 3.3% (Figure 2) patients. Clinical types of cutaneous tuberculosis according to age group is shown in Figure 3. The most common site affected was head and neck, followed by extremities.

Table 1: Demographic profile of cutaneous tuberculosis patients.

Parameters	N (%)
No of patients	30
Age (years)	1.5-65
Mean	27
Sex	
Male	18 (60)
Female	12 (40)
Duration of disease (months)	**1 month- 8 years**
≤6	18 (60)
>6-12	7 (23.3)
>12	5 (16.7)
Clinical types	
Scrofuloderma	18 (60)
Lupus vulgaris	8 (26.7)
Tuberculosis verrucosa cutis	3 (10)
Papulonecrotic tuberculid	1 (3.3)
Site of involvement	
Head and neck	18 (60)
Lower limb	7 (23.3)
Upper limb	3 (10)
Trunk	2 (6.7)
Number of lesions	
Single	18 (60)
≤10	11 (36.7)
Innumerable	1 (3.3)

Scrofuloderma affected the head and neck most commonly in 66.7% cases, lupus vulgaris affected face and extremities in 50% cases each, and tuberculosis verrucosa cutis affected the lower extremities in 100% of cases.

Figure 1: Tuberculosis verrucosa cutis on left foot.

Most of the patients (83.33%) belonged to poor socioeconomic status and most (86.67%) were un-educated or non-matric pass.

Table 2: Clinico-epidemiological profile of cutaneous tuberculosis patients in various studies.

Study	Present	Maghwal[14]	Saha[17]	Kannan[13]	Zhang[18]	Aruna[12]	Singh[7]	Splta[19]	Thakur[16]	Mathur[11]	Puri[10]	Dwari[20]
Total patients	30	40	28	20	1194	25	45	29	47	42	30	50
Sex ratio	1.5:1	2.07:1	3:4	1.5:1	0.7:1	1.5:1	1.6:1	0.6:1	1.5:1	1.2:1	1.5:1	1.2:1
Age range			5-85	11-68	-	5-40	5-62	10-81	4-78	3-65	-	9-78
Most common type (%)	Scrofuloderma (60)	Scrofuloderma (40)	lupus vulgaris (42.85)	Lupus vulgaris (35)	EIB (35.8)	Lupus vulgaris (44)	Lupus vulgaris (42.2)	EIB (41.4)	Lupus vulgaris (64)	Scro-fuloderma (50)	Lupus vulgaris (55)	TVC (48)
Most common site (%)	Head & neck (60)	Neck and trunk	Limbs and face	-	Lower limb (41.2)	Lower limb (52)	Head & neck, Lower limb (each 33.33)	Lower limb (65.8)	Limbs (55)	Head & Neck (47.62)	Limbs (50)	Limbs & buttocks (48)
Family history (%)	26.7	-		-	-	-	8.9	10.34	4.2	38.1	-	-
Lymph nodes (%)	60	-	8 (28.57)	-	-	-	-	10.34	12.76	45.24	-	8
HIV association (%)	6.67	5	0	-	-	12	-	14.3	0	0	-	2
Mantoux positivity (%)	56.7	65	21.43	-	-	84.20	66.7	41.4	100	83.33	33.33	96

EIB- Erythema induratum of Bazin, TVC- Tuberculosis verrucosa cutis

Family history of tuberculosis was present in 8 (26.7%) patients; most of them (6;75%) had scrofuloderma (Figure 4).

Figure 2: Papular lesions over back in patient with papulonecrotic tuberculid.

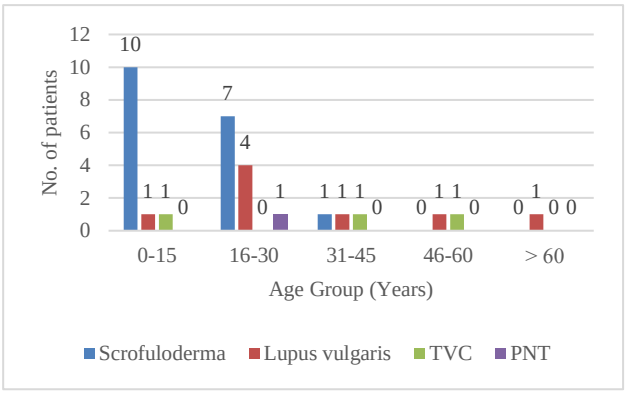

Figure 3: Clinical types of cutaneous tuberculosis according to age group.

Figure 4: Scrofuloderma in siblings.

Systemic complaints were associated in 8 patients. Lymphadenopathy was seen in 60% patients, more significant in cases of scrofuloderma. Cervical lymph nodes (55.5%) were commonly involved followed by inguinal (33.3%). ESR was raised (> 20 mm) in 30% patients. Mantoux test was positive in 17 (56.7%) patients, out of them 11 had induration of 10-15 mm, 3 cases with 16-20 mm, >20mm in one patient and 2 had bullous reactions. Bullous reaction was noted in each patient of lupus vulgaris (Figure 5) and papulonecrotic tuberculid. Sputum examination was negative in all the patients. Two patients were found to be HIV positive. BCG scar was absent in most of the patients (83.33%). Total seven patients had extracutaneous tuberculosis, out of which one had bony involvement and others were of pulmonary tuberculosis proven by CT scan and chest X-ray findings. One patient had scrofuloderma, Hansen's disease and HIV in combination. Three patients were already receiving anti-tubercular treatment. All the patients were put on antitubercular treatment as per guidelines of national tuberculosis control programme.

Figure 5: Bullous Mantoux reaction in lupus vulgaris patient.

DISCUSSION

Cutaneous tuberculosis is one of the less common clinical forms of tuberculosis accounting for approximately 1-2% of total extra-pulmonary cases but contributes to significant morbidity.[7] Cutaneous tuberculosis showed a higher incidence in men in our study similar to majority of the Indian studies (Table 2).[7-14] This may be attributed to higher risk of exposure in men due to increased outdoor activities. Interestingly in our study children, adolescents and young adults are equally affected compared to other studies. Average age and age range was almost similar to previous studies. Scrofuloderma (60%) was most common type in our study, similar to other Indian studies.[14-16] The reason may be a greater number of children enrolled in our study and scrofuloderma is more common in this age group. Most of the other studies[7,10-13,17] found lupus vulgaris as the most common type. Lupus vulgaris was the second most common type in our study, seen in 26.7% of patients. The retrospective studies containing large number of patients conducted at China and Brazil reported erythema induratum of Bazin as the most common type of cutaneous tuberculosis.[18,19] This may be due to the difference in the prevalence of tuberculosis, the varied immunity status among different populations and predominance of female patients in their studies. Papulonecrotic tuberculids have been reported uncommonly in the literature. We found only 1 patient

with papulonecrotic tuberculid in contrast to Arora et al[8] who reported 7 cases in their study.

The commonest site of cutaneous tuberculosis varied from study to study. Head and neck area were the most commonly involved sites in our study as opposed to most of the previously conducted studies, where lower limb was the commonly involved site.[12,17-19] Forty percent of our patients had more than one lesion which was very high than other studies.[9,16,19] This may be due to the fact that most of our patients were of scrofuloderma, which is mostly a pauci-immune tuberculosis and such patients may have multiple lesions. The factors like over-crowding and poor hygiene create favourable environment for spread of tuberculosis among contacts and family members. Eight (26.67%) patients had family/contact history of tuberculosis, which was lower than the study by Thakur et al and higher than the some other studies.[7,9,11,15,19] The contact history was found positive more in patients of scrofuloderma likely because scrofuloderma is a pauci-immune type of cutaneous tuberculosis and such patients are more prone to acquire disease from contacts.

The positivity of the Mantoux test has been reported from 68% to 100% in various studies.[8,9,11,12,16,20] However, our study showed slightly lower incidence (56.7%) of Mantoux positivity which was in accordance with studies by Singh et al and Maghwal et al.[7,14] Of 30 patients, 7 were (23.3%) associated with extracutaneous tuberculosis. Of these, 6 cases had associated pulmonary TB and one had bone TB. All cases of tuberculous lymphadenitis were associated with scrofuloderma. The frequency of involvement of extracutaneous site of TB varied widely in different studies.[19,20] Spelta et al reported 27.6% extracutaneous TB while Dwari et al reported only in 4% cases. Amraoui et al reported 7 cases of multifocal TB including cutaneous involvement in immunocompetent patients explaining the endemic nature of cutaneous tuberculosis.[21] The frequency of HIV positive patients in our study was similar to that found by Maghwal et al and Dwari et al.[14,20] Some studies showed slightly higher incidence of HIV positivity.[8,12,15,19] HIV being the most important known risk factor that promotes progression to active TB in people with Mycobacterial tuberculosis infection, the number of cases of both pulmonary and extrapulmonary TB is expected to rise.[15] One young adult male patient had scrofuloderma, Hansen's disease and HIV in combination. He was put on anti-tubercular treatment followed by anti-retroviral drugs, but unfortunately died of complications. Three patients were already receiving anti-tubercular treatment and rest of the patients were treated with DOTS therapy according to recent Revised National Tuberculosis Control Programme guidelines.

Limitations

Current study has limitation in terms of microbial or molecular confirmation of cases due to affordability and non- availability of the investigations.

CONCLUSION

This study highlights the grave fact that even after so many years of immunization programme implementation, many still remain un-vaccinated. Along with that many still are poorly educated which can be due to socioeconomic, accessibility, etc issues, but it surely does impact the protective and preventive aspects of communicable diseases.

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