Clinico-epidemiological study of cutaneous tuberculosis in a tertiary care hospital of Rajasthan

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Abstract—*India constitutes about one fourth of the Global TB burden. Cutaneous TB is less common clinical form of tuberculosis accounting for 1-2 % of the total extra-pulmonary cases. Objective of this study was to describe the clinical and epidemiological pattern of Cutaneous TB presenting in the Skin Outpatient Department (OPD). Patients presenting with clinically suspected skin lesions of Cutaneous TB from January 2015 to August 2016 were included in the study. Dermatological and systemic examination was carried out and histopathogical examination of skin punch biopsy was done. It was observed that out of a total of sixty patients, 45 (75%) patients were found to have features of Cutaneous TB on histopathology. Lupus vulgaris (42.2%) was the most common form of Cutaneous TB. Most patients were in age group of 11-30 years. Male to female ratio was 1.6:1. Most common sites of involvement were lower limbs and neck. Mantoux test was positive(≥15 mm induration) in 66.7% cases. Typical tuberculoid histology was found in 91.1% cases. No cases of tuberculids were seen and non-specific chronic inflammation was seen in six cases. It was concluded that Cutaneous TB may present with different morphological patterns resembling other inflammatory, infective and neoplastic conditions. Proper and thorough investigations are necessary for detection of Cutaneous TB as the annual incidence of total TB cases in India is high.*

Keywords: Cutaneous TB, Lupus vulgaris, Mantoux test, Clinico-epidemiology.

I. INTRODUCTION

Mycobacterium tuberculosis was discovered more than 130 years ago and anti-tubercular therapy (ATT) had been used for more than 50 years, still TB continues to kill more than 1.7 million people globally each year. It is one of the leading causes of death from an infectious disease and is an enormous global health problem[1].In last few decades, resurgence of tuberculosis has been documented in both developed and developing nations and this increase in TB burden coincided with human immunodeficiency virus (HIV) epidemics. Since then the disease pattern has changed with a higher incidence of extra-pulmonary tuberculosis (EPTB) as well as disseminated TB. Incidence of Cutaneous TB has increased in areas with a high HIV incidence and multi-drug resistant pulmonary tuberculosis.[2,3]

Cutaneous TB is one of the less common clinical forms of TB accounting for approximately 1 - 2% of total extra-pulmonary cases but contributes to significant morbidity. Its global resurgence parallels the increasing incidence of pulmonary TB and emergence of multidrug resistance. The diverse clinical presentation of cutaneous TB includes warty plaques, infiltrated plaques with scarring, inflammatory papules, suppurative nodules, chronic ulcers, necrotic lesions and non-inflamed clusters of papules amongst others. Mycobacterium tuberculosis, Mycobacterium bovisare common pathogens. BCG vaccine can also cause Cutaneous TB.

So this present study was conducted to study the clinico-epidemiology of cutaneous TB attending at a tirtiary level hospital of Rajasthan (India).

II. METHODOLOGY

This case-series type of study was conducted in the Skin OPD of the Hospital over a period of eighteen months spanning from January 2015 to August 2016were included in the study. Ethical clearance was obtained from institute's Research review board and written informed consent was taken from all patients prior to data collection.

Sixty patients with suspected Cutaneous TB were included in the study. Detailed clinical history, prior history of TB and ATT, demographic data were recorded from each patient. Dermatological examination and systemic examination were done in all the patients. The presence of systemic complaints of TB such as fever, cough, haemoptysis, weight loss and night sweats were enquired.

A skin puch biopsy was taken from the skin lesions with aseptic precautions and sent in formalin to the department of Pathology of the same institute where they are further processed and embedded in paraffin. Then different sections were cut and stained with haematoxylin and eosin (H & E) stain and examined. They were defined as Cutaneous TB when typical tuberculoid granuloma consisting of epithelioid cells, lymphocytes, Langhans giant cells and caseous necrosis depending upon the host-immune interaction were seen on histo-pathological examination.

Blood investigations like complete haemogram, erythrocyte sedimentation rate (ESR), liver function test and renal function test, Mantoux test and chest X-ray were done in all patients. Fine needle aspiration cytology, sputum examination and other radiological tests were done in relevant cases to look out for underlying evidence of systemic TB focus.

Observations observed in various heads were analysed and presented to study the cilico-epidemiology of these cases. Qualitative data were expressed in percentage and quantitative in mean ± SD.

III. RESULT

Out of the total 60 cases, 45 (75%) were found to have Cutaneous TB on histopathology. The most common form of Cutaneous TB found was Lupus vulgaris (42.2%) followed by Scrofuloderma (37.8%) and Tuberculosis verrucosa cutis (Figures 1& 2). And clinical presentations were seen in figure 3

Figure 1

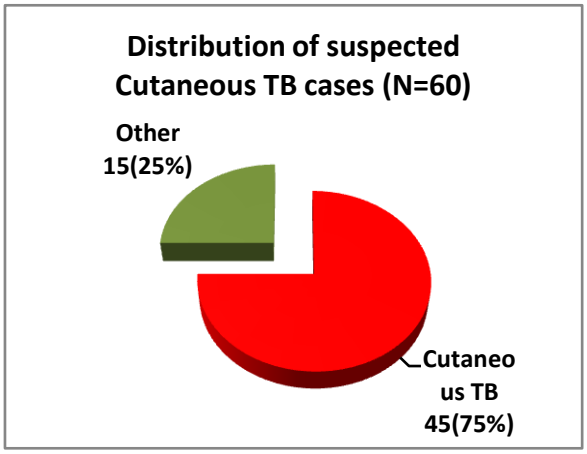


Figure 2

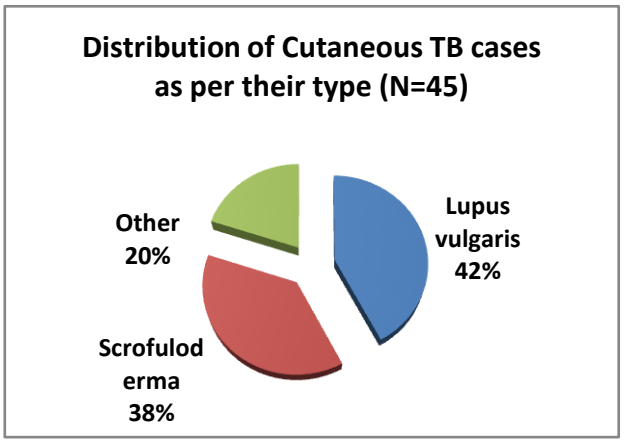


Figure 3

Lupus vulgaris presenting over buttock as plaque with atrophic scarring and progressive edge

Scrofuloderma presenting over neck as multiple nodular swellings with purulent discharge

Tuberculosis verrucosa cutis presenting over right foot as an asymptomatic verrucous warty plaque

Tuberculous gumma in a malnourished child presenting with multiple cold abscess over trunk

A single case of Tuberculous Gumma was seen in a young malnourished child with multiple abscess formation over trunk and limbs (Figure 4). No other forms of Cutaneous TB and tuberculids were reported in the study.

The majority of the cases were in the age group of 11 to 30 years ranging from 5 years to 60 years of age. The mean age was 28.3 ± 13.5 years. Male to female ratio was 1.6:1. The duration of disease ranged from 1 month to 10 years with a mean duration of 2.6±2.8 years. The most common sites of

involvement were lower limbs and neck with 60% of cases showing lesions on extremities (Table 1).

Table 1
Cutaneous TB: types & sites of presentation

Types of Cutaneous TB	Head & Neck	Lower limb	Trunk	Upper limb	Grand Total
Gummatous TB	0	0	1	0	1
Lupus vulgaris	6	7	1	5	19
Scrofuloderma	9	3	1	4	17
Tuberculosis verrucosa cutis	0	5	0	3	8
Grand Total	15	15	3	12	45

In the remaining four cases, the granulomas were ill-defined and they clinically presented as tuberculosis verrucosa cutis in three cases and scrofuloderma in one case. (Table 2)

Table 2
Clinical parameters of cutaneous TB cases

Diagnosis	Total cases	Mantoux results(>/=15mm)	Chest X-ray findings of TB	Systemic complaints of TB	Family history of TB
Gummatous TB	1	0	1(%)	1(%)	1(%)
Lupus vulgaris	19	15(78.9%)	1(5.3%)	0	0
Scrofuloderma	17	9(52.9%)	3(17.6%)	2(11.8%)	2(11.8%)
Tuberculosis verrucosa cutis	8	6 (75%)	0	0	1(12.5%)
Total	45	30(66.7%)	5(11.1%)	3(6.7%)	4(8.9%)

Most of the cases of Scrofuloderma were seen at the neck which maybe secondary to TB of cervical lymph nodes. Majority of the cases belonged to the low socio-economic status group and most of them were students residing in urban areas. Labourer's group was the second most common group of people affected in the study. study. study.

The results of Mantoux test were found to be greater than or equal to 15 mm induration in thirty cases (66.7%) measured after 48-72 hours. study.

All the cases enrolled were investigated with chest x-ray to look out for the evidence of primary pulmonary TB and secondary pulmonary TB. Five cases (12.5%) were found to have evidence of post-TB sequelae i.e. secondary pulmonary TB. The findings were consolidation, fibrotic bands and old cavitary lesions. None of the patients had evidence of primary pulmonary TB. study.

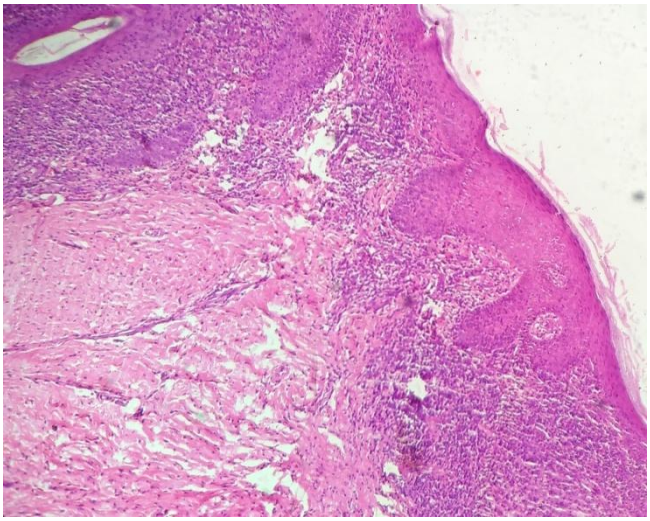
Systemic complaints of TB were found in three cases (7.1%). Weight loss was seen in two patients and fever, cough in one patient. Sputum examination done in these patients was found to be negative. Family history of TB was found in four cases (8.9%). study.

Typical tuberculoid granuloma consisting epithelioid cells, lymphocytes and langhan’s giant cells along with caseous necrosis, depending upon the host immune interaction were the parameters observed in histopathology. But not all the features are found at a time as it depends upon the host’s ability to

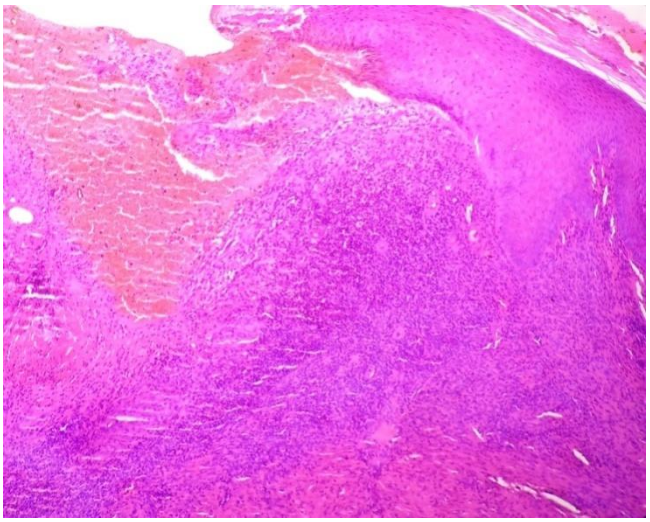
organize the granulomatous process. The clinicopathological concordance was observed to be 91.1% i.e. typical tuberculoid histo-pathological features were observed in forty one cases (Figure 4).

Figure 4

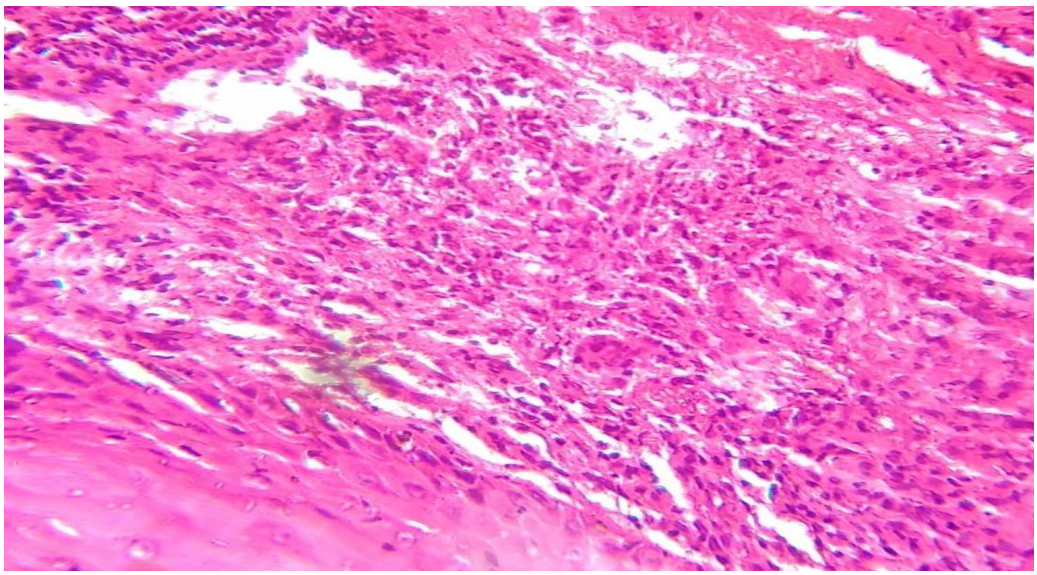
Confluent epithelioid granulomas in the dermis with dense lymphoplasmacytic infiltrate in a lupus vulgaris. Haematoxylin (H) & Eosin (E) staining, 10x magnifications



Dense infiltration by acute & chronic inflammatory cells along with dispersed epithelioid cell granulomas and langhans' giant cells with focal necrosis in a case of scrofuloderma. H & E staining, 10x magnifications



Dermis showing clusters of epithelioid cells with langhans' giant cells surrounded by neutrophils and lymphocytes in a case of tuberculosis verrucosa cutis. H & E staining, 40x magnifications



IV. DISCUSSION

Cutaneous TB can be acquired either exogenously or endogenously and can show a wide spectrum of morphology. These lesions include tuberculous chancre, tuberculosis verrucosa cutis, lupus vulgaris, scrofuloderma, orificial tuberculosis, miliary tuberculosis, metastatic tuberculosis abscess. The tuberculids like true cutaneous tuberculosis also show a spectrum of morphological presentations which include lichen scrofulosorum, erythemainduratum of Bazin, papulo-necrotic-tuberculid and nodular

granulomatous phlebitis.[4] In India cutaneous tuberculosis constitute about 0.1% to 2% of total skin diseases attending outpatients.[5]

The commonest form of Cutaneous TB observed in the present study was Lupus vulgaris which was similar to previous studies by Kumar et al,[6] Puri,[7] Suthar et al.[8] But in another study by Kumar et al[5] the most common form found was scrofuloderma. Few other studies had also reported scrofuloderma as the commonest form including that by Pandhi et al[9] and Vashisht et al.[10] In a study by Dwari et al,[11] tuberculosis verrucosa cutis was found to be the commonest form. This difference may be due to different geographical location or occupation of study subjects.

Majority of the cases in this study were in the age group of 11-30 years which is similar to previous studies by Vashisht et al[10] and Dwari et al.[11] The age of the cases ranged from 5 years to 62 years with a mean of 28.3 ± 13.5 years. In a previous study by Suthar et al [8] the age ranged from 6 years to 70 years with a mean of 27.8 ± 16.2 years. In an another study by Solis et al[12] the age ranged from 15 years to 70 years with a mean of 32.5 ± 18.8 years. In both the above studies there was female preponderance whereas in present study, male patients (62.2%) outnumbered the female patients (37.8%). Dwari et al[11] also observed that male patients out-numbered the female patients same.

The observation in present study that Cutaneous TB presenting more in adolescents and young adults and males may be due to the fact that they are more prone to the infection due to increased outdoor activities. The duration of disease in the present study ranged from 1 month to 10 years with a mean value of 2.6 ± 2.8 years whereas in other studies by Puri[7] it ranged from less than 6 months to more than 2 years with majority of the patients having disease duration between 6-12 months. Pandhi et al[9] also observed the disease duration ranging from 1 month to 6 years. The late presentation of most of the cases may be due to the fact that the skin lesions of Cutaneous TB are mostly asymptomatic and health seeking behavior varies from community to community. Majority of the cases in this study presented with skin lesions of cutaneous TB over lower extremities which is similar to the studies by Puri,[7] Dwari et al[11] & Spelta et al.[13] In addition presentation over neck was also seen in similar proportion as lower extremities in this study.

In present study most of the lupus vulgaris cases were present over the extremities and tuberculosis verrucosa cutis lesions occurred predominantly on lower limbs especially over the feet which is consistent with the observation of Umapathy et al.[14] This may be due to the fact that they present in more trauma prone sites and were seen commonly in the labourers' group. The positivity of Mantoux test in this study was 66.7%. The cutoff value considered was an induration of ≥ 15 millimeter measured after 48-72 hours. In a study by Thakur et al,[15] using the cutoff value as ≥ 15 millimeter they observed positivity of 83.33%. Kumar et al[5] observed a positivity rate of 94.7% with a cutoff value as ≥ 10 millimeter. They also observed differences in cases of localized and disseminated disease with positivity reaching upto 91.8% for localized disease against 50% for disseminated disease. However in another study by Kumar et al [6] there was no significant differences observed between localised disease and disseminated disease (63.6% vs 67.9%).

Ramam et al[16] concluded that the Mantoux test is not a particularly useful test in resolving diagnostic difficulty in Cutaneous TB. Furthermore there are issues with Mantoux test such as differences observed in the vaccinated vs. unvaccinated individuals, endemic areas, individuals with clear immune-suppression requiring a lower cutoff value of 5 millimeter. In the present study the Mantoux test positivity was observed more in cases with good immunity such as lupus vulgaris (78.9%) and

tuberculosis verrucosa cutis (75%) against scrofuloderma (52.9%) which is consistent with the observation of Sehgal et al.[17]

The clinic-pathological concordance observed in this study was 91.1% whereas in the previous studies by Vashisht et al,[10] Pandhi et al[9] and Singal et al[18] it has been observed to range from 64% to 85.6%. Dwari et al[11]and Umapathy et al[14]observed higher clinic-pathological concordance of 94% and 88% respectively. In the present study, classical tubercular histology was observed more in the lupus vulgaris cases (100%) followed by scrofuloderma (94.1%) and tuberculosis verrucosa cutis (62.5%). Thakur et al[15] in their clinic-pathological study of cutaneous TB, found that characteristic tuberculoid granulomas were seen in 72.22% cases of lupus vulgaris, 42.86% cases of scrofuloderma and all cases of tuberculosis verrucosa cutis and lichen scrofulosorum. In another study by Kumar et al[5]classical tuberculous histology was seen in 80% cases of lupus vulgaris, 47.5% cases of scrofuloderma, 100% cases of tuberculosis verrucosa cutis and the remaining fifteen cases closely mimicked lesions of Cutaneous TB but they were diagnosed histo-pathologically as discoid lupus erythematosus in two cases, one case each of sarcoidosis, deep fungal infection, cutaneous leishmaniasis, leprosy, foreign body granuloma, squamous cell carcinoma, lichen planus, and non-specific chronic inflammation in six cases.

V. CONCLUSION

This present study concludes that Lupus vulgaris was the most common form of Cutaneous TB observed in this study. Extremities were the most common site of presentation. Cutaneous TB may present with different morphological patterns resembling various inflammatory, infective and neoplastic conditions. Proper history, thorough clinical examination & investigations should be undertaken to detect the cases so that they are not missed as, specially in countries like India where the annual incidence of TB is high.

CONFLICT OF INTEREST

None declared till now.

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