DOI: 10.7241/ourd.20134.117

NASZA DERMATOLOGIA Online
OUR DERMATOLOGY Online

CUTANEOUS TB PROFILE IN NORTH WEST PUNJAB, INDIA: A RETROSPECTIVE DATA ANALYSIS

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Source of Support:
Nil
Competing Interests:
None

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Our Dermatol Online. 2013; 4(4): 458-461 Date of submission: 22.07.2013 / acceptance: 30.08.2013

Abstract
Introduction: Previous studies from India concluded that the incidence of cutaneous tuberculosis has fallen from 2% to 0.15%, whereas more recent reports suggest that cutaneous tuberculosis is again becoming more prevalent.
Aims: To study the patterns of clinical presentation of cutaneous tuberculosis, to correlate them with histopathology, Mantoux reactivity and BCG vaccination status in the north-west region of Punjab.
Methods: Analysis of the records of patients with cutaneous tuberculosis who attended the hospital between Jan 2009 to Dec 2012.
Results: A total of 36 (0.02%) of dermatology patients had cutaneous tuberculosis. The type of cutaneous tuberculosis in decreasing order of incidence was lupus vulgaris 16 (44.44%) followed by tuberculosis verrucosa cutis 10 (27.77%), scrofuloderma 7 (19.44%) and tuberculids 3 (8.33%). There were no cases of erythema nodosum or miliary tuberculosis. Multiple sites were involved in 17 (47.22%) patients. Face and neck were the most common sites affectedMost of the patients (52.77%) presented with single lesion. Active tuberculosis in other organs were observed in 8 (22.22%) patients. Mantoux test was positive in 23 (63.88%). BCG scar was present in 23 (63.8%) patients. 29 cases (80.55%) showed characteristic histopathological changes of cutaneous tuberculosis.
Conclusions: The incidence of cutaneous tuberculosis in the present study was found to be 0.02% which is far lower as compared to previous reports. Reason for this observation could be the effective implementation of the National Program for tuberculosis at primary and secondary level leading to early diagnosis and treatment, hence lesser number of cases reaching to a tertiary center. This study also depicts the histopathological correlation evident in 80.55% of the histopathological specimens which is highly significant.

Key words: cutaneous tuberculosis; histopathology; Mantoux test; BCG

Cite this article:
Tejinder Kaur, Alpna Thakur, Kritika Pandey, Suresh Kumar Malhotra, Karan Jit Pal Singh Puri: Cutaneous TB profile in North West Punjab, India: a retrospective data analysis . Our Dermatol Online. 2013; 4(4): 458-461.

Introduction

Tuberculosis is a disease of antiquity. Mycobacterium, the organism responsible was identified about 100 years ago, vaccine and chemotherapy are available for over 50 years. Despite the availability of effective diagnostic tools and treatment, the number of new cases of tuberculosis is rising again [1]. About 1/3rd of the world's population has latent *M. Tuberculosis* infection. And 5-10 % of those having latent infections develop symptomatic infection, but the risk of developing the clinical manifestations of the disease is greatly increased by HIV co-infection [2]. The rise in cases of tuberculosis may be attributed to the emergence of (MDR-TB) Multidrug resistance tuberculosis and (XDR-TB) extensively drug resistance tuberculosis. With the advent of the AIDS epidemic and the introduction of immunosuppressive agents, the incidence of (NTM) non-tuberculous mycobacterial associated disease has increased dramatically [3]. Early studies from India concluded that the incidence of cutaneous tuberculosis has fallen from 2% to 0.15% [4], whereas more recent reports suggest that cutaneous tuberculosis is again becoming more prevalent [5]. Diagnosis of cutaneous TB is challenging as its manifestations are varied, typical dermatologic lesions are rare, and the bacterium is seldom identified by staining or culture. Cutaneous tuberculosis can present with unusual clinical and histopathological features causing delay in diagnosis. Strong clinical suspicion, family history of pulmonary/extrapulmonary TB, a positive Mantoux test and histopathological features aid the diagnosis.

Materials and Methods

This was a retrospective data analysis where the data of 4 years duration from Jan 2009 to Dec 2012 was analyzed. The detailed history regarding age, sex, occupation, education, marital status and socioeconomic class was analyzed. History of trauma was taken into consideration.

Materials and Methods

Data regarding general and systemic examinations in addition to dermatological examination for evidence of tuberculosis elsewhere in the body was taken. Reports of smear from the affected area and sputum for acid-fast bacilli, chest X-Ray, routine haemogram with ESR, Mantoux test, and histopathological examination were retrieved.

Results

The demographic profile of the patients is shown in Table I. During the 48 months of our study 36 patients were found to be suffering from cutaneous tuberculosis out of approx 1,80,000 patients with skin diseases attended the skin OPD, giving an incidence of 0.02%. The age varied from 4 to 85 years, the majority of patients belonged to younger age groups (16 - 30 years) comprising 36.11% of total patients. In 8 cases (22.22%) disease was noted to appear before the age of 15 years. Among adults there were 15 (41.66%) female patients and 12 (33.33%) male patients giving female to male ratio of 5:4. Among children 4 (11.11%) were male and 5 (13.88%) were female. The duration of disease varied from 4 months to 5 years.

Demographic feature	No. of patients (n=36)	%
Age		
0-15	8	22.22
16-30	13	36.11
31-45	7	19.44
46-60	6	16.66
>60	2	5.55
Sex		
Male	12	33.33
Female	15	41.66
Male child	4	11.11
Female child	5	13.88
Rural/ Urban		
Rural	13	36.11
Urban	23	63.88

Table I. Demographic profile of the study cases.

The type of cutaneous tuberculosis in decreasing order of incidence was lupus vulgaris 16 (44.44%) followed by tuberculosis verrucosa cutis 10 (27.77%), scrofuloderma 7 (19.44%) and tuberculids 3 (8.33%). There were no cases of erythema nodosum or miliary tuberculosis. Multiple sites were involved in 17 (47.22%) patients. Face and neck were the sites affected in 15 (41.66%) patients; trunk in 11, buttocks in 5, legs in 4, hand in 3 and foot in 2 patients, (Fig. 1).

Mantoux test was positive in 23 (63.88%) with an induration > 10mm, and negative in the remaining. BCG scar was present in 23 (63.8%) patients. Biopsy reports of 29 cases (80.55%) depicted characteristic histopathological changes of cutaneous tuberculosis. In rest of cases (19.44%) the histopathological features were non-specific. Active tuberculosis in other organs (Lung, bone and lymph nodes) was observed in 8 (22.22%) patients. All the patients were negative for HIV, (Fig. 2).

All patients were referred to directly observed treatment, short-course (DOTS) center of the institution and were given anti-tuberculosis treatment. Patients showed significant clinical response and in most of the cases healing with scarring within a period of 6-9 months.

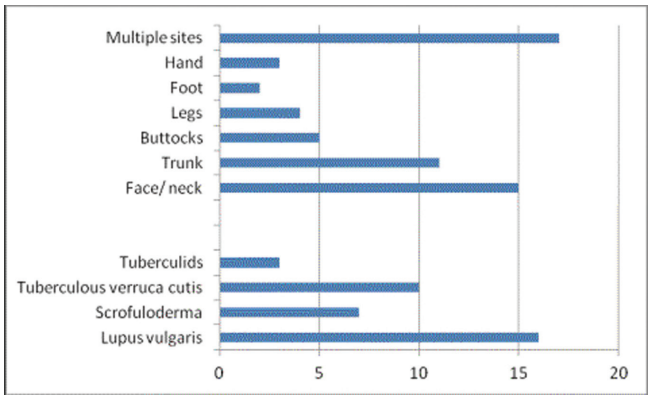

Figure 1. Figure depicting the site and type of cutaneous tuberculosis among study cases.

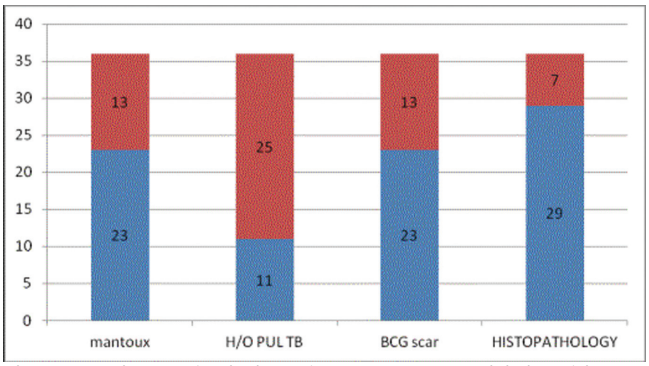

Figure 1. Figure depicting the Mantoux positivity, history of pulmonary tuberculosis, presence of BCG scar and histo-pathological corelation (n=36).

Legends: red colour - Negative; blue colour - Positive

Discussion

The genus *Mycobacterium* contains more than 80 species, most of which are harmless environmental saprophytes. A few species are important pathogens of humans and other vertebrates. The most important obligate human pathogens are *Mycobacterium tuberculosis* and *M. leprae*, but others such as *M. avium* and *M. ulcerans* are also significant.

M. tuberculosis can cause skin infection by direct inoculation into the skin, by haematogenous spread from an internal lesion or by direct contact with tuberculosis in an underlying deeper structure. To date, histopathology testing and isolation of *M. tuberculosis* in culture of skin samples or by PCR have been considered the best diagnostic tools for the detection and diagnosis of cutaneous TB. The definitive criterion for cutaneous TB is the isolation of the bacterium in culture or the identification of mycobacterial DNA by PCR. Unfortunately, few institutions or laboratories can afford this procedure, particularly in developing countries [6].

The wide clinical spectrum of cutaneous tuberculosis is dependent on the route of infection (endogenous or exogenous), the immune status of the patient and whether or not there has been previous sensitization with tuberculosis. *M. tuberculosis* is the main organism responsible for cutaneous tuberculosis.

In the skin, tuberculosis presents itself in an astonishing variety of forms, which has given rise to an unwieldy, overextended number of descriptive terms and bewildering classifications. The potential of the skin to react in many different ways to a single disease agent is nowhere better illustrated than in tuberculosis [7].

Primary inoculation produces tuberculous chancre and tuberculous verrucosa cutis in non-immune and immune host respectively. Lupus vulgaris occurs mainly through haematogenous, lymphatic or contiguous spread. Scrofuloderma results from contiguous involvement of skin overlying tuberculosis in deeper structures, for example lymph node, bone or joint. Metastatic tuberculous abscess (tuberculous Gumma) can occur due to haematogenous spread from primary focus. Ingestion of bacteria from swallowing sputum or milk contaminated with *M. bovis* can result in orificial, perioral or perianal tuberculosis. Tuberculids results from immunological reaction to haematogenous spread of antigenic components of *M. tuberculosis* [8].

The incidence of different forms of cutaneous tuberculosis varies among gender, age group, socioeconomic strata and geographical location globally. The incidence of cutaneous tuberculosis in the present study was found to be 0.02%, which was far lower as compared to previous reports of 0.28% [9] and 0.59% [10]. The duration of disease varied from 4 months to 5 years.

The commonest type of TB was lupus vulgaris in the present study (36%), followed by tuberculosis verrucosa Curtis and scrofuloderma by 32% and 28% respectively. Similar findings have been reported by other authors [10-12]. However, some authors have reported Scrofuloderma to be the most common variety [13,14], while others have reported TVC [11] to be most common.

The minimum incidence was that of tuberculids in our study, as reported by other authors previously [4]. History of pulmonary TB could be elicited in 30.55% of the patients, which was comparable to that reported previously (10% to 45%) [15,16].

In agreement with previous studies, the majority of the Scrofuloderma lesions was located in the neck area (41.66%) [17,18].

Biopsy reports of 29 cases (80.55%) showed characteristic histopathological changes of cutaneous tuberculosis. In 7 cases (19.44%) the histopathological features were non-specific. Early, non-specific inflammatory changes give rise after 3–6 weeks to a characteristic tubercle. The fully formed tubercle consists of a focus of epithelioid cells containing a variable, but usually sparse, number of Langhans' giant cells and a surrounding infiltrate of mononuclear cells. The center of the tubercle undergoes caseation necrosis and sometimes calcifies. Endovascular or perivascular changes in the vicinity of the tubercle become more marked as necrosis proceeds, and are accompanied by a cellular reaction leading to fibrosis. Such granulomas vary greatly in appearance, depending on the virulence of the organism, the size of the inoculum and the immune status of the patient [19].

Conclusion

The incidence of cutaneous tuberculosis in the present study done at a tertiary care center was found to be 0.02% which is far lower as compared to previous reports of 0.28% [9] and 0.59% [10]. Reason for this observation could be the effective implementation of the National Program for tuberculosis at primary and secondary level leading to early diagnosis and treatment, hence lesser number of cases reaching to tertiary center like ours. This study also depicts the histopathological correlation evident in 80.55% of the histopathological specimens which is highly significant.

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