Cutaneous Tuberculosis : A Clinico-morphological Study

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Abstract

Background : Cutaneous tuberculosis forms a small subset of extrapulmonary tuberculosis. The present study is an attempt to observe the clinico morphological pattern seen in cases of cutaneous tuberculosis over a period of 5 years, and to correlate them with mantoux reactivity and human immunodeficiency virus (HIV) status.

Methods : All cases of cutaneous tuberculosis observed among the dermatology in patients and those attending out patient department were included in the study. The basis of diagnosis was clinical, histopathological and microbiological. Intradermal mantoux test and serological test in the form of enzyme-linked immunosorbent assay (ELISA) for tuberculosis was done. HIV screening was carried out in 32 cases. CD4 counts were done in all HIV positive cases.

Results : A total 0.02% patient attending the dermatology centre had cutaneous tuberculosis. The spectrum of infection included 19 (51%) cases of lupus vulgaris, 7 (19%) cases of papulonecrotic tuberculids, six cases each of tuberculosis verrucosa cutis and scrofuloderma. One case had scrofuloderma and lupus vulgaris and another both scrofuloderma and papulonecrotic tuberculide. One case of lichen scrofulosorum was seen in a seven year old boy. 11 cases revealed evidence of systemic tuberculosis. Seven cases of HIV with CD4 counts between 50-500 cells/ μ l were observed in this study.

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Key Words: Cutaneous tuberculosis; HIV status

Introduction

With the improvement of living conditions and the introduction of effective treatment, the number of reported cases of tuberculosis have declined. The invasion of the skin by *Mycobacterium tuberculosis* has become rare in developed countries but is seen in developing countries. The incidence of cutaneous tuberculosis had fallen from 2% to 0.15% [1]. Extra pulmonary tuberculosis has now shown resurgence because of human immunodeficiency virus (HIV) infection. Cutaneous tuberculosis may show atypical manifestations in the presence of HIV infection.

This study included the epidemiology, most frequent morphological forms, course of disease and its correlation to Mantoux reactivity.

We describe the clinical, histopathologic, and bacteriologic findings of 33 patients with different forms of cutaneous tuberculosis.

Material and Methods

All cases of cutaneous tuberculosis observed among the in patients and those attending out patient department were included in the study.

The diagnosis was based on clinical features, histopathology (haematoxylin-eosin and Ziehl-Neelsen stains) and microbiology of the tissue smears and in case of discharging sinuses the tissue exudate. Intradermal mantoux

test was done. Enzyme linked immunosorbent assay (ELISA) for tuberculosis was performed in 26 cases. The clinical presentation and investigations were recorded and interpreted according to Beyt's classification [2]. HIV screening was carried out in 32 cases and CD4 counts done in all HIV positive cases.

All cases were subjected to a mantoux test and the results graded as nil (no induration), negative (induration <10 mm in HIV negative and <5 mm in HIV positive), positive (induration >10 mm in HIV negative and >5 mm in HIV positive), strongly positive (induration >20 mm in HIV negative and >10 mm in HIV positive).

Results

A total of 37 cases of cutaneous tuberculosis, were observed in a patient population of 1,52,000 (0.024%) over a period of five years from 1999 to 2004. This study comprised 8 females (22%) and 29 males (78%).

The spectrum of infection included 19 (51%) cases of lupus vulgaris (Fig. 1), 7 (19%) cases of papulonecrotic tuberculids, six cases each of tuberculosis verrucosa cutis (Figs. 2 & 3) and scrofuloderma. One case had scrofuloderma and lupus vulgaris and another both scrofuloderma and papulonecrotic tuberculide. One case of lichen scrofulosorum in a seven year old boy was seen (Fig. 5). 14 (38%) cases revealed evidence of tuberculosis elsewhere in the body. Five cases of scrofuloderma were associated with tuberculous lymphadenitis and one with tuberculous osteomyelitis of the calcaneum. All patients were placed on antitubercular therapy

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Fig. 1 : Lupus vulgaris; Pre and post treatment

Fig. 2 : Tuberculosis verrucosa cutis (TVC) pretreatment with strong positive mantoux and post treatment (inset)

Fig. 3 : Tuberculosis verrucosa cutis pre and post treatment

Fig. 4 : Papulonecrotic tuberculids in HIV positive patient

Fig. 5 : Lichen scrofulosorum

with an initial phase of rifampicin, isoniazid, ethambutol and pyrazinamide for two months followed by rifampicin and isoniazid. Most cases showed complete resolution on treatment in six months. In those, with associated systemic tuberculosis and HIV infection the duration of treatment was dictated by the systemic manifestation despite resolution of the cutaneous manifestations.

Of the 37 cases, 32 were screened for HIV infection and seven cases tested positive for HIV. Two cases each of papulonecrotic tuberculids (Figs. 4 & 6), lupus vulgaris and scrofuloderma tested positive for HIV. One patient displayed both scrofuloderma and papulonecrotic tuberculide (Fig. 7). CD4 counts were done in all seven cases.

All cases were subjected to a mantoux test. 27 cases were

Fig. 6 : HIV with papulonecrotic tuberculids

Table 1

CD4 counts of cases of cutaneous tuberculosis with associated HIV infection

Case No.	Morphology	CD4 count (cells/ μ l)
6	Lupus vulgaris	434
8	PNT	320
11	PNT	260
21	Scrofuloderma	313
32	Lupus vulgaris	107
33	Scrofuloderma	100
36	Scrofuloderma PNT	51

reactive to the intradermal skin test. Nine cases were non reactive with five cases showing no reaction at all. Of the 24 positive cases, seven cases showed a strong positive reactivity. Among the HIV positive patients six were mantoux positive.

On histopathology, most specimens showed epithelioid granulomas. In lupus vulgaris the findings consisted of epithelioid granulomas without caseation necrosis. Variable degree of epidermal hyperplasia was also present in some cases. Acid-fast bacilli were not seen. Specimens of scrofuloderma showed epithelioid granulomas with areas of caseation necrosis and acid-fast bacilli could be demonstrated in two cases of scrofuloderma.

Discussion

Cutaneous tuberculosis has a worldwide distribution. Though human disease with *M tuberculosis* and *M bovis* is usually spread by droplets and the portal of entry is the respiratory tract, occasionally skin can also be primarily involved. Lupus vulgaris occurs mainly in patients with moderate or high degree of immunity. The lesion arises due to inoculation by exogenous source and by haematogenous spread. Scrofuloderma manifests after the breakdown of the skin overlying a tubercular focus, usually a lymph node but sometimes an infected bone or joint. A patient with moderate or high degree of immunity can develop tuberculosis verrucosa cutis if accidental superinfection from extraneous source and

Fig. 7 : HIV with scrofuloderma

autoinoculation or post-traumatic inoculation with infected sputa occurs.

The incidence of cutaneous tuberculosis has been reported from 0.1 to 1% of all the cutaneous disorders [3,4]. In this study, of the 152,000 patients, 37 (0.02%) manifested features of cutaneous tuberculosis. The percentage of patients manifesting cutaneous tuberculosis could be on the lower side due to the large population base as compared to the above studies. Lupus vulgaris [3-5] and scrofuloderma [1,7] have been reported as the commoner form of cutaneous tuberculosis world wide. In this study lupus vulgaris was the commonest. Isolation of acid fast bacilli (AFB) is uncommon in cases of lupus vulgaris [8,9]. AFB was not isolated in any of the cases. Lupus vulgaris has been reported as usually resulting from a reinfection of the skin in persons with a high degree of tuberculin sensitivity [10] and in most, it occurs after haematogenous, lymphatic, or direct spread from visceral tuberculosis. Rarely it presents at the site of primary inoculation [11]. These cases would be expected to exhibit a negative sensitivity to intradermal mantoux test. In this study, 9 (47%) cases of the 19 cases of lupus vulgaris showed a negative reaction to mantoux.

Scrofuloderma represents a direct extension into the skin from an underlying tubercular focus, most commonly tubercular lymphadenitis or skeletal tuberculosis. Cervical lymph nodes are infected commonly, although axillary, inguinal, and other lymph nodes can also be involved [12,13]. In this study, six cases of scrofuloderma

were observed of which three had direct extension into the skin from cervical and two from axillary lymphadenitis. In one case, skin involvement resulted from osteomyelitis of calcaneum. Tuberculin skin tests were positive.

The term tuberculid is applied to any of a group of eruptions which arise in response to an internal focus of tuberculosis and clears with antitubercular therapy. Papulonecrotic tuberculids consists of recurring crops of symmetrical, hard, dusky-red papules. They crust or ulcerate, leaving pigmented, sometimes atrophic, scars, over the course of a few weeks. Papulonecrotic tuberculids have been reported uncommonly in the literature [14]. In this study we report seven such cases, three cases were associated with HIV infection of which two had disseminated tuberculosis and one had tubercular pleural effusion. One case with disseminated tuberculosis presented with both tuberculides and scrofuloderma. The duration varied, with one case reporting persistence for 4 months, while the other had the eruption of lesions for a period of 1 month. Both responded well to antitubercular therapy with lesions subsiding in 4 to 6 weeks. One case was associated with tubercular arthritis of the hip joint and had lesions over the buttocks and low back. Another case had persistence of lesions for a period of 10 years, with recurrent crops of lesions, healing with atrophic scarring. The diagnosis of papulonecrotic tuberculids (PNT) in this case was based on the histopathological findings and a persistently high IgG and IgM ELISA titres for tuberculosis. A search for systemic focus of infection was not fruitful and he showed complete remission in 6 months, however his antitubercular therapy was continued for a period of 9 months. A follow up after 2 years has not revealed any recurrence of lesions and IgM ELISA titre was negative on follow up.

Individuals infected with the HIV are at an increased risk of both pulmonary and extrapulmonary tuberculosis. Disseminated cutaneous tuberculosis is rare in HIV infection [15] and few cases of papulonecrotic tuberculids [14] and disseminated miliary tuberculosis have been reported. In this study of the 32 cases 7 (22%) tested positive. Three cases had papulonecrotic tuberculids, two had lupus vulgaris and other two scrofuloderma. CD4 counts ranged between 50- 500 cells/ μ l. Cases of disseminated miliary tuberculosis reported in HIV had a CD4 count less than 100 cells/ μ l [16]. Therefore it is felt, that the mere appearance of cutaneous tuberculosis by itself may not signify a high degree of immunosuppression.

Mantoux reactivity has been variously reported in literature with reference to cutaneous tuberculosis [3,17]. In this study 27 (73%) cases showed a positive reaction.

The negative status of patients of lupus vulgaris could reflect a primary inoculation in these cases. All six cases of tuberculosis verrucosa cutis showed a positive mantoux with two cases showing a strong positive result. Among the HIV patients, six cases were positive. A case of lupus vulgaris also showed a strong reaction with ulceration and had a CD4 count of 107/ μ l.

Conflicts of Interest

None identified

References

1. Sehgal VN, Srivastava MD, Khurana VK, et al. An appraisal of epidemiologic, clinical, bacteriologic, histopathologic and immunologic parameters in cutaneous tuberculosis. *Int J Dermatol* 1987; 26:521-6.
2. Beyt E, Ortbalas DW, Santa Cruz DJ, et al. Cutaneous mycobacteriosis: analysis of 34 cases with a new classification of the disease. *Medicine* 1980; 60:95-109.
3. Kumar B, Muralidhar S. Cutaneous tuberculosis: a twenty-year prospective study: *Int J Tuberc Lung Dis* 1999; 3:494-500.
4. Suarez Martin E. Etiopathogenia de las tuberculosis cutaneas: *Actas Dermo-Sif* 1978; 69:349-63.
5. Marcoval J, Servitje O, Moreno A, Jugla A, Peyri J. Lupus vulgaris. Clinical, histopathologic, and bacteriologic study of 10 cases. *J Am Acad Dermatol*. 1992 ;26:404-7.
6. Savin JA. Mycobacterial infections. In: Champion RH, Burton JL, Ebling FJG, editors. *Textbook of dermatology*. 5th ed Oxford: Blackwell Scientific Publications 1992:1033-63.
7. Yates VM, Ormerod LP. Cutaneous tuberculosis in Blackburn district (UK): a 15-year prospective series, 1981-95. *Br J Dermatol* 1997; 136 : 483-9.
8. Duhra P, Grattan CEH, Ryatt KS. Lupus vulgaris with numerous tubercle bacilli. *Clin Exp Dermatol* 1988; 13:31-3.
9. Serfling U, Penneys NS, Leonardi CL. Identification of *M tuberculosis* DNA in a case of lupus vulgaris. *J Am Acad Dermatol* 1993; 28 : 318-22.
10. Brown FS, Anderson RH, Burnett JW. Cutaneous tuberculosis. *J Am Acad Dermatol* 1982; 6 : 101-6.
11. Helletrom S. Collected cases of inoculation lupus vulgaris. *Acta Derm Venereol (Stockh)* 1951; 31 : 194-6.
12. Scrofula today [Editorial]. *Lancet* 1983; 1:385-6.
13. Sehgal VN, Sooneita AW. Cutaneous tuberculosis: current concepts. *Int J Dermatol* 1990; 29 : 237-52.
14. Cuende E, Almeida V, Portu J, et al. Poncet's disease and papulonecrotic tuberculid in a patient infected with the human immunodeficiency virus: *Arthritis Rheum* 1998; 41:1884-8.
15. Corbett EL, Crossley I, De Cock KM, Miller RF. Disseminated cutaneous mycobacterium tuberculosis infection in a patient with AIDS. *Genitourin Med* 1995; 71:308-10.
16. Esquivel SP, Vigna L, Velazquez J, et al. Disseminated tuberculosis with cutaneous manifestations in AIDS patients. Presentation of 4 cases; *Enferm Infecc Microbiol Clin* 1998 Jan; 16:31-4.
17. Fenniche S, Ben Jennet S, Marrak H, et al. Cutaneous tuberculosis: anatomoclinical features and clinical course. *Ann Dermatol Venereol* 2003 Nov;130:1021-4.