

Association of Pulmonary Tuberculosis and Dermatological Conditions Among Patients of a Rural Medical College Hospital

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ABSTRACT

Introduction. Pulmonary tuberculosis (PTB) affects a significant proportion of the population. There are many contributory aetiological factors common to tuberculosis (TB) and dermatological conditions.

Aim. To study the spectrum of concurrent skin conditions in patients with PTB and to compare with patients having other diseases.

Methods. All patients with PTB admitted to our Institute during the period of the study were included in the study. A comparable number of patients admitted in other departments constituted the control group. All patients were screened for skin diseases.

Results. There were 498 patients in each group, matched for age and gender. There were 126 patients with skin conditions in the study group as against 60 patients in the control group. Pityriasis versicolor was the commonest skin condition in both the groups. Whereas acniform eruptions and pruritis were more common in the control group. Pityriasis versicolor, herpes zoster, erythema nodosum and leprosy were significantly more frequent among patients.

Conclusion. There is a high frequency of concurrent skin diseases in patient with PTB that should be managed along with it. [Indian J Chest Dis Allied Sci 2013;55:201-204]

Key words: Pulmonary tuberculosis, Pityriasis versicolor, Psoriasis, Erythema nodosum, Herpes zoster.

INTRODUCTION

Pulmonary tuberculosis (PTB) is a common infectious disease and a major cause of illness and death throughout the world, particularly in developing countries. Overall, one-third of the world's population is currently infected with the tuberculosis (TB) bacillus. The concomitant occurrence of both TB and other associated skin conditions in individuals are not uncommon but has been reported infrequently in the literature.¹

There are four kinds of association of dermatological conditions with TB: (1) skin TB, (2) tuberculids, (3) drug reaction to anti tubercular drugs, and (4) unrelated, co existent skin conditions.

Since many of the contributory aetiological factors including immune deficiency, lower socio-economic status and malnutrition are common to TB and dermatological conditions,² we have attempted to study the pattern of co-existence of these conditions.

MATERIAL AND METHODS

The study was approved by the Institutional Ethics Committee. All patients with PTB admitted to our Institute during the 18 months period from December 2010 to May 2012 were included in the study group. Tuberculosis was diagnosed on the basis of sputum examination and chest radiograph. All patients were screened for dermatological conditions and treated as per Dermatologist's advice. Leprosy was diagnosed on the basis of criteria of the National Leprosy Eradication Programme. Slit skin smear was done in all cases. Erythema nodosum was primarily diagnosed clinically. Biopsy was done in one case only. The patients were followed-up even after discharge for treatment of their skin conditions.

The control group consisted of similar number of patients admitted to other departments for non-tuberculous conditions. They were also screened for dermatological conditions. Patients with primary skin conditions were not excluded. The two groups were compared using the student's t test and Chi square test.

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RESULTS

There were a total of 498 patients in the study group. Out of these 438 patients had sputum positive PTB and the remaining were diagnosed by chest radiograph. A similar number of age- and gender-matched patients were there in the control group.

There were 301 males (60.4%) among patients with TB and 239 (54.6%) males in the control group ($p>0.05$). The mean age of patients in the study group was 47.0 ± 9.9 years while it was 48.3 ± 11.9 in the control group ($p>0.05$).

There were a total of 126 patients with dermatological conditions in the study group, while in the control group there were 60 such patients. The spectrum of these conditions is shown in the table. Pityriasis versicolor was the commonest skin condition noted in both the groups.

Table. Incidence of various skin conditions in study and control groups

Skin Conditions	Study Group	Control Group	pValue
Pityriasis versicolor	63	21	<0.00003
Scabies	15	12	0.27
Acniform eruptions	9	15	0.11
Non-specific pruritus	9	12	0.25
Herpes zoster	9	0	0.001
Erythema nodosum	9	0	0.001
Borderline lepramatous leprosy	9	0	0.001
Psoriasis	3	0	0.04
Total patients	126	60	<0.00003

There was a significant difference in the incidence of pityriasis versicolor, herpes zoster (Figure 1), erythema nodosum (Figures 2&3) and borderline lepramatous leprosy (Figure 4) between the study and the control group. There was not much difference in the incidence of other conditions, like scabies, acniform eruptions, non-specific pruritus and psoriasis. In fact, acniform eruptions and non-specific pruritus was more common in the control group rather than in the study group.



Figure 1. Clinical photograph of patient of herpes zoster affecting T4 (Patient 12, Study group).

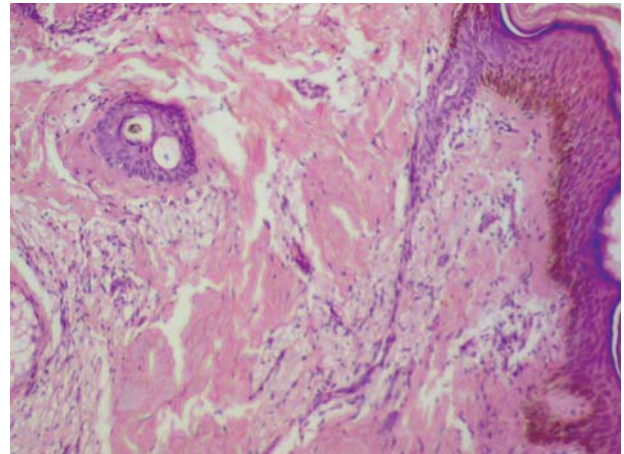


Figure 2. Erythema nodosum; section shows stratified squamous keratinised epithelial lining. There are foci of acute inflammation superimposed on chronic multi-bacillary leprosy. Foamy macrophages containing fragmented bacilli are seen (Haematoxylin and Eosinx40).



Figure 3. Clinical photograph of patient of erythema nodosum (Patient 22, Study group)

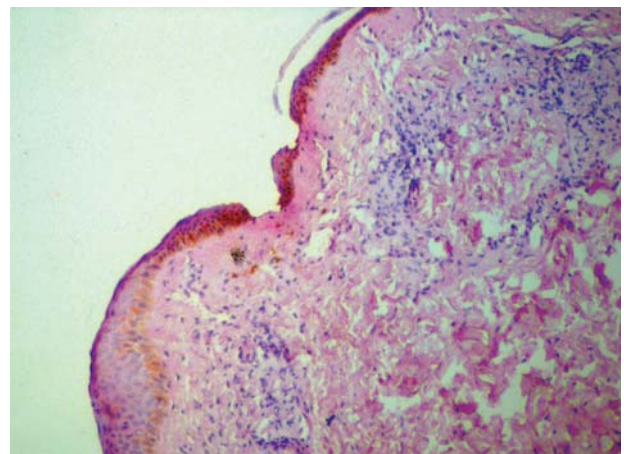


Figure 4. Histopathology section shows stratified squamous keratinised epithelial lining. There are infiltrates of band of lymphocytes and histiocytes suggestive of granulomatous inflammation, probably borderline lepramatous leprosy (Haematoxylin and Eosinx100).

Overall, the skin conditions were more common in patients with TB ($p > 0.5$).

DISCUSSION

Skin may be involved in several different ways in patients with TB. Skin tubercular lesions are seen in less than 1% of patients with TB. Presentation may vary from single to disseminated papules that may be smooth or eruptive, verrucous or vegetative plaques and ulceration. Various forms of cutaneous TB include *Lupus vulgaris*, *TB verrucosa cutis*, *Scrofuloderma*, *ulcerative TB*, *Erythema induratum* and *miliary TB* of skin.

Tuberculids are skin conditions caused by hypersensitivity reaction to *Mycobacterium tuberculosis*. These includes *Papulonecrotic tuberculid* (Acne tuberculid), *Lichen scrofulosorum*, *Erythema induratum*, *Lupus miliaris Disseminatus faciei*, Rosacea-like tuberculid of Lewandowsky and Prosector's wart.⁵

Itching or maculopapular eruptions are common adverse effects with anti-tuberculosis drugs, such as streptomycin, isoniazid, rifampicin, pyrazinamide, thioactazone or para-amino-salicylic acid.⁶ Besides these, certain contributory causative factors are common to TB and dermatological conditions.

Tuberculosis is found to be more common among patients of rural areas and lower socio-economic status, where malnutrition, over-crowding and poor access to medical facilities is common, and in conditions that weaken the immune system such as malnutrition, human immunodeficiency virus co-infection, diabetes mellitus, and prolonged use of steroids.⁷ Like TB, some skin conditions like pityriasis versicolor, scabies, borderline lepromatous leprosy, non-specific pruritus are disorders related to weak immunity. Similar risk factors also increase susceptibility to skin conditions. Pityriasis versicolor, herpes zoster, lepromatous leprosy and erythema nodosum were seen more frequently in patients with TB.

Pityriasis versicolor was the commonest skin condition identified in the study group accounting for 50% of all cases. Incidentally, it was also the commonest condition in the control group too. Pityriasis versicolor is a superficial skin infection caused by the yeast *Malassezia furfur*. Clinically there are multiple hypo- or hyper-pigmented oval to round patches or thin plaques with scales. Potassium hydroxide test and Woods lamp examination of the scales confirms the diagnosis.⁷ Razack and Thambiah⁸ studied 100 patients of Pityriasis versicolor and they found that majority of patients were suffering from TB. Burke⁹ studied the various risk factors for pityriasis versicolor and found that malnutrition and unhygienic practices were important, as these may contribute to development of TB.

Leprosy caused by *Mycobacterium leprae* is a chronic granulomatous disease and it is acquired by aerosol spread. Both TB and leprosy infection have been reported in the same host.¹⁰ Leprosy and TB are endemic in India. Tuberculosis was reported to be the major cause of death in leprosy patients by Grace and Rahman.¹¹ In our study, nine patients had borderline lepromatous leprosy. Similar observations of association of leprosy and tuberculosis was made by others.¹¹

Sarcoptes scabiei (itch mite) is transmitted by close contact with an infected person. It is diagnosed on the basis of nocturnal pruritis and distribution of lesions.⁷ Sharma *et al*¹ found 4 scabies patients out of 19 to have TB and has linked this to the lower socio-economic class where unhygienic life style and lack of good medical care is responsible for both the conditions. In the present study, the conditions occurred with similar frequency in both the groups.

Herpes zoster appears upon reactivation of varicella zoster virus which may occur spontaneously or may be induced by stress, fever, radiation therapy, tissue damage or immunosuppression. Herpes zoster often begins with a prodrome of intense pain and is associated with pruritus vesicles, tingling, tenderness or hyperesthesia.⁷ Verma and Hira¹² reported four cases showing an association between herpes zoster with PTB. The reason for this association may be immunosuppression.

Erythema nodosum is a form of panniculitis and is considered to be a delayed hypersensitivity response to a variety of antigenic stimuli, including bacteria, viruses and chemical agents.⁷ Macpherson¹⁶ has noted 4/53 patients to have erythema nodosum and PTB. Eight patients with normal chest radiograph developed TB on follow-up that was attributed to the use of steroids for the primary condition. In the present study, nine patients out of 498 were diagnosed to have erythema nodosum. Erythema nodosum may be caused by hypersensitivity to the *Mycobacterium*.

Psoriasis occurred with similar frequency in the two groups while acniform eruptions and pruritus were more common in the control group.

CONCLUSIONS

Almost a quarter of patients with TB have concurrent dermatological conditions with pityriasis versicolor, erythema nodosum, herpes zoster and lepromatous leprosy being more common. These conditions should be searched for and managed.

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