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Case Report

Co-infection of Hansen's Disease and Extrapulmonary Tuberculosis: A Rare Case Report

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Hansen's disease is a chronic infectious disease caused by *Mycobacterium leprae* and *Mycobacterium lepromatosis*, primarily affecting the skin and peripheral nerves, with a long incubation period. The association of two of the oldest diseases of mankind, leprosy and tuberculosis (TB), occurring at the same time, has been uncommonly reported in the literature. We report a case of lepromatous leprosy with extrapulmonary tuberculosis. It is important to discuss this coinfection to avoid drug resistance to common drugs and to avoid further complications and morbidity of both the diseases.

Keywords: Leprosy, Extrapulmonary Tuberculosis, Atypical Presentations, Co-infection

Introduction

Leprosy, also known as Hansen's disease, is a chronic granulomatous infectious disease caused by slow-growing bacteria, *Mycobacterium leprae* and *Mycobacterium lepromatosis*, primarily affecting the skin and peripheral nerves (Smith & Saunderson 2010). In the disease spectrum of leprosy, the patient presents with a combination of different types of skin lesions and nerve function impairments, simulating a wide variety of dermatological and neurological diseases (Palit et al 2016).

Tuberculosis (TB) and leprosy, both are caused by *Mycobacterium* spp., are two of the most psychosocially devastating diseases known to mankind. Despite significant advances in medical research, these diseases continue to pose a global health burden. The uncommon association of TB and leprosy is probably based on the transmission dynamics of both infections. *Mycobacterium tuberculosis* (MTB) a culturable, slow growing mycobacterium that causes a range of pulmonary and extrapulmonary manifestations. *M. leprae* on the other hand is still not culturable in any acceptable artificial media (although its genome has been deciphered), and both the diseases together at the same time are less commonly reported in literature. Literature shows that both the MTB and *M leprae* share some antigens and there is a degree of cross-immunity, which may not usually allow both infections to occur at the same point of time in the same host. However, such co-infections do manifest (Nigam et al 1979, Trindade et al 2013) and treating doctors need

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to be alert about such co-occurrence. We are reporting here a case of lepromatous leprosy and extrapulmonary tuberculosis.

Case Report

A 30-year-old male construction worker presented with hypopigmented, hypoaesthetic patches on the body for one year, fever and night sweats for one month, and progressive difficulty in breathing for the past two weeks. A year back patient he noticed hypopigmented patches first over abdomen which gradually increased in size and number to involve whole trunk and both extremities. Simultaneously he developed decreased sensation over both hands and feet.

One month back, he developed intermittent fever with chills aggravating in the evening. Since 2 weeks, he developed breathlessness which was gradually increasing with time and exacerbated on lying down position, However, there was no history of red coloured raised painful nodules over body or any joint pain, redness or watering of eyes, or any redness or pain over existing lesions, difficulty in buttoning shirt, no history of hoarseness of voice, increased size of breast tissue or decreased libido, or any disability.

Further family history revealed, that the patient is unmarried and living with his elder brother since last 15 years. His elder brother's wife and her 13 -year- old son both were suffering from lepromatous leprosy. His elder brother's wife had completed multidrug therapy for leprosy (MB-MDT) and her son had been on MB-MDT for

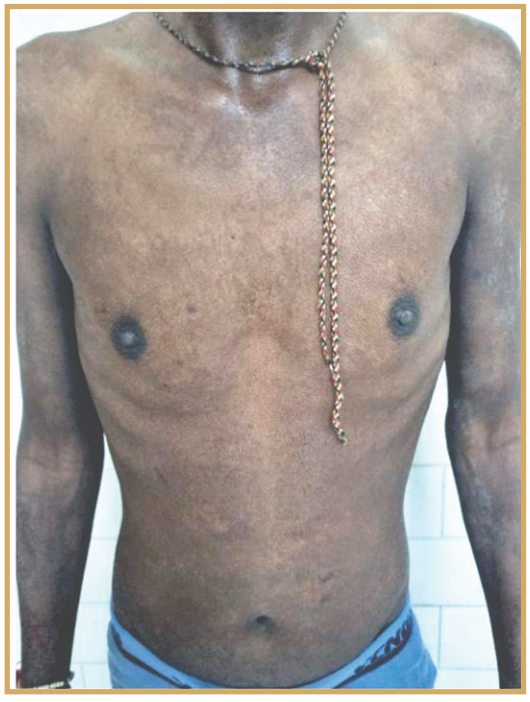

Fig. 1A : Multiple, ill -defined hypopigmented patches seen over chest.

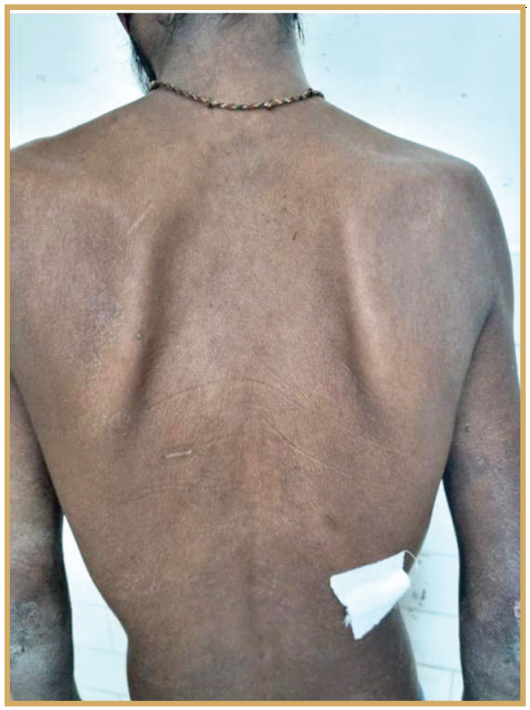

Fig. 1B : Multiple, ill defined, hypopigmented patches over back.

Fig. 2: Multiple fissures and hyper keratosis of bilateral soles.

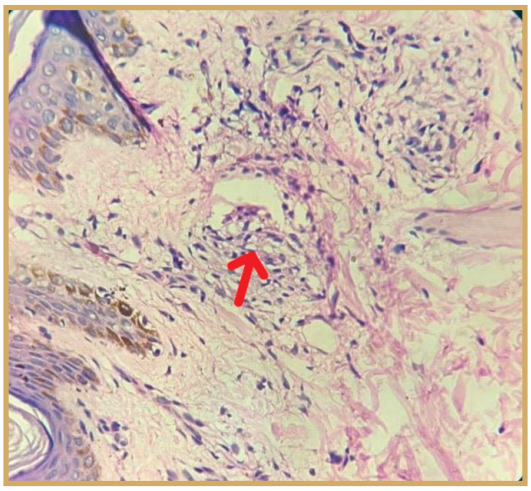

Fig. 3A: H & E staining with high power (40X) magnification showing foamy cells collection surrounding adnexal structures in dermis.

the past two months. Clinical examination of his extended family members including his parents and siblings revealed no features suggestive of

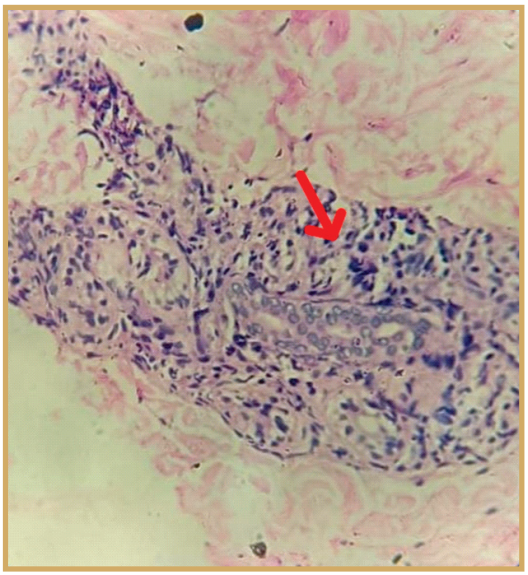

Fig. 3B: H & E staining with high power (40X) magnification showing foamy cells collection surrounding blood vessel in dermis.

leprosy or tuberculosis. There was no history of contact with known case of tuberculosis in family. Patient takes mixed diet and is seronegative for HIV.

On physical examination of the case being reported, multiple, ill defined, hypopigmented patches of size ranging from 2 to 4 cm were seen over chest, back, bilateral upper and lower limbs (Figs. 1A and 1B). Partial hair loss was observed on lateral half of both eyebrows. Saddle nose deformity was also observed in the patient. Two well defined ulcers 1.5*2 cm in dimension, with raised margins and erythematous floor, without discharge or slough formation were present over right knee joint. There were multiple fissures and hyper keratosis of bilateral soles (Fig. 2). Bilateral ulnar and common peroneal nerve were firm in consistency and thickened without tenderness. Decreased sensation with glove and stocking distribution was noted in addition to impairment

of temperature sensation, touch and pain. Straightening of ulnar border with wasting of muscles of thenar and hypothenar eminence was noted. Grade 2 disability was observed in both hands and feet.

Slit skin smears taken from both eyebrows and earlobes showed BI 5+ at each site. Skin biopsy taken from hypopigmented patch over left lower back showed multiple areas of foamy cells collection surrounding adnexal structures and blood vessels in dermis which was suggestive of lepromatous leprosy with BI 5+ (Figs. 3A and 3B)

Chest X-ray PA view was done which revealed right sided pleural effusion. CBNAAT of sputum and pleural fluid came out to be negative. Sputum culture showed pus cells and few gram- positive cocci and many gram-negative bacilli.

Pleural fluid analysis showed presence of adenosine deaminase (ADA) (59.8 U/L) and increased amount of proteins, suggestive of exudative Koch's effusion (Exudative Pleural Effusion). Patient was discharged from hospital on anti -tuberculosis treatment of 6 months and MB-MDT blister pack of 1 month and advised to take daily and monthly dose of dapsone and clofazimine only along with multivitamins and pyridoxine after which patient was lost to follow up

Discussion

We report a rare case of lepromatous leprosy with extra pulmonary tuberculosis. The interaction between leprosy and TB and its repercussions on the incidence of each other is matter of debate. Several case reports and cohort studies from the 1950s to the mid-1980s documented frequent co-infection of TB and leprosy in endemic areas, but this association has been rarely reported in recent years after the advent and widespread use of MDT. The impaired cell-mediated immune response in lepromatous leprosy may facilitate the progression of *M. tuberculosis,* a more virulent pathogen (Trindade et al 2013). This is in contrast with other early investigations which suggested that those individuals with acquired immunity against leprosy would be less susceptible to pulmonary TB than the general population because of cross-immunity (Trindade et al 2013). It has also been suggested that TB is more severe in co-infected patients (Nigam et al 1979); however, this was not the case in our patient. In TB endemic countries like India, patients with clinical signs and symptoms and raised ADA levels could be suggestive of extra-pulmonary tuberculosis where AFB positivity may be low (Gupta et al 2010). Clinicians should be aware of such situations.

Conclusion

Clinical manifestation of leprosy and extrapulmonary tuberculosis in same patient is rare. Vigilant approach is crucial, especially in endemic countries like India, to identify the diverse manifestations of leprosy and of tuberculosis infection. Leprosy (including lepra reactions) should be actively ruled out in all suspected cases with the help of microbiological, molecular biological and histopathological examination. Raising awareness is essential to ensure timely diagnosis and treatment, thereby reducing morbidity, minimizing the risk of drug resistance, and improving prognosis in treatable cases.

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