

## Coinfection of Mycobacterial diseases

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### Abstract

Although both mycobacterial infections are endemic in developing countries, the coinfection has hardly been reported in the last decade. The combined National TB & Leprosy Control Programme of Bangladesh came into effect in 1994. Though the Elimination of Leprosy (<1 case / 10,000 population) was achieved nationally in 1998, Bangladesh is still endemic for Tuberculosis. A 10 years cohort study was conducted in six districts of the Northern part of Bangladesh, covered by the Damien Foundation. This cohort consisted of a total of 4,788 leprosy cases registered from 2007 to 2016. Reviewing the records of all these cases, 25 (0.52%) patients were identified as having coinfection with Tuberculosis & Leprosy. All cases were coinfecting with smear positive pulmonary TB. This study concludes that dual infection with mycobacteria is uncommon. Early diagnosis is very important for better outcomes of both diseases.

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**Key words:** Coinfection, Leprosy, Tuberculosis.

### Introduction

Presently Leprosy is particularly prevalent in clusters in developing countries. The incidence of Tuberculosis has been increasing because of the HIV pandemics.<sup>1,9</sup> There is still more than 2 lac new cases of leprosy and more than 7 million new cases of tuberculosis registered annually Worldwide.<sup>6,7</sup> Both leprosy & tuberculosis are known to have similar geographic endemicity. Concomitant occurrence of Leprosy & Pulmonary TB is reported infrequently in the modern era.<sup>4,5</sup> An inherent impaired immunity against both mycobacterial organisms has been postulated as the aetiology for dual infection; however, it appears that the energy in leprosy is pathogen-specific.<sup>3</sup> Both diseases are chronic granulomatous infections caused by intracellular gram positive aerobic, acid-fast bacilli. There are multiple presentations of both diseases depending on the host's cell mediated immune response. It has also been suggested that TB is more severe in the coinfecting patient.<sup>1,8</sup> The simultaneous infection of both mycobacteria was initially reported by Pinto *et al* in 1991.<sup>2</sup> This retrospective study was carried out to find out the frequency of coinfection by Mycobacteria (Mycobacterium Tuberculosis & Mycobacterium Leprae).

### Methods

A 10 years Cohort Study was conducted in 6 districts of the Northern part of Bangladesh (former Greater Mymensingh Districts) covered by the Damien Foundation. This cohort consisted in a total of 4,788 leprosy cases registered from 2007 to 2016. This study was based on examination and analysis of treatment records (Treatment cards and Registers) of all cases.

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## Results

Among 4,788 leprosy affected persons, 2,477 were Multibacillary (MB) and 2,311 were Paucibacillary (PB). Reviewing the records of all these cases 25 patients were identified as having coinfection of Leprosy and Tuberculosis.

Details of these coinfecting cases are shown below with the Tables:

Table-I: Age distribution (n = 25).

Age in Years	Number of Patients	Percentage
0-24	0	0%
25 - 34	5	20%
35 - 44	4	16%
45 - 54	5	20%
55 - 64	5	20%
65 & above	6	24%
Total	25	100%

Table-II: Sex distribution (n = 25).

Sex	Number of Patients	Percentage
Male	23	92%
Female	2	08%
Total	25	100%

Table-III: Clinical Classification (n = 25).

Class	Number of Patients	Percentage
Tuberculoid	3	12 %
Borderline tuberculoid	16	64 %
Borderline Lepromatous	2	8 %
Lepromatous	3	12%
Pure Neural	1	4 %
Total	25	100%

Table-IV: Operational Classification (n = 25).

Types	Number of Patients	Percentage
Paucibacillary	9	36%
Multibacillary	16	64%
Total	25	100%

Table-V: Skin smear results (n = 16).

SSS result	Number of MB Patients	Percentage
Positive	7	44%
Negative	9	56%
Total	16	100%

## Discussion

Leprosy is not a very common disease in most parts of the World. The interaction between Leprosy & TB and its repercussions on the incidence of each other still remains a matter of debate.<sup>10</sup> TB may occur in Leprosy patients with predisposing pre-existing conditions such as Malnutrition, Diabetes or other immunosuppressed states and also in patients being treated with Corticosteroids for the complications of Leprosy.<sup>11</sup> In this study 25 (0.52%) cases developed both diseases. The average period between the occurrence of leprosy and tuberculosis (or the reverse) was 2.5 months. Among the coinfecting cases 64% were Multi-bacillary (MB) leprosy. 44% of the Multibacillary cases were bacteriologically Positive. 92% of the Coinfecting cases were Males. In the present study all cases were coinfecting with smear positive pulmonary TB. The mean age of the patients was 50 years (range from 28 to 80 years). This study showed that most of the cases of TB were associated with Borderline Tuberculoid (BT) Leprosy (64%). All Patients were treated Simultaneously for both diseases and responded favorably.

## Conclusion

This study revealed that dual Mycobacterial infection of Tuberculosis & Leprosy is rare. Early diagnosis and simultaneous prompt treatment can cure both diseases and can limit morbidity and mortality of coinfecting cases. It is important to note that TB should be ruled out in patients with Leprosy to prevent the emergence of Rifampicin-resistant TB.

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