# Retrospective analysis of leprosy reactions in a 3 year period

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## Abstract

***Introduction:*** Leprosy reactions are an important cause of morbidity for the patients. There are 3 types; type I, type II and mixed reaction.

***Method:*** This is a retrospective analysis of 65 patients during the period of 3 years from January 2007 to January 2010.

***Results:*** There were a total of 223 new patients under treatment for leprosy during the study period. 29% ( 65 ) developed lepra reactions. Type I reactions were seen in 67.6% type II in 21.5% and mixed in 10.7%. All the mixed cases and 61.5% of the type II patients had recurrences. Majority (88.6%) of type I patients responded to prednisolone alone. 51% of mixed and 71% of type II needed treatment with multiple drugs.

***Conclusions:*** Reactions were common in Multi Bacillary (MB) leprosy than in Pauci Bacillary (PB) leprosy. Three types of lepra reactions were identified; Type l, Type II and mixed reactions. Type I reaction was the commonest entity. Recurrences in Type I was uncommon.


## Introduction

Leprosy is a minimally contagious chronic granulomatous disease affecting skin and peripheral nerves. Leprosy patients have tendency to develop two types of reactions characterized by a response on the part of the immune system which damage the patients' tissues. Type I reaction occurs throughout the spectrum of leprosy except at its polar extremes and in early treatment period. Type II reactions erythema nodosum leprosum (ENL) are restricted to Multi Bacillary (MB) leprosy and occur late. Some developed both type I and type II at the same time (mixed type of reactions).

Our aim was to retrospectively analyse leprosy reactions in patients to assess the severity, immediate and long term outcome, response to therapy and any sequele.

## Methods

The records of all the new patients and subsequent visit patients attending the dermatology unit Teaching Hospital, Anuradhapura during the three years period from January 2007 to January 2010 were analysed to find those who had developed leprosy reactions.

The age, sex, type of leprosy, the duration of treatment prior to the development of reactions, the duration of reactions, recurrences and the final outcome of the treatment of leprosy and any disability and clinical features were noted. The leprosy patients were treated with multidrug therapy (MDT); rifampicin, clofazimine and dapsone.

The type of leprosy was determined using clinical features, slit skin smear and/or histology. The types of leprosy reactions were identified clinically and/or with histology.

## Results

A total of 223 new leprosy patients presented to the Dermatology Clinic, Teaching Hospital, Anuradhapura during the study period out of which, 29% (n=65) developed leprosy reactions. Among those there were 64.6% (n=42) men and 35.4% (n=23) women with a ratio of 1.82:1. The age ranged from 12-86 years. The mean age at development of leprosy reaction was 33 years. When age at onset of leprosy was considered majority (30.7%) belonged to 21-30 year age group. The age distribution of patients with leprosy reactions is shown in Figure 1.

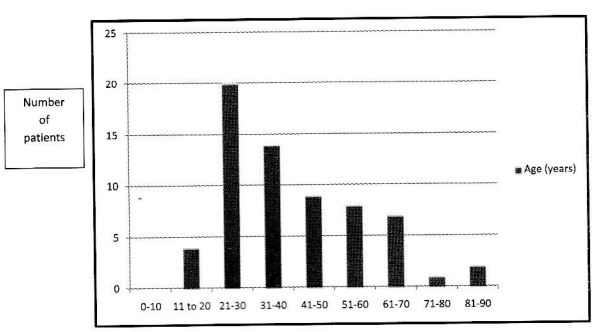


**Figure 1**. *The age distribution of patients.*

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The type I reaction was seen in 67.6% (n=44) patients while type II reaction was seen in 21.5% (n=14) patients. Mixed lepra reactions was seen in 10.7% (n=7) patients. Among PB leprosy patients, type I leprosy reaction only was seen. The distribution of reaction by the type of leprosy is shown in the Table 1.

Out of 65 reactions studied 20.76% (n=18) occurred before commencing MDT and 20.92% (n=19) occurred after stopping MDT. In type I reactions 33.8% occurred during the first 6 month of MDT. More than half of (54.5%) type I patients presented while on MDT.

In type II reactions 64.2% of patients presented after stopping treatment. In mixed reactions 57% of patients presented before starting MDT. The time period in which reaction occurs relative to the commencement of multidrug therapy is shown in Table 2.

## Treatment of reactions

Majority (88.6%; n=39) of type I patients responded to prednisolone alone. Out of the 5 patients who did not respond to prednisolone two were treated with clofazimine and azathioprine. One was treated with clofazimine and methotrexate and other two who had recurrences were treated with pentoxyfylline. 8 patients (57%) of type II reactions needed combination therapy; prednisolone, clofazimine, pentoxyfylline, azathioprine and/or thalidomide for more than 6 months. Out of these eight patients two had more than 4 recurrences and had to be controlled with thalidomide for three months. Four (57%) patients of mixed reactions had to be treated with combinations of drugs.

**Editors note:** According to guidelines, prednisolone is the 1st line of treatment for type I reaction. Azathioprine and cyclosporine are the 2nd line agents of proven benefit.

**Table 1. The distribution of reaction by the type of leprosy**

| *Type of Leprosy* | *Number of leprosy Patients with reaction* | *No of accredit to the* | | |
|---|---|---|---|---|
| | | *Type I* | *Type II* | *Mixed* |
| MB | 57 | 36 | 14 | 7 |
| PB | 8 | 8 | | |

**Table 2. The time period in which reaction occurs relative to the commencement of multidrug therapy**

| *Period* | *Number of patients* | | |
|---|---|---|---|
| | *Type I* | *Type II* | *Mixed* |
| Before treatment | 11 | 3 | 4 |
| Within one month of treatment | 5 | 1 | - |
| 1 - 6 months of treatment | 16 | - | - |
| 6 - 12 months of treatment | 3 | 1 | 2 |
| After completion of treatment | 9 | 9 | 1 |

### Recurrences

All the mixed reaction patients (100%) and 57% (n=8) of type II reaction patients developed recurrence of reactions. Out of 44 patients with type I reaction, 5 (11.4%) had recurrences.

### Sequelae

Nineteen (19) out of 65 patients (29.2%) developed sequel as 11 out of 44 patients (25%) with type I reactions had ulnar claw and one had both foot drop and ulnar claw.

Five (5) out of 14 (35.7%) patients with type II had ulnar claw and two patients presented with foot drop too.

Two (2) out of 7 mixed reactions had sequel, one with ulnar claw and other with ulnar claw and foot drop.

Two patients with type I reaction presented with facial nerve palsy and it improved with treatment for reaction and had to continue treatment for more than 6 months.

One lepromatous leprosy patient with type I reaction developed nodular lesions all over the body while on tenth month of treatment and histology confirmed it as histioid leprosy.

Two type I reaction patients developed pulmonary tuberculosis and lupus vulgaris while on prednisolone. The commonest clinical presentation was swollen erythematous tender existing lesions in type I and tender erythematous plaques and nodules with fever and arthralgia in type II.

## Discussion

Total of 65 patients were included in the analysis. There was a male predominance in line with previous studies[1, 4, 5]. Mean age at lepra reaction was 33 years and the majority (30.7%) belonged to the 21-30 year age category. According to the literature onset of the disease in the second decade of life is a risk factor for the development of ENL[3].

This study showed that leprosy reactions were commoner in the productive age group, thus leading to considerable loss of working and earning capacity.

Reactions were common in multibacillary leprosy in our study group. In most of the other studies[1,4,5] reactions were commoner among Pauci Bacillary leprosy than MB leprosy. The recent trend in Sri Lanka has been towards the detection of more MB cases.

In our study there are three types of reactions identified; type I, type II and mixed reaction. Mixed reaction is not an entity recognized by the WHO. Ragunathan *et al*[1] (2005, Sri Lanka) too reported similar data.

The majority (56.7%) of type I reactions presented while on MDT which agreed with previous studies. In our study 64.2% of type II reactions presented after completion of MDT. A study done in Chandigarh, India[6] showed that the majority of type II occurred 2-3 years after completion of MDT which agreed with our data. In our study group 57% of mixed reaction patients presented before starting MDT which agreed with a study done in NHSL Colombo[2].

In type I category 88.6% developed only one episode of reaction during study period and 11.4% developed recurrences. Recurrence of type I reactions was seen in 9.7% in a study done in India[6] where figures are closely similar to our study.

The majority (57%) of type II patients had several episodes of recurrences. Sixty four percent (64%) patients in the Chandigarh study[6] had recurrence in type II and it was slightly higher compared to our findings.

Most of the type I patients recovered without deformities but majority of type II patients developed deformities. Two patients with type II reactions were on combination of drugs for more than one year to prevent recurrences. Both these patients were finally treated with thalidomide and recovered completely and after that no recurrences occurred.

In type I reactions 44 patients out of 65 patients (67.6%) improved with prednisolone alone. 19 (29.2%) patients needed treatment with second line therapy.

Two (2) patients with type II reactions were managed conservatively with paracetamol.

All were given clofazimine (100-300 mg), while azathioprine at a dose of 50 mg 150 mg daily was used in 3 patients and azathioprine and pentoxyfylline was used in one patient.

Two (2) patients were treated with methotrixate with above drugs, while 5 patients were treated with pentoxyfylline 1200 mg daily. Current literature on the treatment of reaction recommends the use of clofazimine, azathioprine, pentoxyfylline and methotrexate[7,8] in addition to thalidomide which is considered to be the gold standard.

Thalidomide was used in severe reactions in a limited number (n=2) of patients with many precautions.

Deformities were seen in 29.2% of patients due to the disease. The incidence of deformities in this study was closely similar to the studies done in India, Thailand and Brazil (23-28%)[9,10,11].

## Conclusions

Reactions are more common in MB leprosy. Male predominance is seen. There are three types of leprosy reactions identified; type I, type II and mixed reaction. Type I reaction was the commonest entity. Recurrences in both type I and type II were closely similar to those described in available literature.

## Recommendations

As late reactions and recurrences were seen in a considerable number of patients (20.9%) continued surveillance of leprosy patients is advisable. Nerve impairment leads to disabilities and these can occur even after MDT is completed. Therefore continued surveillance after completion of MDT will help to reduce permanent disabilities.

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