



## Comparative Study on Impact of the Immunomodulators Drugs Levamisole and Albendazole on Multibacillary Leprosy in Two Different Medical Colleges in Different States and Regions

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### ABSTRACT

Leprosy is one of the oldest diseases have a afflicted man. The pathogenesis, pathology & immunology of leprosy have advanced enormously to its presenting standing. It has been proved immuno - modulation had profound effect on the therapeutic schedule of this disease. Use of immunomodulators such as Levamisole and Albendazole have shorten the duration of treatment with multi drug therapy, prevent the spread of the disease and reduce the financial burden of the patient. These immunododulators are cheap and easily available.

Thus the man aims of ours study was to :

1. Reduce the duration of treatment
2. Cost of treatment
3. Increase the efficacy of treatment with regard to reactions and relapse.

Comparative study was done between two different medical colleges in different states such as initially at MGM Medical College, Kishanganj, Bihar and later at K.P.C. Medical College, Kolkata, West Bengal.

### KEYWORDS

#### Introduction :

Leprosy is a spectrum disorder and it has well established WHO recommended Multi Drug Therapy (MDT) schedule, followed worldwide. Leprosy is a non-fatal chronic infectious disease caused by *Mycobacterium leprae*, where host immunity, environment and socio economic status of the patient, geographical area and to some extent genes and cellmediated immunity and humoral immunity play very important role. *M. leprae* was first observed microscopically by Hansen in 1897. In the tissue from a leprosy patient and subsequently studies have confirmed that it is the organisms responsible for human leprosy. MDT aims to destroyed *M. leprae*, but without altering the immune status of the patient directly. This lacuna can be targeted by the clinician to hasten the time cure. The disability and related social stigma associated with leprosy. Nasal excretion is the main portal exit in leprosy, while the role of desquamating skin is less certain.

The incubation period for leprosy is difficult to define. Onset is insidious, detection often delayed and immunological tools inadequate to determine onset of disease. Average incubation period is 3-5 years. Leprosy is commonly divided into tuberculoid, borderline and lepromatous types. The Ridley-Jobling histopathological classification incorporates two further intermediate types; Borderline tuberculoid and borderline lepromatous. Clinicopathological manifestations of leprosy are determined by host immunological response to *M. leprae*. Depending on whether immunological response follows predominantly a type 1 helper T lymphocyte (Th1) or type 2 helper T lymphocyte (Th2) pattern, the clinical picture evolves towards the tuberculoid or lepromatous ends respectively of the spectrum of clinical leprosy.

A recent study of 5439 patients in South India suggest that this cut off of five lesions is the best option for sensitivity

(88.6%) and specificity (86.7%) for detection of multibacillary cases compared with gold standard of slit skin smear.

#### Three cardinal signs of leprosy;

1. Hypopigmented/erythematous skin lesions showing definite reduction in sensation or
2. Enlarged and clinically impaired nerves at sites characteristic of leprosy or
3. Acid fast bacilli in slit skin smear.

Hence the use of Levamisole and Albendazole which are established immunodulators are recommended. This study was performed to get expected improvement in treatment of leprosy by adding above drugs along with conventional antileprosy medicines to individual patient. To find out whether it affects the treatment schedule positively, we performed histopathological comparisons between the two groups. It is to be noted that MDT for leprosy was introduced in phased manner in parts of India from the year 1982 onwards and 1995-1996 covered whole of India by it.

#### Material and Methods :

During this study multibacillary patient were selected for a clinical trail – three groups of patient were taken for consideration.

1. Administration of MDT only - control group.
2. Administration of MDT + levamisole - 150 mg. twice a week.
3. Administration of MDT + albendazole - 400 mg. once weekly in one month for three months.

**Study Location :**

1. Department of Microbiology Mata Gujri Memorial Medical College and LSK Hospital, Kishanganj, Bihar. Patient was referred from Dermatology OPD as well as from a wide catchment area including parts of Bihar and adjacent parts of West Bengal.

2. Department of Microbiology of KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal. Patient was referred from medicine OPD as well as from surrounding parts of Kolkata.

**Study Sample :**

Subjects were chosen by random selection method.

**Study of Methodology :**

Each patient was thoroughly examine clinically and by slit skin smear examination by modified ZN stain and categorized according to WHO criteria under multibacillary leprosy.

**Inclusion criteria :**

1. Both male and female included.
2. Only adult patient > 18 years included.
3. Newly diagnosed patient of lepromatous leprosy.

All patients having multibacillary leprosy were diagnosed as per WHO criteria.

1. Greater than 5 skin lesions.
2. Having nerve trunks involvement.
3. Positive slit skin smear.
4. Baseline histopathological picture - skin biopsy before starting treatment.

**Sample Size :**

1. A group of 100 patients were chosen from MGM Medical College and LSK Hospital, Kishanganj, Bihar.
2. A group 30 patients were chosen from KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal.

**Study period** - 2011 for MGM Medical College and LSK Hospital, Kishanganj, Bihar.

2015 for KPC Medical College & Hospital, Jadavpur, Kolkata, West Bengal.

Every patient was then explained carefully that they would be a part of a clinical trial, if they consented. The test procedures were described in details and consent form was given to them, which they signed or gave thumb impression.

Total 100 patients were included in the study of MGM Medical College & LSK Hospital, Kishanganj, Bihar. Divided at random into three groups.

1. Control Group - 40 patients
2. Test group - 30 patients includes levamisole + MDT
3. Test group - 30 patients albendazole + MDT

The other study included 50 patients at KPC Medical College & Hospital, Kolkata, West Bengal.

i) Control group 20 patients and test group 10 patients each.

At each visit slit skin smear taken from six sites i.e 4 lesions and 2 ear lobes. The smear was stained by Modified Z.N. stain and Bacteriological Index was calculated.

B.I. = total grading / no. of smears examined.

B.I. was recorded at each visit with date and visit number.

No. of visits = first three months once a week = 12 visits.

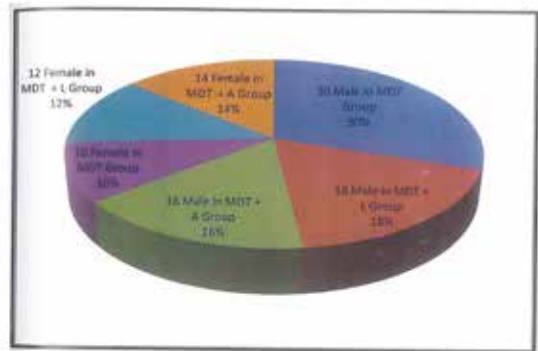
Second three months = once a fortnight = 6 visits.

Last six months once a month = 6 visits.

Total = 24 visits.

Study period is one year.

Figure - 1A



Pie diagram showing the distribution of male and female patients in the Control (MDT) and Test (MDT+L & MDT+A) Groups.

**Result and Analysis :**

In the Test group (MDT+Levamisole) there are 18 male patients which form 60% out of a total 30 patients and in the test group (MDT+Albendazole) there are 16 male patients which form 53.33% out of a total 30 patients.

In the Control group there are 30 male patients which form 75% out of a total 40 patients.

Therefore, total number of male patients participating in the study is 18+16+30=64. This forms 64% of the grand total of 100 patients.

In the test group (MDT+Levamisole) there are 12 female patients which form 40% out of a total 30 patients and in the test group (MDT+Albendazole) there are 14 female patients which form 46.67% out of a total 30 patients.

In the control group there are 10 male patients which form 25% out of a total 40 patients.

Therefore, total number of male patients participating in the study is 12+14+10=36. This forms 36% of the grand total of 100 patients.

This above analysis was done in MGM Medical College & LSK Hospital, Kishanganj, Bihar. Similar results and analysis was done at KPC Medical College & Hospital, Kolkata, West Bengal with 30 patients. There was not much difference between these two analysis which were compared.

**Discussion :**

Leprosy remains an important problem globally. In our study the data were collected and statistical analysis was done. According to analysis we find that B.I. values with test group of MDT and Levamisole shows better response than test group of the B.I. value with MDT and Albendazole. It is understood that the less co-efficient variation more effective is the treatment modality i.e the co-efficient variation for MDT + Levamisole is less than co-efficient variation for MDT + Albendazole. We have already stated that purpose of the study was to an-

analyse the response of systemic immunomodulator chemotherapeutic agents in multi bacillary leprosy patients. This is particularly common in areas like Kishanganj, Bihar where there is still high endemicity of leprosy than Kolkata, West Bengal.

### Conclusion :

India has shown great re-silience in overcoming great obstacles in the past and one can only hope that it will be successful in eradicating the ancient scourge of leprosy through the medical and social break through.

We need Genome based technology to address the unresolved issues of transmission of *M. leprae*. Major point for further investigation are :

1. Mechanism of Schwann cell injury in leprosy - TNF , cytotoxic T Cell and apoptosis.
2. Definition of tissue markers as indicative of nerve damage; such myelin components, ninjurin adhesions and ECM components.
3. Establishment of therapeutic interventions for nerve regeneration : matrix metalloproteinases inhibitors, inhibitors of apoptosis, adhesion inhibitors and methycobalmine.

It is important to identify any hidden infective source cases, trace and treat. A national sample survey was recently carried out to find out any inference in the known and actual cases (Katoch k, 2011, personal communication). Such surveys should be repeated. Integration of leprosy into the general health service has greatly enhanced the scope of leprosy service.

The most important step in eradication of any communicable disease is to knock out the last case-the possibility of which is yet to be achieved.

It is a good option to overcome this problem. The whole genome of *MW* has been mapped and sequenced and *Mycobacteria* sp. has been renamed as *M. indicum pranii*. Further studies can be planned to identify parts of the genome which impart the immunomodulatory properties to the organism.

Thus, we have tried to contribute by using Levamisole and Albendazole in my study for shorter duration in two different medical colleges and different states. Although, Leprosy elimination has been achieved (in most countries); eradication probably cannot be achieved by MDT alone, so adjunct use of Immunomodulators along with MDT is a good option for the future.



body Absorption (FLA - ABS) test for detecting sub-clinical.

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