Early Nerve Function Impairment in Leprosy, and its correlates in the Post Elimination Era

Symposium - Leprosy Control
19th September 2013
Leprosy is an infectious disease with a predilection for nerves, which it affects by invasion of Schwann-cells of peripheral nerve fibres. Nerve damage occurs due to accumulation of bacteria and hypersensitivity reactions of the immune system.

Early detection and corticosteroid treatment may prevent further decline in nerve function. This is of immense importance in preventing the physical, psychological and spiritual suffering caused by disabilities in leprosy.

The objective of this study was to examine the characteristics of the new leprosy patients reporting within the integrated systems in the post elimination era in some endemic states in India.
This is a descriptive cross sectional study.

Study Location: Leprosy Mission Referral Hospitals in Delhi, Purulia, Barabanki, Naini, Kothara, Chandkuri, and Muzaffarpur.

Sample: All new leprosy patients registered at these hospitals between March-2011 and April-2012 were screened for inclusion in the study.

Inclusion Criteria: All new leprosy patients between 6 years - 80 years, never treated before.

Eligible patients were informed about the study and requested to participate.
METHODOLOGY

- Examination: All included patients were examined the same day by a doctor and by a physiotherapist.
- Documentation: Demographic details, history, clinical examination including Voluntary Muscle testing and Sensory Testing (VMT/ST) were done and recorded for all the patients in pre-designed forms.
- A semi-structured interview regarding extent and causes for delay in reporting was also conducted for all the patients.
**METHODOLOGY**

**Sensory Assessment**

<table>
<thead>
<tr>
<th>Assessment Tools</th>
<th>Palm</th>
<th>Sole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective Sensation</td>
<td>2 gm</td>
<td>10 gm</td>
</tr>
</tbody>
</table>
Muscle strength was tested with the modified Medical Research Council (MRC) scale (0–5). Muscles innervated by the facial, ulnar, median, radial, and lateral popliteal nerves were assessed by asking the participant to perform five movements: eye closure, little finger abduction, thumb abduction, wrist extension, and ankle dorsiflexion. Motor NFI was defined as a score of less than four for any move.

All the data was entered into a computer database and analysed on SPSS.
A total of 374 patients were recruited for this study.

There were 141 females and 233 males.

The age of the patients ranged from 3 years to 80 years, with 66% between 15 and 44 years.

There were 35 male and 32 female children.
RESULTS

Occupation (%) n=374

- Manual Laborer/Farmer: 30%
- Skilled Labor: 22%
- Tradesman/Clerical/Professional: 25%
- Housewife: 9%
- Student: 6%
- Others: 8%

Results indicate a significant percentage of respondents are engaged in manual labor, followed by skilled labor and tradesman/ professional roles.
RESULTS

Reason for visiting Hospital (%) n=374

- Patch: 53%
- Anesthesia: 22%
- Reaction: 16%
- Deformity: 4%
- Ulcer: 5%
RESULTS

RJ Classification (n=374)

<table>
<thead>
<tr>
<th>RJ</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>43 (11.5%)</td>
</tr>
<tr>
<td>BT</td>
<td>234 (62.6%)</td>
</tr>
<tr>
<td>BB</td>
<td>59 (15.8%)</td>
</tr>
<tr>
<td>BL</td>
<td>11 (2.9%)</td>
</tr>
<tr>
<td>LL</td>
<td>23 (6.1%)</td>
</tr>
<tr>
<td>PN</td>
<td>4 (1.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>374 (100%)</td>
</tr>
</tbody>
</table>

**RESULTS**
RESULTS

Patches present in 302 Pts. (n=374)

- 1 patch: 61
- 2 to 3 patches: 73
- 4 to 5 patches: 93
- ≥5 patches: 65
RESULTS

Nerves Enlarged: in 247 Pts (n=374)

- 42% for 1 nerve
- 25% for 2 to 3 nerves
- 33% for ≥4 nerves
RESULTS

Nerve Enlarged in 247 Pts (%) (Both Rt & Lt Nerves n=748)

- Ulnar: 41.3%
- Median: 4.9%
- Radial: 1.6%
- Lat.Pop: 35.4%
- Post.Tibial: 13.9%
RESULTS

Bacterial Index (n=374)
- Positive: 84%
- Negative: 16%

Positive BI (n=61)
- 0.1 to 2: 5%
- 2.1 to 4: 5%
- >4: 6%
## RESULTS

### Muscles power grade for 374 Patients (Both Rt & Lt Nerves n=748)

<table>
<thead>
<tr>
<th>Muscle Power</th>
<th>Facial</th>
<th>Ulnar</th>
<th>Median</th>
<th>Radial</th>
<th>Lat.Pop</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>32</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>17</td>
<td>7</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>11</td>
<td>9</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>738</td>
<td>676</td>
<td>724</td>
<td>748</td>
<td>741</td>
</tr>
</tbody>
</table>
RESULTS

Sensory Impairment in 374 Pts (Both Rt & Lt Nerves n=748)

- **Ulnar**
  - Affected: 10%
  - Unaffected: 90%

- **Median**
  - Affected: 6%
  - Unaffected: 94%

- **Post.Tibial**
  - Affected: 11%
  - Unaffected: 89%
RESULTS

Delay in coming to hospital

- **<6 months**: 52%
- **6 months - 2 years**: 38%
- **2-5 years**: 7%
- **>5 years**: 3%

[Diagram showing delay in coming to hospital]
RESULTS

WHO Disability Grade (%) (n=374)

- Grade 0: 77%
- Grade I: 9%
- Grade II: 14%
RESULTS

Treatment at Enrolment (%) (n=374)

- MDT: 34%
- MDT & Steroids: 66%
More males than females reported.

66% were aged between 15 to 44 years and 18% are children below 15 years.

Patches are the most common 1st symptom of leprosy reported by patients.

Ignorance (58%) was the most common reason for delay.

23% patients had WHO grade I and II disability respectively at the time of reporting.

34% of cases had to be put on steroids at their first visit.
This study shows that

- The gender imbalance in new case detection for leprosy still persists with more males than the females reporting for medical care.

- Patients are still reporting late resulting in a large number of people developing disabilities and needing steroids at their first visit.
We gratefully acknowledge the support of The Leprosy Mission Trust India and all the patients who participated in the study.