Footwear for the person with an anesthetic foot: what options are available?

PANKAJ GUPTA*, KARTHIKEYAN** & RAJEEV JOY NATHAN**
*The Leprosy Mission Community Hospital, Delhi, India
**The Leprosy Mission Trust, India

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Introduction

Leprosy is predominantly a disease of peripheral nerves and it particularly affects the nerves supplying the eyes, hands and feet, leading to irreversible impairments, if not treated early. Impairments in the foot include sensory loss, motor weakness of the anterior and/or lateral compartment of the leg and intrinsic muscles of the foot and dryness in the sole of the foot due to the involvement of the common peroneal and posterior tibial nerves; these impairments act as predisposing factors for plantar ulceration. Because of sensory loss in the sole of the foot it is essential for those with leprosy to practice foot care and inspect their feet regularly for early signs of skin damage to prevent secondary impairments. Early measures such as resting the foot, pressure relief through the use of crutches and appropriate medical care will prevent secondary impairments such as plantar ulcers and consequent deformities.

Appropriate protective footwear made with a micro-cellular rubber (MCR) insole is recommended by the National Leprosy Eradication programme (NLEP) in India for people affected by leprosy with sensory loss in the soles of their feet. In most instances this footwear is either pre-fabricated or ordered in bulk, and is usually made by a shoe technician with minimal equipment, so the finishing and appearance is generally not comparable with commercially available footwear. In addition, the availability of MCR footwear is limited to the colour black with fixed designs and they are usually of the same design for both genders. Most of the time acceptability of this footwear is questionable because of improper fitting, lack of suitable designs for males and females and various other reasons. Those affected by leprosy with anesthetic feet are often reluctant to use MCR footwear, in spite of realizing that protective footwear is essential to prevent secondary damage to their feet.

This reluctance to use proper footwear is one of the main reasons for the progression of impairments in patients with anesthetic feet. It is recommended that those with anesthetic
feet should also be able to select the proper footwear for their feet and it should have
following qualities:7

1. It should fit the size of the foot.
2. It should be affordable and cost effective.
3. It should be easily available.
4. It should be aesthetically pleasing to the person who is using it.
5. The widest part of the shoe must fit the widest part of the foot.
6. The shape of the shoe must fit the shape of the foot.

Therefore, the aim of this short report is to explore the characteristics which patients seek in
MCR footwear for continuous and prolonged use.

Methods

This study was conducted at The Leprosy Mission Community Hospital, Nandnagri, New
Delhi, which is a referral hospital for leprosy and its complications. Study participants
include those affected by leprosy with anesthetic feet who visited the hospital during the
period January to December 2015. The opinions expressed by the patients who were not using
the footwear regularly were documented. These were those who were reluctant to use the
current models and designs of the footwear, or were not satisfied with the footwear model
because of any other reason, along with their suggestions to improve the acceptability of
footwear. Their opinions were further categorised according to predefined themes to come up
with acceptable footwear designs.

Results

A total of 372 patients were given MCR footwear during the period of January to December
2015. Among them 72 patients (59 males and 13 females) were not satisfied with the MCR
footwear provided to them and they were asked to give suggestions to improve the
acceptability of the footwear. The suggestions given by the patients are shown in Table1.

<table>
<thead>
<tr>
<th>Suggestion</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCR footwear should be available in various colours and designs</td>
<td>92%</td>
</tr>
<tr>
<td>adjusted velcro straps to accommodate different sizes and shapes of feet</td>
<td>79%</td>
</tr>
<tr>
<td>fitting of an MCR insole into commercially available footwear</td>
<td>65%</td>
</tr>
<tr>
<td>a well-fitting insole</td>
<td>29%</td>
</tr>
</tbody>
</table>

Overall, the top five suggestions expressed by patients are: MCR footwear should be
available in various colours and designs (92%), closed footwear design for the winter season
(79%), adjustable velcro straps to accommodate different sizes and shapes of feet (75%),
fitting of an MCR insole into commercially available footwear (65%) and a well-fitting insole
(29%), which can be inserted into any shoes or footwear. The choice of suggestions expressed
are different for males and females. Footwear without a back strap was the second highest
choice expressed by female patients while none of the male patients mentioned it.

Discussion

Appropriate footwear is one of the most important components of any prevention of disability
programme in leprosy. MCR is useful in facilitating the healing of ulcers as well as
preventing recurrence.8 MCR reduces the pressure over the plantar surface on the sole of the
Footwear for anaesthetic feet

Table 1. Frequency and percentage of suggestions given by users to improve the acceptability of footwear, ranked according to their choice

<table>
<thead>
<tr>
<th>s.no</th>
<th>Suggestions</th>
<th>Male (n = 59)</th>
<th>Female (n = 13)</th>
<th>Total (n = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>MCR should be available in more colours and designs</td>
<td>56 (95%)</td>
<td>10 (77%)</td>
<td>66 (92%)</td>
</tr>
<tr>
<td>2.</td>
<td>Closed footwear with MCR for winter should be available</td>
<td>57 (97%)</td>
<td>0</td>
<td>57 (79%)</td>
</tr>
<tr>
<td>3.</td>
<td>Length of the Velcro straps should be more than normal, so that the adjustment is easy</td>
<td>49 (68%)</td>
<td>5 (38%)</td>
<td>54 (75%)</td>
</tr>
<tr>
<td>4.</td>
<td>MCR insole should be fitted into the footwear which is available in the market</td>
<td>45 (76%)</td>
<td>2 (15%)</td>
<td>47 (65%)</td>
</tr>
<tr>
<td>5.</td>
<td>If possible, proper well fitted insole should be given to patients so that they can be used in any footwear/shoe.</td>
<td>11 (19%)</td>
<td>10 (77%)</td>
<td>21 (29%)</td>
</tr>
<tr>
<td>6.</td>
<td>Footwear should have the durability of more than one year</td>
<td>11 (19%)</td>
<td>6 (46%)</td>
<td>17 (24%)</td>
</tr>
<tr>
<td>7.</td>
<td>All modifications and customisation should be done with machines for proper and good finishing</td>
<td>8 (13%)</td>
<td>1 (7%)</td>
<td>9 (13%)</td>
</tr>
<tr>
<td>8.</td>
<td>The footwear insole should be customised according to the shape and size of the foot</td>
<td>7 (12%)</td>
<td>2 (15%)</td>
<td>9 (13%)</td>
</tr>
<tr>
<td>9.</td>
<td>Footwear should be without back straps</td>
<td>0</td>
<td>8 (62%)</td>
<td>8 (11%)</td>
</tr>
<tr>
<td>10.</td>
<td>The MCR footwear needs to be free of cost, but should be well-designed and well fitted</td>
<td>4 (7%)</td>
<td>1 (7%)</td>
<td>5 (7%)</td>
</tr>
</tbody>
</table>

Footwear for anaesthetic feet9 and has been the choice of protective footwear among health professionals for patients with anesthetic feet due to leprosy since the 1960s.10

Over the years, MCR footwear has been associated with stigma, resulting in poor compliance.11 Suggestions from patients were not considered in designing footwear to suit their choice; as a result, patients who are not satisfied with the shoes provided may not use them, which will lead to damage to their feet.12 In this study, an attempt was made to take suggestions from patients to understand their requirements and develop the footwear of their choice, and thus allow continuous use of the footwear during their daily activities. The suggestions given by the patients were thematically categorised to understand the areas required to improve continuous use.

The results show that one in five patients were not satisfied with the current designs of the footwear offered by the hospital. A majority of these patients expressed the need for footwear in more colours and designs to wear during various occasions instead of using same footwear for all the occasions. The females especially wanted different footwear for different occasions. One of the suggestions was to provide only the insole which can easily be inserted into any other shoes.

Many respondents were not satisfied with the fitting of the footwear, as there was a discrepancy in the size and shape between the foot due to swelling, ulcer dressings and absorption of digits.3 Individually customised footwear will improve the fitting and
continuous use of the footwear, particularly the provision of adjustable Velcro straps. The females were of the opinion that they do not want back straps on footwear. Also, they expressed their opinion that the footwear should not be bulky but should fit the shape of their feet. Patients also said that the modifications suggested should not compromise the quality of the footwear and some were willing to bear the additional cost incurred due to modifications. Overall there were many suggestions for improvement in the current design of footwear which must be addressed through well planned research to improve the acceptability and continuous use of the footwear.

Conclusion

It can be concluded from this short report that a good fit, design and colour are the major issues for better acceptability of the footwear. Further, some of the patients were actually willing to pay the additional cost to get good and acceptable footwear. It is also important to perceive the person affected by leprosy as the customer or end user of the services. This short report highlights the changing scenario in that it is very important to see the person affected by leprosy not as burden on the system, but rather as a client of the services that must address their reasonable expectations.

Limitation of the study

The patients included in this study are from the hospital and in an urban environment. A broader picture could be drawn through a representative sample from both urban and rural areas.

Recommendation of the study

The necessary modifications, with individualised customisation is the key to better acceptability of the footwear and prolonged use, which in turn will decrease the secondary impairment due to sensory loss in the sole of foot.

Acknowledgements

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