A public health approach for leprosy detection based on a very short term-training of primary health care workers in basic dermatology

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Summary

Introduction In countries where leprosy control is integrated to general health services, health workers, at primary health care level, often manage a large number of patients with skin diseases including leprosy. The distinction of leprosy from others skin diseases requires more skill and attention. Basic dermatological knowledge will help these staff to provide a better quality of care. A few years ago, a short term training programme focussed on leprosy and some common skin diseases was set up in Mali through a pilot project. This study will evaluate the impact of this training on the detection of leprosy at primary health care level.

Methods health care workers from two health districts were invited to participate in the training. Trainee was submitted to an anonymous written test before training, immediately after and 12–18 months post-training using a standardized scoring system. The suspected or referred leprosy cases before and after training were compared. Data were recorded and analysed with the software Epi info version 6.04.

Results Overall, 495 HCW attended the three anonymous written tests (before training, just after and 12–18 months later). The proportion of participants who gave correct answers before training, just after were respectively: 33 and 57% for correct diagnosis, 5 and 39% for test of sensation and 28 and 47% for referral. Eight patients suspected of leprosy were referred for further examination; in these, five cases of leprosy were detected.

Discussion The training showed a huge improvement in the skill of the participants in managing leprosy patients. This study addresses how leprosy control can be improved by involving primary health care staff and by the implementation of only a single day’s training on basic dermatology.

Conclusion The role of the dermatologist in this post-elimination era of leprosy needs to be reconsidered and adapted to the increasing need to take multiple programmes, inclusive of dermatology and leprosy, into primary health care services and those interested in leprosy control should fund these programmes.
Introduction

Recently, integration of leprosy control activities into general health services particularly at primary care level has been advocated to provide better coverage of the population. It has also been identified as the best option to sustain leprosy control.1,2 Today, in most countries endemic for leprosy, the disease control activities are now performed by primary health care workers (PHCw). These staff have generally received training of varied duration before starting this work. Most of the time, such training is focused on leprosy detection rather than on the differential diagnosis of skin lesions. In addition, their skills are rarely evaluated after training. In a previous study, it has been shown that the presence of hypochromic patches as an early indicator of leprosy is much less common than hypochromic lesions due to other form of skin disease.3 The main causes of hypochromic patch were pityriasis versicolor, followed by pityriasis alba, birth marks (naevus achromicus) and vitiligo. Thus, providing a minimal dermatological training to PHCw, including early detection of leprosy, will contribute to reinforce their competency and ability to manage leprosy particularly in developing countries where dermatological facilities are hardly available. In these countries designing a dermatological public health programme combining both leprosy and common skin disease will be more cost-effective.

In 2001, a dermatological pilot project to control common skin diseases was set up in Mali (West Africa). The teaching programme of this project was focused both on common skin diseases i.e. pyoderma, scabies, superficial mycoses, contact dermatitis as well as on leprosy recognition and referral of all suspected cases to a more specialized service for confirmation of the diagnosis. The aim of this study is to evaluate the impact of this programme on the leprosy detection by PHCw in the study area.

Materials and methods

STUDY AREA AND PARTICIPANTS

This dermatological pilot project, which has been financially supported by the International Foundation for Dermatology (IFD), was carried out in two health districts in Mali, an urban (Bamako, the capital, city) and a rural health district 95 km far from the capital.

At the beginning of the project, all the PHCw in the two areas were counted. A total of 612 HCw were distributed (18 in rural area, 594 in urban) in 75 centres (7 in rural area, 68 in urban). There were 108 doctors, 269 nurses and 235 midwives.

INTERVENTION

All the PHCw posted in the study area were invited to participate in the training programme, which consisted of a 1-day training session mainly focused on the detection of early leprosy and management of common skin diseases including pyoderma, scabies, tinea capitis and other superficial mycoses. The teaching method used a combination of clinical slide presentations together with the introduction of a simple algorithm developed by the team to provide a standardized care plan (diagnosis and treatment).4 Regarding leprosy, participants were trained to suspect it when noting a ‘pale patch’ by sensory testing and to eliminate other diseases presenting with similar signs such as pityriasis alba, pityriasis versicolor, birth marks (naevus anaemicus) and vitiligo. In addition, the teaching was often re-inforced with the
practical demonstration of patients from the dermatology clinic. All the participants received at the end of training session, a set of 'referral counterfoil tickets’ for referring suspected cases of leprosy and other skin Diseases, whose diagnosis and management they considered to be beyond their competence, to the dermatology clinic (Marchoux Institute).

**EVALUATION**

The participant’s knowledge was evaluated both theoretically and practically.

*Knowledge evaluation (theoretical)*

An anonymous written evaluation was carried out regularly before and just after the training session using a standardized scoring system. Each trainee was submitted to these tests. A short term evaluation was also carried out 12–18 months later. In order to do this, a representative number of health centres was randomly chosen and the health workers invited to a new written assessment. The evaluation consisted of typical slide shows and standard questions such as: what’s your diagnosis? How would you managing this condition? Data were recorded and analysed with the software Epi info version 6.04. The chi square test was used to compare the proportions.

*Evaluation of the practices*

The evaluation of the clinical performance of health agents was carried out before and over 1 year after the training sessions. This was based on counting the number of suspected cases of leprosy referred. A total of 20 health centres representative for the whole study area were selected to test the system. When referring a patient, the trained health workers filled the referral ticket, keeping one copy and giving the other to the patient to attend the dermatology clinic. Here, all referred patients were clinically examined by a dermatologist who checked the referral tickets. If needed, a skin biopsy was taken for histological confirmation. Every 6 months, one of the project investigators visited the health centres of the selected area for the purpose of tracing lost referred cases and giving feed back information on those who were seen in the Institute.

**Results**

**Knowledge Evaluation**

Overall, 495 PHCw attended the three anonymous written tests: 389 came to the pre-training and just after, and 106 the later assessment. The proportion of participants who either provided a correct diagnosis, or recommended testing sensation or who stated that they wished to refer patients had increased considerably after training (P-value < 0.001) (Table 1). These proportions, before and just after training were respectively: 33 and 57% for correct diagnosis, 5 and 39% for test of sensation and 28 and 47% for referral. In addition, the proportion of correct answers did not significantly change between the tests done just after and 18 months later: 57 and 74% for correct diagnosis, 39 and 34% for test of sensation and 47 and 53% for referral. There was no difference in the results when participants were analysed by their professional training, i.e. doctors, nurses or midwives. Assuming that the
correct procedure was to make a correct diagnosis and test sensation and refer the patients, the proportion of participants who gave correct answers had significantly increased between the first two tests (respectively 117/389 and 203/389, \( P \)-value, 0.001). When compared, the proportion of those performing correctly in the last two tests (just after and 12–18 months) showed a trend to increase but the difference was not significant (respectively, 203/389 and 66/106, \( P \)-value = 0.06).

PRACTICAL EVALUATION

In the study area, before the study, the registers of health workers showed only a single case of referral. However, over the 18 months after training, 18 patients including 14 with ‘pale patches’ were referred for further examination on the referral ticket basis (Table 2). Among these, only eight patients were seen in which five cases of leprosy were detected: one was indeterminate, two were borderline tuberculoid and two were multibacillary variants with grade 2 disabilities according to the World Health Organization (WHO) classification. Five

### Table 1. Comparison of knowledge of HCW for the diagnosis of leprosy

<table>
<thead>
<tr>
<th>Participant’s knowledge</th>
<th>( n )</th>
<th>Correct diagnosis ( n (%) )</th>
<th>Test of sensation ( n (%) )</th>
<th>Referral ( n (%) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before training</td>
<td>389</td>
<td>130 (33)</td>
<td>18 (5)</td>
<td>110 (28)</td>
</tr>
<tr>
<td>Just after</td>
<td>389</td>
<td>221 (57)*</td>
<td>152 (39)*</td>
<td>184 (47)*</td>
</tr>
<tr>
<td>12–18 months later</td>
<td>106</td>
<td>79 (74)b</td>
<td>36 (34)d</td>
<td>56 (53)f</td>
</tr>
</tbody>
</table>

Before compared to just after training: a, c, e: \( P \)-value < 0.001. Just after compared to 18 months later: b, d, f: NS.

### Table 2. Characteristics of suspected leprosy patients referred

<table>
<thead>
<tr>
<th>Patient</th>
<th>Referral duration* (months)</th>
<th>Gender</th>
<th>Age</th>
<th>Diagnosis by PHCw as written in ticket</th>
<th>Correct diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>4</td>
<td>F</td>
<td>38</td>
<td>Pale patch (leprosy)</td>
<td>MB leprosy (disabilities 2)</td>
</tr>
<tr>
<td>R2</td>
<td>6</td>
<td>M</td>
<td>47</td>
<td>Pale patch</td>
<td>MB leprosy (disabilities 2)</td>
</tr>
<tr>
<td>R3</td>
<td>2</td>
<td>F</td>
<td>55</td>
<td>Pale patch (leprosy)</td>
<td>NR</td>
</tr>
<tr>
<td>R4</td>
<td>3</td>
<td>F</td>
<td>25</td>
<td>Pale patch, pain</td>
<td>NR</td>
</tr>
<tr>
<td>R5</td>
<td>2</td>
<td>F</td>
<td>30</td>
<td>Pale patch</td>
<td>Mucinosis</td>
</tr>
<tr>
<td>R6</td>
<td>7</td>
<td>M</td>
<td>47</td>
<td>Pale patch</td>
<td>Discoid lupus erythematosus</td>
</tr>
<tr>
<td>R7</td>
<td>10</td>
<td>M</td>
<td>23</td>
<td>Pale patch</td>
<td>Pityriasis alba</td>
</tr>
<tr>
<td>U1</td>
<td>4</td>
<td>M</td>
<td>5</td>
<td>Pale patch, (leprosy suspected)</td>
<td>NR</td>
</tr>
<tr>
<td>U2</td>
<td>4</td>
<td>M</td>
<td>38</td>
<td>Pale patch, (leprosy suspected)</td>
<td>PB leprosy (BT) (disability 0)</td>
</tr>
<tr>
<td>U3</td>
<td>4</td>
<td>M</td>
<td>42</td>
<td>Pale patch</td>
<td>Vitiligo</td>
</tr>
<tr>
<td>U4</td>
<td>6</td>
<td>F</td>
<td>60</td>
<td>Pale patch</td>
<td>NR</td>
</tr>
<tr>
<td>U5</td>
<td>9</td>
<td>F</td>
<td>10</td>
<td>Pale patch</td>
<td>NR</td>
</tr>
<tr>
<td>U6</td>
<td>6</td>
<td>F</td>
<td>13</td>
<td>Pale patch</td>
<td>Leprosy I</td>
</tr>
<tr>
<td>U7</td>
<td>6</td>
<td>F</td>
<td>15</td>
<td>Leprosy suspected</td>
<td>Leprosy PB (BT) (disability 0)</td>
</tr>
</tbody>
</table>

R: patient from rural area, U: patient from urban area.
* Time between the end of training and the date of referral.
F: female; M: male.
NR: none retrieved, PHCw: primary health care workers.
patients referred did not go to the Institute. No more cases have been referred since 18 months from the end of training.

Discussion

This study was a pilot project aimed to evaluate the impact of a short training programme on basic dermatological skill on the leprosy case detection at primary health care level in a developing country. The results showed that there was a huge and stable improvement in the skill of PHCw in managing patients suspected of having leprosy. Subsequently, many patients including some cases of leprosy were referred for confirmation to a specialized service. The aim of this pilot project was not to train PHCw to diagnose leprosy, but just to develop an increased awareness of the possibility of the diagnosis of leprosy when faced with a patient with a pale patch. In the study by Norman et al., the same method of awareness creation in combination with screening has been reported in high school students in India. The diagnosis of early cases of leprosy usually requires skill and attention. Usually, in our cases, except two patients with disabilities, the diagnosis of the others who presented hypochromic or pale patches might require some skill in dermatology. The success of this project may be explained by the fact that our teaching materials and methods were very simple and the diagnostic skills were based on a standardized algorithmic method that had been fully evaluated. The proportion of leprosy cases detected on referral system (5/8) is consistent with the sensitivity expected from the algorithm used in the study (75%). This performance is particularly adapted to primary health care facilities where referral activities run passably well and if accurate diagnosis is done at a high level. Further evaluation of the algorithm showed that this sensitivity could be improved when the duration of the disease is taking in account. The training has also increased the number of cases referred, as before the training sessions, only a single case of referral had been seen. However, this effect showed a decline after approximately 18 months indicating training needs to be reinforced periodically to produce long lasting improvement in competences. In addition, effort needs to be undertaken to make the service more attractive and sensitive to community needs.

This study also illustrated how leprosy control can be improved by involving all health staff and by the implementation of only a single day’s training focussed at primary health care level. In some endemic areas where leprosy activities are said to be integrated, less than 33% of HCW are able to recognize early leprosy. Even, they suspected leprosy, a test of sensation is rarely performed. Finally, the reliability of the diagnosis of leprosy made by such these health workers should be questioned. The structure of our leprosy detection plan, as organized in this study, is a good model for organizing leprosy control and training: it is designed to operate at primary health care level where the largest number of people are seen and managed, and not at secondary or tertiary care level which is best utilized for specific diagnostic and treatment advice and more complex cases that can be seen by those with appropriate expertise.

In the past years, the success of vertically integrated but costly programmes led to leprosy being considered as a condition that should be managed in isolation. To date, as illustrated in our study, leprosy should be regarded as a real part of dermatology. It remains a prominent part of the curriculum in all dermatology programmes, sadly given little credit by national leprosy elimination programmes. In China, 75% of new cases were voluntarily reported and detected through dermatological clinics. Moreover, one can see how this country, with the
largest population, has managed and is still managing leprosy through a programme that is essentially dermatological. However, while dermatologists have become less public health minded in China, leprosy nevertheless remains an entry point into dermatological public health programmes which governments need to encourage by expecting integration and collaboration with its Community Disease Control Programmes. The role of the dermatologist in this post-elimination era of leprosy needs to be reconsidered and adapted to the increasing need to take multiple but low cost low technology programmes, inclusive of dermatology and leprosy, into general health services, but avoiding overload of this poorly funded system. These projects may well be sponsored by donors interested in leprosy as well as the pharmaceutical industry and the scientific community for whom low technology is unappealing. Given that our programme is both flexible and country adaptable, and as the expertise is available the world over, there is a little excuse for delay.

References