Leprosy case detection using schoolchildren

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Summary  An innovative method that combined awareness creation with screening of high school students by their peers was undertaken in 26 randomly selected schools in the project area of the Schieffelin Leprosy Research and Training Center, Karigiri, Vellore, India. This method entailed educating teachers and student leaders in grades 8–12 about leprosy and how to suspect leprosy among their peers. The student leaders in turn conducted a similar awareness programme for their peers and encouraged them to report if they suffered from any skin problem or skin lesion. Based on the reporting by their peers, the class leaders prepared a ‘suspect list’. Within a fortnight of the awareness program, a trained leprosy worker visited the school and examined all the students on the ‘suspect list’. Those diagnosed to have leprosy were referred to a medical officer, who then confirmed the diagnosis and initiated treatment. Among the 23,125 students enrolled in the 26 randomly selected schools, 234 student leaders were educated about leprosy and trained to detect suspect lesions among their peers. A total of 2200 (9.5%) children reported with skin lesions to their leaders and after screening by a leprosy supervisor and confirmation by a medical officer, 14 new cases (NCDR 6.05/10,000) were detected. This rate was found to be comparable with case detection rates of annual school surveys done during the National Leprosy Eradication Programme (NLEP), when all schoolchildren were examined. The paper suggests that schoolchildren can be used effectively in leprosy case detection and this method has the additional advantage of creating awareness among them, their teachers and communities.

Introduction

Children are susceptible to leprosy as they are to any other disease. Among children, the disease usually manifests as a single hypopigmented patch with normal or impaired sensation. Hypopigmented patches on the face are common, but not all hypopigmented patches are due to leprosy. Unless specifically screened for, a skin lesion due to leprosy in
children may go undetected and may manifest itself in early adulthood with disabilities. The disease in children is eminently responsive to treatment if detected in the early stages.\(^1\)

Leprosy among children has epidemiological significance and can be considered as an index of the prevalence of the disease in the population.\(^2\) Although higher case detection rates may be due to the case detection activities undertaken, a high child rate may indicate continuing spread of the disease in the community. A case detected among children also provides an opportunity to detect the index case, usually within the family.

Children under 15 years constitute approximately 30% of the population. Prevalence rates of leprosy in schoolchildren reported from different parts of India vary from 0.03% to 11%.\(^3\)\(^4\)

Annual school surveys were one of the case detection activities of the NLEP. Almost 20% of all new cases detected were among school-going children. In areas where school enrollment and attendance was high, this methodology enabled easy accessibility and high coverage of this vulnerable population. Cases among children were detected in the early stages and disabilities were relatively a small proportion.

Though this methodology proved effective, it needed a lot of manpower and was time consuming. Creating awareness about the signs and symptoms of the disease and the consequences was not emphasized. In some situations, the children and their parents were not informed of the diagnosis even during or after chemotherapy.

The Schieffelin Leprosy Research and Training Center, at the request of theGovt. of Tamil Nadu, implemented the NLEP in the erstwhile Gudiyatham Taluk of Vellore. Annual school surveys were done on a regular basis. This active case detection method required the leprosy control team to visit every school in the project area once a year. All children were enumerated and examined by trained male and female leprosy workers. Cases detected were referred to a medical officer for confirmation of diagnosis, investigations, registration and initiation of treatment. Those children who could not attend the clinic were given domiciliary treatment. Compliance to treatment was high.

In 1997, the Government of Tamil Nadu integrated the vertical NLEP with the general health services. Separate school surveys for detection of leprosy were discontinued after integration and case detection is expected to be through voluntary reporting. Unfortunately, unless the awareness levels are high in the community, people may report long after the initial symptoms are noticed, usually after the development of disabilities. In view of the importance of detecting leprosy early among children this innovative methodology that combines awareness creation with case detection was initiated.

### Material and methods

This method of case detection in schools emphasizes on educating schoolchildren about leprosy, its early signs and symptoms and training them to identify a suspect of leprosy.

In the academic year 2001, all high schools in the project area were listed. Of the 45 high schools, 26 were randomly selected to include both rural and urban schools. Meetings were conducted with the headmaster/headmistress to obtain permission and to enlist their cooperation. The school staff was requested to choose 5–15 student leaders from among the 8th to 12th classes who would participate in the programme. Both boys and girls between 13 and 18 years of age were chosen.

A Health Educator conducted one health education session for the teachers and the student leaders. The session lasted between 30 and 45 min and included teaching and
discussions on the facts about leprosy using clinical photographs and pictures of early signs of the disease. The children were then taught to examine the skin for hypopigmented skin lesions and identify ‘suspect lesions’ of leprosy. Students were encouraged to discuss and clarify doubts. The procedure to be followed subsequently was explained in detail to the student leaders. The student leaders along with their class teachers conducted a similar education session subsequently for their peers.

During the next 2 weeks, those children who were trained, conducted similar awareness programmes for their peers on the signs and symptoms of leprosy. Students with any skin problem or skin lesions were asked to report to their peers who then prepared a list of suspects. This list was submitted to the headmaster/head mistress, who endorsed it and passed it on to the leprosy supervisor, who visited the schools 2 weeks after the health education programme. The trained leprosy supervisor then examined all suspects to confirm the diagnosis.

Those children suspected or confirmed to have leprosy were visited at home and their parents were requested to bring the child to the base hospital for detailed clinical examination by the medical officer and registration of the case if confirmed as leprosy.

Results

In 2001, 26 randomly chosen schools were selected among the 45 high schools in the project area that included both rural and urban schools. In the selected schools, a total of 23,125 children were enrolled. Two hundred and thirty-four class leaders were identified and were given health education and training on leprosy. A total of 2200 (9.5%) children reported to the student leaders as having some skin problem or skin lesion(s) and were included in the suspect list. The leprosy worker screened the suspects and 14 new cases of leprosy were diagnosed and registered for treatment (NCDR of 6-05/10,000). The majority of cases were in the age group 10–14 years and the male:female ratio was 1:8:1. Seventy percent of cases presented as single lesions. In 2002, the same methodology was used in fewer schools with an enrolled population of 13,251. Of these, 904 children were reported as suspects by the leaders and subsequently screened. Eight cases were detected (NCDR of 6-04/10,000).

Table 1. Annual school surveys done during NLEP

<table>
<thead>
<tr>
<th>Year</th>
<th>Children on roll</th>
<th>Proportion examined</th>
<th>Cases detected</th>
<th>NCDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>39,515</td>
<td>90.9</td>
<td>22</td>
<td>6.1</td>
</tr>
<tr>
<td>1992</td>
<td>41,569</td>
<td>91.9</td>
<td>31</td>
<td>8.1</td>
</tr>
<tr>
<td>1993</td>
<td>43,325</td>
<td>90.5</td>
<td>26</td>
<td>6.6</td>
</tr>
<tr>
<td>1994</td>
<td>38,083</td>
<td>92.0</td>
<td>21</td>
<td>5.9</td>
</tr>
<tr>
<td>1995</td>
<td>46,772</td>
<td>89.0</td>
<td>31</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Methodology using schoolchildren

<table>
<thead>
<tr>
<th>Year</th>
<th>Children on roll</th>
<th>Proportion of suspects</th>
<th>Cases detected</th>
<th>NCDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>23,125</td>
<td>9.5</td>
<td>14</td>
<td>6.05</td>
</tr>
<tr>
<td>2002</td>
<td>13,251</td>
<td>6.8</td>
<td>8</td>
<td>6.04</td>
</tr>
</tbody>
</table>


Table 1 compares the new case detection rates between the school surveys done by NLEP and the new method. Only a smaller number of children had to be screened to detect approximately the same proportion of leprosy cases.

Discussion

The frequency of occurrence of leprosy among children is an important epidemiological index for determining the level of transmission of the disease.5 The importance of screening pre-school and younger children systematically to detect the disease early has been emphasized.6 School screening is an effective and efficient method of case detection for leprosy, especially in hyper-endemic areas. After integration of the leprosy elimination programme with the general health services in Tamil Nadu, active case detection using school surveys was discontinued. Though annual health check-ups take place in schools, there is the possibility that early leprosy cases may be missed during this check-up and there may be a consequent delay in detection of leprosy among schoolchildren. In this context, it is important to develop innovative methods that could be used in the field with minimal resources.

During the vertical NLEP, approximately 90% of all children were thoroughly examined and cases detected. In our methodology, only 7–10% of the schoolchildren needed to be screened but it produced almost a comparable yield. The NCDR obtained by this method is comparable to those achieved through active school surveys carried out during the NLEP. Most studies have reported prevalence rates rather than new case detection rates. The prevalence rates have varied from 1.2/1000 to 13.5/1000.3,7,8 In a study where health education was included as a part of the survey, the prevalence rose from 7.6/1000 to 9.8/1000, the prevalence being higher after health education was given.7 It is interesting to note that despite an effective MDT program in operation in this area since 1982, the NCDR among schoolchildren has remained almost the same over the past 10 years. This indicates that transmission continues to occur in the community. Familial contacts are known to have a significant role in the development of childhood leprosy.6 However, this was unfortunately not done in our programme.

Most studies have reported a male: female ratio that favours the males.6,9,10 In this study too, we found a preponderance of males among the cases. However, it is important to remember that skin patches may be missed especially among high school girls, due to the inability to examine unexposed parts of their body due to lack of privacy at school.

This methodology of creating awareness followed by voluntary reporting of skin problems to their peers might overcome this problem. Priming the children through health education, a personal approach by the survey team and the provision of privacy has been found to improve the case finding yield.7 Seventy percent of the cases detected had single skin lesions, which is similar to that reported in other studies,8,10–12 though some studies show a very low rate of single skin lesions.13 Early diagnosis and prompt treatment is critical to the success of the leprosy elimination strategy. Enhancing community awareness about leprosy is vital to the early reporting of cases. It is imperative that all categories of society, such as teachers, schoolchildren, village leaders and communities, get involved in the early reporting of ‘suspect lesions’.

Since school-going children account for roughly one-third of the population and will
become the future generations of society, creating awareness among them would have a long lasting beneficial effect. They are an easily accessible target group for education or intervention programmes. Enhancing awareness among children could also have a ‘ripple effect’ among their families and the communities they come from and in the long run could improve early voluntary reporting.

Though leprosy is still a stigmatized disease in India, the involvement of teachers, parents and other schoolchildren in the detection process, seemed to lessen the problem of stigma. This is evidenced by the fact that all the children with suspect lesions presented themselves for screening by the leprosy worker and those detected completed the recommended treatment. Creating awareness on the facts of leprosy among the children, could over time, help in the reduction of stigma in the community.

One of the challenges faced was the non-availability of time to complete all schools in the area. With the ever-increasing importance given to education, most schools conduct weekly tests and examinations for the high school students to prepare them for the board examinations. Even sparing an hour or two was seen as impinging on the critical time available for studies. This problem was overcome by choosing months when the children had just returned from holidays and careful planning and co-operation of the headmaster/head mistress of the schools.

This innovative methodology was found to be less time consuming and needed less manpower. It could be adopted in countries where leprosy is endemic and resources limited. This methodology could be incorporated into the routine annual school health check-up where such a program exists. In the light of the final push towards elimination of leprosy as a public health problem, and a possible reduction in the allocation of resources, this method may be more sustainable in the long term.

Acknowledgements

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References