Rapid survey on case detection of leprosy in a low endemic situation, Zhucheng County, Shandong Province, The People’s Republic of China

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Summary  The prevalence of leprosy fell below 1 per 100,000 in Shandong province in 1994. Since then, a few incident leprosy cases have been reported each year over the past 10 years. In order to explore whether or not the reduction in case detection in the province was due to the stopping of active case-finding activities, a rapid village survey was conducted in a formerly endemic county, using skin disease service. Ninety-one villages in 23 townships, covering a total population of 104,885, were surveyed. No leprosy case was detected. The results of the survey, along with other evidences, such as higher MB/PB ratio among newly detected cases and late onset of the disease, suggest that leprosy is dying out as a disease in the county as well as in Shandong. The efforts of the leprosy control programme should shift to other services such as prevention of disability and care for the disabled.

Introduction

Shandong province is located in the northeastern part of China, with a population of 90 million. Leprosy had been endemic in Shandong, but the prevalence fell below 1 per 100,000 in 1994. Since then, active case-finding activities have been stopped, except for contact examination according to the national guideline of leprosy control. In the past 10 years, roughly 50 new cases were detected on average each year. Their distribution in the community has been uneven. Some were detected in a few 'clusters' but others were unexpectedly reported to the leprosy control programmes in some formerly high endemic areas in Shandong.

The question should be asked whether these few new leprosy cases reflect the real epidemiological situation or if they are due to operational factors such as the cessation of active case-finding activities? It was decided to organize a rapid survey to see if there remain
some hidden leprosy cases undetected in the community. One of the formerly most endemic counties in the province was selected for this purpose.

Materials and methods

Zhucheng County of Weifang Prefecture is located in the eastern part of the province, with a population of 1.05 million. It has the highest cumulative number of leprosy cases (2249 since 1955), and had the second highest prevalence rate of leprosy in the province. During the period 1992–2004, a total 28 new leprosy cases were detected in the county (Table 1). Twenty-seven were diagnosed at skin clinics and one case was detected by contact examination. The WHO grade 2 disability rate was more than 20%, with an average time of 2.6 years between onset of symptoms and diagnosis, meaning that some new cases probably were delayed in diagnosis.

Taking into consideration the cluster nature of leprosy, the experiences gained from previous surveys conducted in the province and the available budget, the survey was targeted on the villages where either any new leprosy cases had been detected since 1992 or a cumulative number of at least 6 leprosy cases were detected. In total, 91 villages in 23 townships were selected, covering a population of 104,885, corresponding to around 10% of the total population of the county.

In order to maximally provide ‘clues’, paramedical workers at the township level and rural doctors of the villages involved in the survey were invited to participate in a workshop where the clinical manifestations of leprosy were presented by local leprosy control staff. In the preparatory phase of the survey, the county bureau of health issued a document to ask the leaders of the villages for collaboration. A pictorial poster with skin lesions of leprosy was distributed to the health station of each village. The survey team, headed by a leader of the county skin control station (formerly called leprosy control station), consisted of two skin

Table 1. New leprosy cases detected in Zhucheng County 1992–2004

<table>
<thead>
<tr>
<th>Year</th>
<th>MB*</th>
<th>PB**</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1993</td>
<td>4</td>
<td>0</td>
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<tr>
<td>1994</td>
<td>1</td>
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<td>1995</td>
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<td>0</td>
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<td>1996</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1997</td>
<td>5</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>1998</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1999</td>
<td>3</td>
<td>0</td>
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</tr>
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<td>2</td>
</tr>
<tr>
<td>2001</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<td>2002</td>
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<td>0</td>
</tr>
<tr>
<td>2003</td>
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<td>5</td>
</tr>
<tr>
<td>2004</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>26 (93%)</td>
<td>2 (7%)</td>
<td>28</td>
</tr>
</tbody>
</table>

* Multibacillary leprosy.
** Paucibacillary leprosy.
doctors from the county skin control station, one paramedical doctor from the township hospital and one village leader.

One or 2 days before the survey, the news that the county skin doctors would come for skin disease check-up was broadcast in the village. When the survey team arrived, all villagers who had any skin problems were invited for diagnosis and treatment. The consultation was free, but the medications had to be paid. Usually the team stayed in the village for half a day or 1 day, depending on the size of the population. At the same time, a skin doctor visited leprosy families in the village for contact examination and checking cured leprosy cases for relapse. In each village, the team leader organized a group discussion with community leaders, teachers, the leader of the women’s group and the rural doctor(s), to encourage them to report any suspects of leprosy.

All the suspected leprosy cases reported to the survey team were recorded and examined by county senior leprosy doctors for the confirmation of the diagnosis. Skin smear and biopsy would be taken when necessary.

Results

A total of 1360 people with skin problems presented themselves to the survey team. Nine of them were suspected of having leprosy by the doctors of the survey team. Following the discussions with community key informants, an additional eight suspected ‘clues’ were reported to the survey team, mainly by rural doctors. These 17 suspects were examined by the county senior leprosy doctors. None were found to have leprosy. Of the 196 ex-leprosy patients alive in 91 villages, 171 were checked. No relapses were seen. One hundred and 83 contacts were examined. No leprosy case was found.

Discussion

Compared with a total population survey, a rapid survey or rapid village survey (RVS) is a quick, simple and inexpensive method in leprosy case finding, which is and continues to be used in many leprosy control programmes around the world. The main purpose of the RVS is to assess the extent of the leprosy situation in a certain area (district, state and even a country). During the RVS, only a small proportion of sampled villages, rather than the whole population, will be examined. This method can also be applied as a case-finding tool in relatively low-endemic conditions.

RVS is also known as ‘clue survey’ in China. During the survey any person with signs of leprosy such as lagophthalmos, claw hands, collapsed nose, foot ulcer of unknown origin, anesthetic skin lesions or enlarged peripheral nerves is asked to report to the survey team voluntarily or will be referred by key informants such as village leaders, rural doctors and school teachers. This method has played an important role in the case finding of leprosy in Shandong as well as in China. Between 1955 and 1994, around 80% of the leprosy cases in Shandong were detected by RVS.

In the current survey, no leprosy cases were found. The explanation could be multiple. Firstly, some leprosy cases may not have been detected due to inadequate information on leprosy during the survey. One study conducted in Kanpur Urban Project, India found that additional health education messages on leprosy during the survey along with other means
could improve the proportion of examined population. It is difficult to validate whether or not additional information during the survey could result in the detection of more leprosy cases in a very low endemic situation.

Secondly, some leprosy patients may not have presented themselves for examination. This may have been due to the fear of social stigma, which is common in many societies. In the current survey, an effort was made to avoid this by using skin disease services rather than leprosy services. It is also possible that the patients were absent from the village (gone to work or to the market) at the time of the survey, because the survey team only stayed half a day or one day in each village.

Thirdly, some people with early skin lesions did not show up, either because they thought that their problem did not require medical attention, or because of financial problems. Some insight in these three possible explanations could be gained if, during the following years, any new cases would be found in the villages covered by the survey and their time of onset of the disease and the reasons why they did not visit the survey team could be identified.

Lastly, it is possible that the result of the survey reflects the real situation of leprosy in the county. This would imply that leprosy truly is on the decline and that the chain of transmission of leprosy has been interrupted. The rare incident cases still occurring reflect past infection. In Norway, it has been shown that most leprosy cases detected in the late phase of the leprosy control programme tend to be in the older age groups and the majority are MB cases. In the survey county, 26 (93%) of the 28 newly detected cases during the period 1992-2004 were MB cases, and most patients (71%) were in the more than 40 years age group (Figure 1). A similar tendency of aging and a high MB/PB ratio among new cases were also found in the province as a whole. In addition, the time span between primary and secondary cases was much longer among the contacts in the province than among those in areas where leprosy is still endemic.

While there are no simple, scientifically valid methods to get an insight into the existence, or not, of hidden cases, it seems reasonable to extrapolate this experience to other parts of

![Figure 1](image_url). Age group distribution among 28 newly diagnosed leprosy patients.
the province. A similar survey was conducted in 2005 in Gaoyou County, Jiangsu Province. In this county, leprosy had also been endemic but prevalence had dropped below 1 per 100,000 in 1998. Here as well, no leprosy cases were found during the survey. These findings suggest that leprosy is a dying-out disease in Shandong and other provinces, such as Jiangsu, where prevalence has been brought below 1 per 100,000. If this is the case, it will have some implications for the organization of leprosy control activities in the province. The training of paramedical workers will have to be adapted, health promotion to increase public awareness of leprosy will have to be promoted and the use of key informants in the community will have to be intensified. The impact of these changes might be limited, however, because the number of hidden leprosy cases in a formerly endemic county is likely to be small.

In such a changing epidemiological situation, the efforts of the leprosy control programme in the province should shift to other leprosy services such as prevention of disability and care for the disabled.

References