Active case detection of leprosy among indigenous people in Sarawak, East Malaysia

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Summary  Leprosy is still an important public health problem in many developing countries. In Malaysia, the elimination status was achieved in 1994 and in Sarawak it was achieved in 1996. However, leprosy is still highly prevalent among the indigenous Penans in Sarawak with an annual prevalence rate of 5.5 per 10,000 population compared to 0.07 per 10,000 population for the rest of the population in Sarawak from the year 2000 to 2013. This study showed that targeted active case detection was an effective method to detect new leprosy cases in a highly endemic area among the indigenous Penans.

Keywords: Leprosy, Active Case Detection, Indigenous, Penans

Introduction

Leprosy is an ancient disease that is still an important public health problem in many developing countries. An estimated two million people are disabled by the consequences of leprosy worldwide. In 1991, the World Health Assembly adopted a resolution to ‘eliminate leprosy as a public health problem by the year 2000’ and defined elimination as attaining a level of prevalence below one case per 10,000 population. Malaysia achieved leprosy elimination at the country level in 1994, while Sarawak achieved it in 1996. However, the data from the Sarawak State Leprosy Control Programme showed that a relatively high prevalence of leprosy still occurs among the Penans who are a small group of indigenous tribes in Sarawak.

Sarawak is a Malaysian state on the island of Borneo. It has a population of around 2.4 million, consisting of Sarawak natives (Iban, 28.9%; Bidayuh, 8.0%; other Sarawak natives, 6.3%), Chinese (23.3%), Malays (23.0%), Melanau (5.0%), and others (0.7%).

The Penan community is a part of the Dayak group in Sarawak, Brunei and Kalimantan. The Sarawak Penans are grouped under ‘other Sarawak natives’ in the census. Their
population in 2010 was estimated to be 16,281 people and about 77% live in permanent settlements. The remaining 20% are semi-nomadic while 3% still live as nomads. The Penan community inhabits the highlands of tropical forests which are less accessible and most of their dwellings are located between river basins.

The records from the Sarawak Health Department showed that even though the Penans made up less than 1% of the total population, they contributed 35.5% (113 out of 318) of the notified new leprosy cases in Sarawak during the 14-year period from 2000 to 2013. This gives them an annual prevalence rate of 5.5 per 10,000 population compared to 0.07 per 10,000 for the rest of the population during the 14-year period.

True elimination of leprosy should encompass all population groups, especially those who are vulnerable and marginalised. Special efforts should be taken to ensure that leprosy elimination targets are met for them as well.

In this study, we will share results of active case detection activities that were carried out by one of us, in one of the Penan settlements in Baram District in Miri Division in Sarawak (see Figure 1 for map).

**Methods**

This is a cross sectional study. We went through the records of the Village Health Team based at Miri Divisional Health Office, to determine the number and location of Penan settlements in Miri Division.
We also went through the records of notified leprosy cases among the Penan community in the Miri Division in the past 5 years to identify the Penan settlements that had the highest number of notified cases. The top three settlements were Long Bruang (five cases), Long Lamei (four cases) and Long Sait (three cases). Those three settlements were selected for the Active Case Detection (ACD) activities, and were visited by the ACD Team in February, May and September 2013.

The ACD team had to go to the settlements using a combination of logging roads, and longboats. Members of the ACD team comprised a doctor, assistant medical officers and a laboratory technician who had been trained to screen and take slit skin smears and skin biopsies for the laboratory confirmation of leprosy.

Upon arrival at the settlements, the ACD team introduced themselves and explained the purpose of the visit. The ACD team is familiar to the Penans in all the settlements as staff from the Divisional and District Health Offices have been there regularly to provide other health services.

All those who were present in the settlement during the time of the visit were screened by the medical officer or assistant medical officers using available daylight. We looked for any abnormal skin changes especially on the trunk, both upper and lower limbs and the face, and nerve thickening. We performed slit skin smears or skin biopsy on the area with abnormal skin changes after taking verbal consent. The smears were fixed in alcohol while the skin biopsy was fixed in formalin.

The slit skin smears were brought back by the ACD team and read by the laboratory technician at the State Leprosy Control Programme. The skin biopsies were sent to Sarawak General Hospital laboratory for reading and reporting by a pathologist. The reports from the laboratory were sent to Leprosy Control Unit in Miri.

The diagnosis of leprosy is made in any person who has any one of three cardinal signs: (1) one or more hypopigmented, anaesthetic skin patches, typical of leprosy; (2) one or more thickened peripheral nerves; or (3) a positive slit skin smear or skin biopsy.7

All cases diagnosed were notified to the assistant medical officer working in the clinics nearest to the settlements to contact the case and initiate multidrug therapy (MDT).

Results

We screened 83 Penans in Long Sait and detected six new leprosy cases $n = 6/83$ (7.2%) (Table 1).

Of the six new cases detected, one was multibacillary $n = 1/6$ (17%) and five were paucibacillary $n = 5/6$ (83%). Skin biopsy results showed two confirmed tuberculoid leprosy and three early tuberculoid leprosy. None of them had any deformity (Table 2).

Discussion

In this study, we found that a high number of leprosy cases has been detected through targeted active case detection in endemic localities. According to Doull et al. and van Beers et al., mass surveys to detect actively all new patients are not cost-effective and are, therefore, not routinely used by leprosy control programmes. Many programmes have restricted active case
finding to household contacts of newly detected leprosy patients, since this group has an increased risk of disease, as was shown in the early 1940s.\textsuperscript{11,12}

The elimination of leprosy among the Penans still remains a challenge. This is shown by the high annual prevalence rate among the Penans at 5·5 per 10,000 population for the past 14 years compared to the other ethnic groups in Sarawak. As the Penan tribe are sparsely distributed in the deep jungle of Borneo, it is a challenge to detect leprosy cases among them. Current healthcare access for the Penans is through the nearest health clinic from their village and the use of flying doctor services.

Our hypothesis to explain why the Penans are susceptible to leprosy is that of their endemic localities, close contacts and crowded households. According to Novel Lyndon \textit{et al.} the average number of persons per Penan household is 6·2\textsuperscript{2·1} persons.\textsuperscript{6} \textit{Mycobacterium leprae} has a long incubation period ranging from 5 to 15 years.\textsuperscript{8} Patients with lepromatous leprosy shed mycobacteria in their nasal secretions thereby continuing infection. \textit{Mycobacterium leprae} is an organism and can survive for up to 5 months outside of the human body.\textsuperscript{9} In India molecular techniques have shown that in endemic areas up to 5\% of the population are carrying \textit{Mycobacterium leprae} DNA in their noses.\textsuperscript{10} Future studies should look into the possible etiology of the carrier stage of this disease among the Penans.

\textbf{Table 1.} Demographic data of subjects examined during active case detection in Long Sait, Baram, Sarawak

<table>
<thead>
<tr>
<th>Age Group (Years)</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Case</td>
<td>Normal</td>
</tr>
<tr>
<td>0–9</td>
<td>16</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>10–19</td>
<td>14</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>20–29</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>30–39</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>40–49</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50–59</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>60–69</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>2</td>
<td>36</td>
</tr>
</tbody>
</table>

\textbf{Table 2.} Types of leprosy diagnosed in Long Sait, Baram, Sarawak

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Sex (M = male F = female)</th>
<th>Type of Leprosy</th>
<th>Slit Skin Smear</th>
<th>Skin Biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>M</td>
<td>Multibacillary</td>
<td>Positive</td>
<td>Not done</td>
</tr>
<tr>
<td>28</td>
<td>M</td>
<td>Paucibacillary</td>
<td>Negative</td>
<td>Early tuberculoid</td>
</tr>
<tr>
<td>28</td>
<td>F</td>
<td>Paucibacillary</td>
<td>Negative</td>
<td>Early tuberculoid</td>
</tr>
<tr>
<td>45</td>
<td>F</td>
<td>Paucibacillary</td>
<td>Negative</td>
<td>Tuberculoid</td>
</tr>
<tr>
<td>50</td>
<td>F</td>
<td>Paucibacillary</td>
<td>Negative</td>
<td>Early Tuberculoid</td>
</tr>
<tr>
<td>71</td>
<td>F</td>
<td>Paucibacillary</td>
<td>Negative</td>
<td>Tuberculoid</td>
</tr>
</tbody>
</table>
Conclusion

In Summary, Leprosy is still endemic and highly prevalent among the Penans in Sarawak. Targeted active case detection is recommended in areas with high number of leprosy cases.

Acknowledgements

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References

5 State Planning Unit, 2010.