



Using leprosy elimination campaign on leprosy case finding: Case series study in Kurdistan, Iran

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Original Article

Abstract

BACKGROUND: Because of the long incubation period of leprosy and disability caused by it, even mother to fetus transmission has been reported. Thus, this disease causes much alarm. Kurdistan Province, which is located in the Western part of Iran, is one of the regions that have previously suffered from endemic leprosy. The aim of the present study was to investigate the effects of the leprosy elimination campaign (LEC) on leprosy case finding in Baneh, Iran, in 2012.

METHODS: This case series study was conducted in Baneh District. Case finding was performed via LEC method, which is a recommended method for leprosy case finding in endemic areas. The performed steps included public education, and screening families of ex-patients through careful examination, identification of suspected cases, and diagnosis based on specialist's examination.

RESULTS: The families of ex-patients were assessed and 76 people who had prolonged exposure to ex-patients were invited to be examined by a trained general physician. Subsequently, 50 people were referred to a dermatologist for further examinations, 5 of whom and 1 unexposed person underwent bacteriological test for further evaluation. The results of all the tests were negative.

CONCLUSION: Active leprosy case finding and use of LEC method require a great deal of money and efforts to identify a small number of patients. Because a district like Baneh is in the process of eliminating leprosy and since the economic and social situation has changed greatly over the past two decades, LEC method is no longer cost effective.

KEYWORDS: Leprosy, Case Series, Iran

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Introduction

Leprosy is a chronic disease with a long incubation period of about 5 years. The disease symptoms can appear about 20 years post-exposure. The disease pattern shows the global registered prevalence of leprosy to be at

180,618 at the end of 2013. Moreover, during the same year, 215,656 new cases were reported.¹ In 1985, 122 countries worldwide had a leprosy incidence of greater than 1 in 10,000 in 2000. This incidence increased to 24 in 10,000 in 2001, and 15 in 10,000 in 2002, but reduced to 12 countries. Currently, the highest numbers of leprosy patients are reported in India, Brazil, Madagascar, Nepal, and Mozambique Tanzania".² In the 44th Assembly

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of the World Health Organization (WHO), the elimination of leprosy by the year 2000 was proposed,³ elimination meaning a prevalence of less than 1 in 10,000. However, due to the long incubation period of between 6 to 20 years, it does not seem logical. As can be seen in the case of South Africa which had achieved the elimination of leprosy in 1924, but recently new cases have been detected in Northern Transvaal.⁴

Appropriate planning for case detection and periodic examination should be regarded necessary to prevent disability.⁵ The leprosy elimination campaign (LEC) is one of the strategies recommended for areas where leprosy is endemic and where there are weaknesses in detecting new cases of leprosy,⁶ and thus, there is a need for its elimination. According to the WHO, "Iran is among the countries that have achieved leprosy elimination, and has less than one case per 10000".⁷ Although Iran has achieved national, provincial, and district elimination of leprosy in 1992, 1996, and 1997, respectively, the disease is still reported in some endemic parts of the country. According to the Ministry of Health and Medical Education's report in 2011, Kermanshah, Kurdistan, and Azerbaijan, Iran, have the highest prevalence rates in the country.⁸ Moreover, the prevalence of leprosy in Iran is now only 0.12 cases per 10,000 in the general population.⁹

Thus, leprosy is endemic in Iran.^{10,11} Kurdistan province, with a population of 1598440 in 2011, is one of the Western provinces of Iran. Leprosy has always been an endemic disease in Kurdistan. Since the identification of the first cases in 1932 until the end of 2012, 693 cases were registered in Kurdistan. Baneh, Iran, with a population of 139003, is a district in Kurdistan Province. Since the beginning of the registration of leprosy cases until the present moment, 78 cases have been reported in Baneh. It has had the highest prevalence rate in the province.¹²

Considering the abovementioned facts, the importance of finding new cases, and achieving elimination, a case finding intervention program was conducted in 2012 to find hidden cases of leprosy in Baneh. Hence, in this study we tried to not only detect new leprosy cases via LEC method, but also assess the effects of LEC method on the effectiveness of leprosy case detection in Baneh as an endemic area in 2012.

Materials and Methods

This case series study, as a health system research (HSR), was conducted during a period of 3 months from September to November 2012 in Baneh.

The study population included all residents of Baneh. In this study, case finding was performed via LEC method, which is a well-known method. LEC method was introduced for leprosy case detection in endemic areas by the WHO in 1995.

Case finding and multi-drug treatment of patients are the main objectives of LEC. The main components of LEC are capacity building for health workers to improve multiple drug resistance (MDR) services, promoting participation in leprosy-related activities at a peripheral level in the community, and diagnosis and treatment of patients, particularly those who influence the community.¹³ In order to assess the impact of public education on LEC, the case finding program was conducted in India and it was found that 50% of people have enough information. Specificity and sensitivity of LEC were 85.7 and 79.2%, respectively.¹⁴

Executive Team: The research executive team consisted of all doctors and specialists working in health centers and active in public education, a specialized team that consisted of general physicians, and 2 public health undergraduates of leprosy therapeutic centers.

Cost: Elimination of leprosy services have been carried out for 3 months and integrated

with primary health care (PHC) services. Since this area is endemic, many people should be checked and individuals with a history of leprosy or history of leprosy in their close contacts are in the high risk group. The results showed that this method is not a cost-effective method of identifying new cases.

To conduct LEC, two different methods of public education and direct examination of families of ex-patients were used. This study consisted of the following stages:

1. Forming the research and training teams: In this study, research planning and training of teams were performed in Baneh district. As the first step, a workshop was held for staff working in urban and rural health care centers.

2. Public training: In the next stage, public training programs were implemented in the district for 2 weeks. The training programs included training classes at rural health centers and health houses, installation of billboards and banners, and distribution of educational tracts in the city and rural areas.

3. Reception and examination of suspected individuals: At this stage, the examination of suspected cases was coordinated.

4. Visiting the families of ex-patients: The team consisting of 1 general physician and 2 public health undergraduates of leprosy therapeutic centers located in Baneh were trained to detect clinical manifestations (signs and symptoms) and complications of leprosy. First, a list was prepared of names and addresses of all leprosy patients in the district. Then, ex-patients' families were visited and assessed by the research team. All individuals suspected of having leprosy were referred to a dermatology center for further assessment.

5. Examination of suspected cases by a dermatologist: In the next step, leprosy and tuberculosis (TB) coordinator physician referred the suspected cases to a dermatologist for further examinations.

6. Microbiological tests: Because hyperpigmentation is not a specific leprosy lesion, smear test was performed for those individuals who were diagnosed as a suspected case by the dermatologist.

7- All biopsy specimens were sent to the pathology laboratory.

The research process is presented in figure 1.

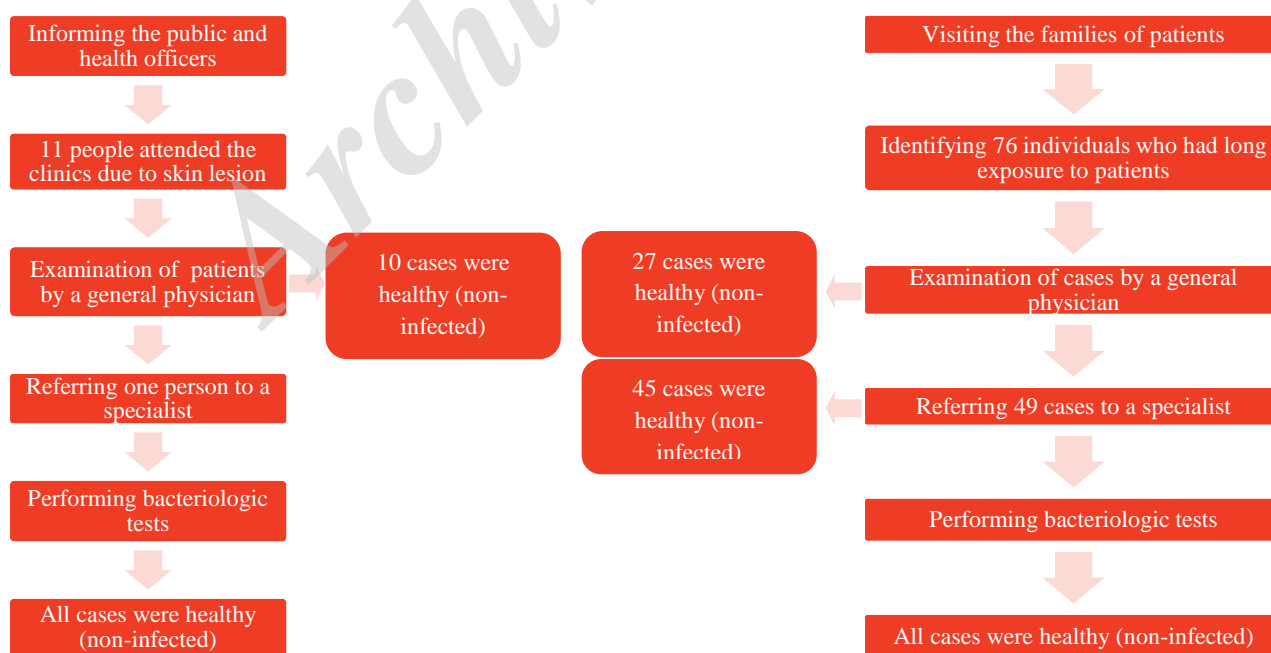


Figure 1. The study process and stages

Results

After informing the public and training health staff, 11 patients referred to the general physician because of skin lesions. After examination and approval, 2 patients who had the symptoms were referred to a general physician; 1 was referred as a probable case. The families of ex-patients were assessed and 76 people who had long exposure to ex-patients were invited to be examined by trained general physicians.

Hyperpigmentation is not regarded as a specific lesion for the diagnosis of leprosy. Thus, all 50 suspected cases (in active and passive case finding) were examined by the dermatologist, and based on the examination, 5 of them were assessed and examined as the final suspects, and skin smear test was performed for them (Table 1). The main characteristics of these 5 people are as follow:

First Person: He is the son of an ex-patient with a history of 11 years of exposure (from 1998 to 2009, died in 2009) is 58 years old, a laborer, and illiterate, and lives in a rural area. He was identified and referred due to physical

weakness (Figure 2 a).

Second person: She is the wife of an ex-patient, is 57 years old, a homemaker, and illiterate and lives in an urban area. She was identified and referred due to hyperpigmentation in hand and problems in eyelids (Figure 2 b).

Third Person: He is the son of a leprosy patient, is 40 years old and a laborer, has a primary school degree, and lives in an urban area. He was identified and referred due to multiple wounds that did not improve (Figure 2 c).

Fourth Person: The fourth individual is a male tailor of 25 years of age, lives in an urban area, and has a high school diploma. Following public training and inactive case detection he referred for examination due to spots on the skin that did not improve (Figure 2 d).

Fifth person: She is the wife of a leprosy patient with a history of 11 years of exposure, is a 60 year-old illiterate, housewife, and lives in an urban area. She was identified and referred due to severe hyperpigmentation in the whole body (did not allow to take photos).

Table 1. Distribution and characteristics of suspected cases who were referred to a dermatologist

| Variables | Groups | n (%) |
|---------------------|---------------------------------|---------|
| Sex | Male | 22 (44) |
| | Female | 28 (66) |
| Age group | 0-20 | 15 (30) |
| | 21-40 | 11 (22) |
| | 41-60 | 13 (26) |
| | 61 and older | 11 (22) |
| The place of lesion | Foot | 5 (10) |
| | Hand | 13 (26) |
| | Body (Trunk) | 6 (12) |
| | Head | 2 (4) |
| | Whole body | 4 (8) |
| | Others or mixed | 20 (40) |
| Lesions | Hyperpigmentation | 9 (18) |
| | Hypopigmentation | 4 (8) |
| | Deformity | 8 (16) |
| | Other symptoms or a mix of them | 29 (58) |
| Residential area | Urban | 17 (34) |
| | Rural | 33 (66) |

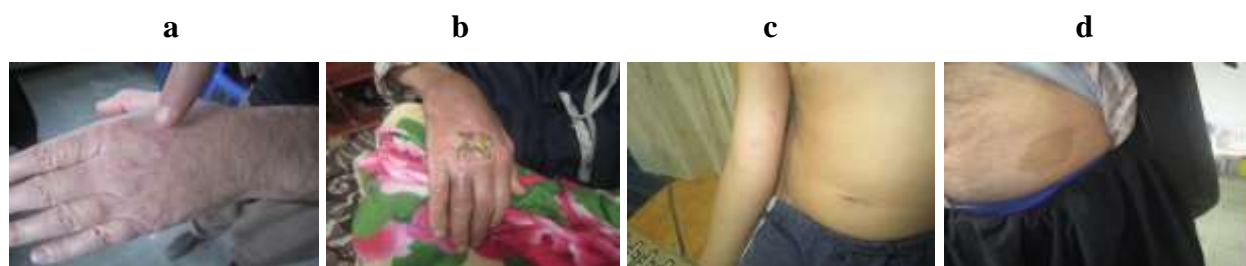


Figure 2. The main skin characteristics of 5 individuals in the second step of the leprosy elimination campaign (LEC) in Baneh

Smear samples were taken from all cases. Reviewing the smear samples showed that none of them were infected with leprosy. Based on the differential diagnosis, appropriate treatment was prescribed.

Discussion

Following the implementation of LEC in Baneh, we detected and examined 76 people in the first phase, 50 people in the second phase, and 5 people in the third phase. The results showed that none of them were infected with leprosy.

In a study that was conducted in Bandar Abbas, elderly patients (based on the leprosy registration system) and their families and close contacts were included (collectively 1861 people). Finally, 509 patients were evaluated; 15 people were willing to do a biopsy, among whom 20 suspected cases and 3 confirmed cases were identified.¹⁵ In a LEC study in Kermanshah Province in the West of Iran in 2012, which coincided with our study, 4 cities with the highest rate of leprosy cases during recent years were studied.¹⁶ Case detection was performed for the families of 90 ex-patients, which covered 178 people. As a result, 32 suspected cases were found. After referral to a specialist for further examinations, only 2 cases with minor injuries were confirmed.¹⁶ In a study by Qasemi-Barqi *et al.* which was conducted in Qazvin in Central Iran from 2006 to 2007, a total of 1987 people (1379 exposed cases, 319 patients, and 608 cases living in 3 endemic villages with a high prevalence of leprosy) were examined for the diagnosis of leprosy. Accordingly, 256 suspected

cases were identified, from which a total of 13 cases were diagnosed as definite new cases.¹⁷ Active case finding requires a great deal of money and efforts to identify a small number of patients and it might cause some problems, for instance it might increase the risk of over-diagnosis up to 25%.¹⁷⁻¹⁹ The rate of over-diagnosis was much more significant in our study. Hence, it seems that LEC is not cost-effective in areas with a low prevalence of leprosy. In a study by Ebenso *et al.*, which was conducted from 13 August to 30 November 1998, the effects of LEC and its treatment outcome were assessed in 37 provinces of Sokoto and Zamfara states in Nigeria. First, health personnel were trained and a total of 353 unknown cases of leprosy were detected.¹⁹ In a study entitled LEC Technical Report, which was carried out in 3 districts in the West of Hunan Province in China in 2001, 249 suspected cases of leprosy and 34 definite new cases of leprosy were identified.²⁰ A limitation of our study was the lack of a dedicated and pervasive media to educate people in the area. Hence, the training programs might not have covered all the people who were living in the area.

Burden of the disease would have been evaluated if a number of patients had been diagnosed with it. Nevertheless, since no cases of leprosy were discovered in this program, the burden of disease is 0. When the burden of disease in a population is 0, the cost of public education and screening against that disease is high. This strategy was compared with the sensitivity of passive surveillance performed 2

years prior to the implementation of this method. As a result of which, 7 confirmed patients were identified in the province (1 of them was from Baneh). However, in the LEC study, no patients were identified. In India, in areas with high prevalence of leprosy, modified leprosy elimination campaign (MLEC) has led to the identification of 0.99 million new cases.² The above studies show that LEC has led to different results in different countries. LEC has some advantages, for instance it increases public and professional awareness on the disease and it leads to the treatment of hundreds of thousands of detected cases of leprosy. In some countries, LEC has had an important role in the integration of services.^{20,21} This program has led to the identification of areas with high incidence in certain cases, treatment, reduction of deformity, reduction of transmission, and increasing of cases to be treated.²²

However, in many countries, it is necessary to reevaluate the effectiveness of LEC in active case detection.¹³ According to the WHO, this strategy has some weaknesses. Patients detected via active case detection are less motivated to complete MDR than self-reported patients. Additionally, active case detection could jeopardize the effectiveness of integrated health services, so that sometimes patients with other symptoms may become suspected of leprosy and may be referred to specialized services and be examined and treated wrongly.¹³ Additionally, home visits may increase stigma. The term "leprosy elimination campaign" may lead to an incomplete understanding of the leprosy elimination program among administrators and motivate them to spend more resources and make specific planning for health services that are not necessary.¹⁸

Conclusion

The implementation of LEC in places like Baneh, which is close to eliminating leprosy, is

not cost-effectiveness. In areas where the social and economic situation of the people have changed and people have increased level of literacy and education, the authorities should not insist on implementing LEC.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

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