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Prevalence of HIV in Leprosy Patients in Central Myanmar during 2008

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Abstract

HIV infection has been shown to be strongly associated with the development of active tuberculosis. However, its association with leprosy was much less clear. Moreover, seroprevalence of HIV infection among leprosy patients has never been reported in Myanmar. This study aimed to determine the seroprevalence of HIV among leprosy patients and the association between HIV infection and types of leprosy in central Myanmar during 2008. A total of 299 leprosy patients, including 242 multibacillary (MB) and 57 paucibacillary (PB) leprosy patients, were enrolled. The overall HIV seroprevalence was 3.7%, with 4.1% in MB leprosy patients and 1.8% in PB leprosy patients. Fifty MB leprosy patients (20.7%) had history of multi-drug therapy (MDT) and 4 of them (8.0%) were HIV infected. Six out of 192 MB leprosy patients without history of MDT were HIV infected (3.1%). MB leprosy cases with history of previous treatment had greater prevalence of HIV infection. Further study should be considered whether HIV infection may cause difficulty to cure leprosy and additional MDT course may require in HIV infected leprosy patients with previous history of MDT.

Keywords: HIV, leprosy, coinfection, Myanmar

Introduction

In January 2003, leprosy had been eliminated in Myanmar as the prevalence rate reduced below one case per 10,000 population.[1] However, during 2011, 3,082 new cases with 18 relapse cases were reported. Almost all paucibacillary (PB) leprosy patients (94%) and multibacillary (MB) leprosy patients (94%) were cured.[2] Sustainability of leprosy elimination is mandatory after achieving the goal.

Leprosy is classified as paucibacillary or multibacillary according to its infectious form. Patients with PB leprosy and HIV may progress to MB leprosy.[5] The HIV infected leprosy patients are more likely to manifest advanced stages of leprosy than HIV uninfected patients.[6] In addition, HIV infection may be associated with increased frequency of relapse in leprosy.[7]

Although HIV infection was shown to be strongly associated with the development of active tuberculosis and diseases caused by other mycobacteria, its association with leprosy was much less clear.[3] Vinay et al reported in 2009 that the incidence of leprosy in patients receiving anti-retroviral treatment was 5.2 per 1,000 person-years.[4] As this was much higher than the incidence of leprosy in general population, the authors suggested regular examination of leprosy in HIV infected individuals.[4] In addition, seroprevalence of HIV infection among leprosy cases was still unclear in Myanmar.

Hence, it is essential to detect HIV infection in areas where leprosy is prevalent for better understanding of risk of mycobacterial diseases and better care of leprosy patient with HIV. Early detection of HIV coinfection in leprosy patients may be valuable in sustaining of leprosy elimination.

This study aimed to determine the HIV seropositivity among registered leprosy patients and identify the association between HIV infection and types of leprosy in 10 townships of central Myanmar in 2008. According to the National Statistics of Leprosy Control Program, leprosy hot spot areas were in the central Myanmar.

Method

On individual assigned date during the period from January to December 2008, 179 registered leprosy patients were invited to the nearest rural health centers (RHCs) in 10 townships of central Myanmar and their consent was obtained to participate in the study. As some patients could not come to RHCs,

research teams visited their houses to obtain their consent. Moreover, additional 120 registered leprosy patients were requested to participate in the study when they visited Mandalay Special Skin Clinic for follow-up and monthly multi-drug therapy (MDT). All registered leprosy patients currently taking MDT in the study townships were included. The study protocol was approved by the "Ethical Committee on Medical Research Involving Human Subjects" from Department of Medical Research (Central Myanmar).

Among total 299 leprosy patients participated in this study, 35 were under 18 years old. Thus, legal guardians of 35 patients and 264 eligible patients were informed about the research study and their consent was obtained. HIV pretest counseling and data collection using semi-structured questionnaire were conducted by trained interviewers. From each patient, 2 ml of venous blood and at least two slit skin smears were collected by local health workers. Personal identification was kept confidential and samples were coded as well.

Slit skin smears were immediately heat fixed and stained using modified Ziehl Neelsen stain. Then, microscopic examination was carried out by a microbiologist and two trained technicians independently[8] in Department of Medical Research (Central Myanmar).

Venous blood samples were maintained at 2-8°C, and sera were separated and stored temporarily at clinical laboratories of the nearest district hospitals, which were then transported to bacteriology research unit of Department of Medical Research (Central Myanmar). The samples were tested for HIV using ELISA (Microlisa HIV kit from J. Mitra & Co. Pvt. Ltd, India) and the positive samples were confirmed by Western Blot test (LAV Blot 1 test kit from Bio-Rad).

Descriptive analysis of socio-demographic information, type of leprosy, risk behavior and results of HIV test were conducted using SPSS version 16.0. Fisher exact test was employed to determine the association between HIV seropositivity rate and type of leprosy.

Results

Of total 299 leprosy patients participated in this study, there were more MB leprosy patients (80.9%) than PB leprosy patients (19.1%) (Figure 1) and male to female ratio was 1.6:1. Although 55 patients had history of previous MDT treatment for leprosy, they seemed to be defaulters because they did not answer whether the medication was completed or not. A total of 11 patients were confirmed to have HIV infection which included 10 MB cases and one PB cases.

Median age of MB patients was higher than PB patients, however was not statistically significantly. Moreover, gender was not different between both types of leprosy either. Number of patients taking steroid treatment for lepra reaction was significantly prominent in MB patients. More MB patients had positive result of slit skin smear compared with PB patients. Risk behaviors for HIV infection and seropositivity rate were not significantly different between both groups (Table 1).

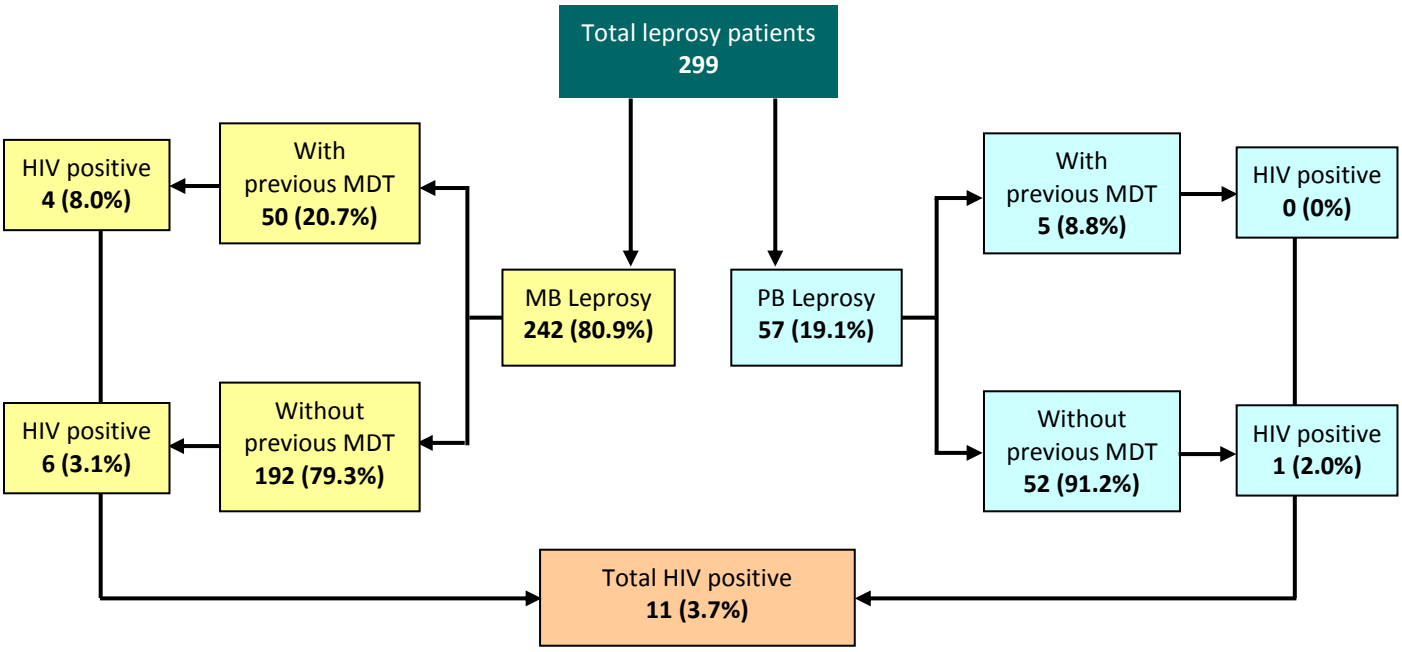

Figure 1. Multibacillary (MB) and paucibacillary (PB) leprosy patients and HIV infection in central Myanmar, 2008

Table 1. Epidemiological and clinical characteristics of leprosy patients in central Myanmar, 2008 (n=299)

Characteristic	Type of Leprosy[1]				P-value
	Multibacillary (MB) leprosy (n=242)		Paucibacillary (PB) leprosy (n=57)		
	Number	Percent	Number	Percent	
Median age (Range)	35.29 years (1-77)		31.84 years (3-76)		0.058
Male gender	155	64.0	29	51.0	0.071
Residency in rural area	133	55.0	33	58.0	0.768
Underlying medical conditions					
Diabetes	2	0.8	1	1.8	-
TB	3	1.2	1	1.8	-
Asthma	13	5.4	4	7.0	-
Taking steroid for lepra reaction	81 (n=236)	34.0	9 (n=55)	16.0	**0.019**
BCG scar	64	26.0	17	30.0	0.621
Risk behavior for HIV infection					
History of blood transmission	25	10.0	7	12.0	0.638
History of IDU[2]	29	12.0	6	10.0	0.845
History of STD[3]	14 (n=240)	6.0	1	1.8	0.353
History of partner's STD	4 (n=181)	2.0	0 (n=39)	0.0	0.408
Contact with CSW[4]	17 (n=125)	14.0	3 (n=24)	12.5	0.427
History of homosexual	10 (n=125)	13.0	1 (n=24)	4.0	0.344
History of multiple partners	21 (n=125)	17.0	2 (n=24)	8.0	0.247
Slit skin smear positive	104	43.0	5	9.0	**<0.001**
HIV positive	10	4.0	1	1.7	0.697

[1] *Variables with denominators less than the total number were indicated.*
[2] *IDU - Injection drug user*
[3] *STD - Sexually transmitted diseases*
[4] *CSW - Commercial sex worker*

Although median age of HIV infected patients was higher than that of the uninfected patients, result was not statistically significant. More male leprosy patients had HIV infection apparently than female patients. HIV infected leprosy patients had received previous multi-drug treatment (MDT) more than HIV uninfected leprosy patient. Risk behaviors, slit skin smear result and previous MDT treatment were not statistically significant between HIV infected and uninfected leprosy patients (Table 2).

Discussion

Myanmar reported 3,082 new cases of leprosy in 2011.[1] Among them, MB leprosy accounted for 70% and 35% was female.[9] This study was carried out in communities as well as a specialist clinic. Enrollment of participants was prominent numbers in MB cases and male patients.

This study revealed that median age of all participants was 34 and was not significantly different between MB and PB groups. However, Moet et al reported a bimodal distribution of leprosy by age that the risk increased for those 5-15 years of age, reached a peak for 15-20 years, decreased for 20-29 years and gradually increased again after a 30-year lag.[10] Other studies had shown that the risk of leprosy among contacts was significantly higher for those younger than 14 years, particularly for contacts of MB patients.[11]

Among new leprosy patients, Myanmar National Leprosy Control Program detected 20 relapse patients in 2008 and 18 in 2011.[1,9] Although high number of patient with previous MDT was observed in this study, there were two things to consider. First, their medication might not complete. Second, symptoms of reaction and symptoms of relapse could be confusing.

Table 2. Distribution of risk behaviors among leprosy patient and HIV infection in central Myanmar, 2008

Characteristic	HIV infected patient (n=11)		HIV uninfected patient (n=288)	
	Number	Percent	Number	Percent
Median age (range) (n=268)	43 years (20-74)		30 years (1-77)	
Male gender	9	81.8	159	55.2
Residency in rural area	7	63.6	159	55.2
Type of leprosy				
PB	1	9.1	56	19.4
MB	10	90.9	232	80.5
Slit skin smear positive	3	27.3	106	36.8
With previous MDT	4	36.4	51	17.7
Risk factor among adult (age >14 years)	(n=11)		(n=257)	
History of blood transfusion	2	18.2	30	11.7
History of IDU	1	9.1	31	12.1
History of STD	0	0	15	5.8
STD in partner	0	0	4 (n=200)	2.0
Risk factor among male	(n=9)		(n=164)	
Sex with CSW	1	11.1	17	10.4
History of homosexual	0	0	9	5.5
Multiple partner	0	0	21	12.8

A patient may develop nerve damage and reactions even more than three years after completing MDT. Specialist opinion is often required to differentiate whether they are really experiencing a reaction, but not relapse of leprosy.[12]

HIV seropositivity of leprosy patient in this study was 3.7% which was much higher than that of general population (0.5%) reported by Myanmar National AIDS Program (NAP).[13] Moses et al reported in 2003 that HIV infection was more prevalent among leprosy patients than blood donors in Nigeria.[14] Alternatively, another study reported in 2009 that the incidence of leprosy in patients receiving anti-retroviral treatment was much higher than that of the general population.[4] HIV seroprevalence in leprosy patients ranged from 0.3% to 33.3% in studies conducted in India, Brazil and African countries.[7]

High proportion of Injection Drug Users (IDU) history among leprosy patients was noticed while prevalence of IDU among 15-64 years old expressed 0.2% in 2007.[15] HIV sentinel surveillance (HSS) by Myanmar NAP reported that median of HIV prevalence among IDU was 20.3% (range 11.0-32.5%)[13] and this group among leprosy patients may need to be observed.

In this study, HIV infection was not shown to be associated with the type of leprosy. It was premature to conclude that leprosy was the risk for developing advanced stage of HIV and vice versa. Pereira et al in 2004 and Sarno et al in 2011 concluded that antiretroviral therapy (ART) and immune reconstitution were critical factors driving the development and/or clinical appearance of leprosy lesions.[16,17] On the contrary, another study in 2005 showed that neither leprosy or HIV infection precipitated the other.[18] As ART coverage among Myanmar people reached 24% in 2010[19] and has been increasing, a study on coinfection of leprosy and HIV with or without ART should be considered in order to understand more on the two diseases of the most stigmatic.

Limitations

Information on risk behaviors was not available from children less than 14 years. Similarly, female patients were not assessed for extramarital sexual behaviors.

Public Health Actions and Recommendations

The authors recommended that as the number of HIV patients was small, further coinfection study on leprosy and HIV should be considered. Information on HIV risk factors is limited in this study. Thus, higher number of leprosy patient is required to obtain more information on risk factors and nationwide scale-up study should be considered. Permanent or mobile specialist skin clinics should be provided in leprosy pocket areas to differentiate between reaction and relapse among treated leprosy patients, especially patients with HIV infections.

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