



Follow-up Study of Patients Previously Diagnosed with Lymphatic Filariasis in Korea

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Objectives: Korea was an endemic area for lymphatic filariasis (LF), caused by the nematode parasite *Brugia malayi*, until the 1970s. The World Health Organization recognized Korea as LF-free in June 2008. However, it is necessary to confirm that patients that have had LF in the past still test negative, to prevent the re-emergence of LF in Korea.

Methods: We followed up a total of 83 patients who had been diagnosed with LF between 2002 and 2010 in endemic LF areas.

Results: Fifty-two of the 83 subjects were negative for LF, whereas 31 subjects had re-located to a different city or province, were dead, or were unaccounted for. Most subjects with negative test results still exhibited edema in the legs or the arms, and some complained of redness and swelling in the legs or ankle joints. However, we found that these symptoms were due to diseases other than LF.

Conclusion: In this follow-up study, we did not find any evidence indicating the potential re-emergence of LF in Korea.

Key Words: lymphatic filariasis, *Brugia malayi*

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INTRODUCTION

The scientific identification of lymphatic filariasis (LF), which includes elephantiasis, was conducted for the first time in Korea in 1927 [1]. While it was originally thought that LF was caused by *Wuchereria bancrofti*, in 1943, Senoo [2] clarified that LF in Korea was caused by *Brugia malayi* instead. The first nationwide survey on patients with LF was conducted in the 1950s, which involved an analysis of 5,001 night blood smears in 25 randomly selected villages in Jeju-do [3]. The study showed that 12.1% (604/5,001 cases) of the samples were positive for microfilaria caused by *B. malayi*. Three subsequent epidemiological studies indicated the following positive rates: 9.2% (19/206 cases) [4], 11.4% (26/229 school children), 22.2% (79/356 inhabitants) [5,6], and 8.6% (184/2,139 inhabitants) [7]. These data strongly suggested that there were three major endemic foci of LF in Korea: the northeastern part (inland) of Gyeongsangbuk-do, and the western coastal areas of Jeollanam-do and Jeju-do. Jeju-do was found to be highly endemic, whereas the other two areas were found to be moderate-to-low endemic. During the early 1970s, chemotherapy was implemented in several regions endemic for LF with satisfactory results. In Yeongju-si, one of the main LF foci in Gyeongsangbuk-do, a remarkable decrease in



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LF prevalence was achieved, which resulted in complete disappearance of the disease during the observation period [8]. However, western remote islands, such as Heuksan-do, were identified as new endemic areas of LF during the 1980s [9]. A recent epidemiological study, however, revealed that this area is now LF-free [10,11].

In this study, we report the epidemiological data of the follow-up on 83 patients who were identified in the past as affected by LF during the LF elimination survey program of the Korea National Institute of Health between 2002 and 2010 in previously endemic areas.

MATERIALS AND METHODS

Peripheral blood (20 μ L) was collected by capillary from the ear lobe or finger of villagers during house-to-house visits between 20:00 and 02:00. The commercially available dipstick

kit Brugia Rapid™ (Malaysian Bio-Diagnostics Research Sdn Bhd., Selangor Darul Ehsan, Malaysia) was used to detect anti-*B. malayi* antibodies. The kit was prepared with a goat anti-mouse antibody control line and *B. malayi* recombinant antigen test line. The presence of anti-filarial antibodies in subjects' sera was tested according to the manufacturer's instructions using the filarial antigen and colloidal gold-conjugated monoclonal anti-human immunoglobulin G4 provided in the kit. Blood from patients with elephantiasis was stained with Giemsa and examined under a light microscope.

RESULTS

In this study, we examined subjects who were previously diagnosed with elephantiasis of the lower or upper extremities due to LF; some of them had shown causative LF symptoms until 2010. The subjects were 60-to-98-years-old. A total of 52 subjects had

Table 1. Test results of patients with lymphatic filariasis

Area			Patient (n)	Test results	Memo
Jeollanam-do	Jindo-gun	Cheongdeung island	1	-	1 Dead
		Dokgeo island	1	-	1 Dead
		Jukhang island	1	Negative	-
Sinan-gun		Gageo island	8	Negative	-
		Manjae island	1	-	1 Transfer
		Heuksan island	6	Negative	1 Dead 1 Transfer
		Hong island	1	Negative	
		Wando-gun	Pyeongil island	1	Negative
		Yeoseo island	2	Negative	1 Transfer
		Cheongsan island	3	Negative	1 Dead
		Dasan island	2	-	1 Dead 1 Transfer
		Sojin-ri	3	Negative	1 Transfer
		Seonoup island	1	-	1 Transfer
Yeosu-si		Bogil island	11	Negative	2 Dead 1 Transfer
		Sogeomun island	1	Negative	-
		Geomun island	4	Negative	3 Missing
Jeju-do	Jeju-si	Chuja island, Gujwa-eup, and Hangyeong-myeon	16	Negative	9 Dead
		Seogwipo-si	Namwon-eup and Pyosun-myeon	20	Negative
			83	All negative	

Transfer, patient moved to a different city or province; Missing, missing person.



Figure 1. Images of the (A) lower and (B) upper extremities of two patients who previously had elephantiasis, Gageo island, Jeollanam-do, 2010.

a negative test result, while 31 had moved to a different city, were hospitalized for a reason other than LF, or had died (Table 1 and Figure 1).

Most of the subjects still exhibited edema in the lower legs or arms, and some complained of redness and swelling in the legs or ankle joints. However, we could not find microfilaria in their blood and found that the redness and swelling in their legs and/or ankle joints were due to other diseases such as rheumatoid arthritis or cellulitis.

DISCUSSION

Elephantiasis of the lower extremities was traditionally called Soojongdari or Darijeongeung (leg dropsy or king leg, respectively, translated to English). In Korea, when lymphangitis and lymphadenitis is associated with fever and transient joint swelling, this disease is called Pinaerim (blood down-flow), Pijeong (blood disease), or Gakmomsal (malaise with arthralgia) [12]. Korean elephantiasis mainly affects the lower extremities and occasionally the arms; however, it has not been reported to involve

the external genitalia [13].

In the past, LF has been diffused in mainly coastal areas of Korea, such as Jeollanam-do and Jeju-do. However, a continuous effort of the Korean government, such as installation of mosquito nets and sanitation of houses, has resulted in the elimination of LF in Korea [14]. This survey and follow-up study for patients who previously had filariasis confirms that LF has been completely eliminated in Korea.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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