

## Research article

# Knowledge on Leishmaniasis among Health Care Workers in an Endemic Area

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## Background

Anuradhapura has one of the highest incidences of Leishmaniasis in Sri Lanka. Our aim was to assess the knowledge on Leishmaniasis among health care workers except medical officers in Anuradhapura in order to identify the gaps in the health system for improvement of knowledge among health staff.

## Methods

A descriptive cross sectional study was carried out among healthcare workers (excluding medical officers) working in all Medical Officer of Health areas of the Regional Director of the Health Services division, Anuradhapura. Data were collected through a structured self-administered questionnaire from June 2013 to January 2014. Questionnaire consisted of questions related to the knowledge on symptoms and signs of the disease, treatment, prevention and control.

## Results

Altogether, 212 males and 588 females participated. Of them, 97.1% (n=776) had heard about the disease before; 89.4% (n=715) knew that this is a parasitic disease and the mode of transmission was known to 97.8% (n=782). Commonly affected body parts and at risk groups were known to 95.2% (n=761) and 55.2% (n=441) respondents, respectively. Around 90% (720) were aware of the role of dogs as reservoirs. Early diagnosis and treatment was mentioned as the main control measure by 77.8% (n=622) of the participants.

## Conclusion

Majority of healthcare workers had adequate knowledge about the disease. They can play an important role in case suspicion and referral to the relevant authority, prevention and help for timely treatment of Leishmaniasis.

**Keywords:** Leishmaniasis; Healthcare worker; Awareness; Sri Lanka

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## Introduction

Leishmaniasis remains an important public health problem with an estimated global prevalence of 12 million cases and an annual incidence of 1.3 million and 20,000 to 30,000 deaths occurring annually (1, 2). Disease notification is compulsory only in 33 countries out of the 88 affected by Leishmaniasis. Therefore, a substantial number of cases are never reported. Even in countries where the notification is compulsory, a number of published literature clearly show that there is a gross under estimation of the true disease burden due to lack of clinical suspicion.

History of Leishmaniasis in Sri Lanka (then Ceylon) goes back to 1904, during the year which, visceral Leishmaniasis caused by *Leishmania donovani* in an English patient was suspected as originated from Sri Lanka (3,4).

Leishmaniasis is an endemic disease in Sri Lanka since the first autochthonous cutaneous Leishmaniasis case was identified in 1992 (5). In 2003, the causative species was identified as *Leishmania donovani zymodeme* MON-37 (6). DNA sequencing and microsatellite analyses showed that these parasites are closely related to those causing visceral leishmaniasis in the Indian subcontinent (7). Mucocutaneous and visceral involvements were first reported in 2005 (8) and 2007 (9) respectively in Anuradhapura.

Although occasional cases were reported from all the provinces, Leishmaniasis is considered endemic in southern and north-central provinces, with more than 1500 cases annually (10, 11, 12). Over 99% of reported cases from 2007 to 2012 were cutaneous Leishmaniasis, while not more than ten cases were mucocutaneous. There were six cases of visceral Leishmaniasis (10, 11).

Until recent years, this has been a neglected disease locally and was thought to be a disease of military personnel (6, 7). Recent literature (10, 11, 13,14) showed that this was a disease of locals, where farmers and children who engaged in outdoor activities were the mostly affected. With increased case finding and identification of this disease, it became an important public health problem. National strategies on Leishmaniasis control were prepared which included creating awareness, implementing surveillance and improving clinical management (15).

As a part of these activities, medical officers, nurses, public health midwives, public health inspectors, paramedical health staff, pharmacists, drivers and health assistants in Anuradhapura district were trained on disease prevalence, importance of clinical suspicion, early diagnosis, management, prevention and community education of Leishmaniasis. By training of all health care workers authorities aimed to improve timely referral of Leishmaniasis patients to the Dermatology units. However, whether these programs were effective in improving knowledge on Leishmaniasis was not formally assessed. The objective of the present study was to assess the knowledge on Leishmaniasis among healthcare workers, except medical officers, in all medical officer of

health areas of Regional Director of Health Services Division Anuradhapura.

## Methods

### Study setting and study sample

This cross sectional descriptive study was carried out in all Medical Officer of Health (MOH) areas of Regional Director of Health Services (RDHS) Division Anuradhapura, Sri Lanka, from June 2013 to January 2014. In RDHS Anuradhapura, curative care services are delivered through a teaching hospital, three base hospitals and 34 divisional hospitals. For public health services, Anuradhapura district is divided into 19 MOH areas. Study population consisted of nurses, public health midwives, public health inspectors, paramedical health staff, pharmacists, attendants, drivers and health assistants excluding medical officers in RDHS Division Anuradhapura. Medical officers were excluded because they are mainly involved in the management part. Study sample was selected using convenient sampling method and we tried to include 50% of the study population. All healthcare workers were invited and those who were willing to participate and work were recruited for the study.

### Data collection

Data were collected through a structured self-administered questionnaire with open ended questions. The questionnaire consisted of questions related to the clinical presentations of the disease, risk factors and the sources of information. Their knowledge on prevention and disease control were also assessed. Participants were approached by visiting health institutions as well as during regular regional/ divisional meetings of public health staff.

### Analysis

All analyses were performed using IBM SPSS Version 21.0 (IBM Corp., Armonk, New York, NY and USA). Knowledge on Leishmaniasis was presented as proportions and percentages.

### Ethical considerations

The study protocol was approved by the Ethics Review Committee Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka. Informed consent to participate in the study was obtained from all participants.

### Results

Total of 900 participants were recruited for the study, of which 880 (97.0%) completed it. Of them, 80 (9%) were excluded from final analysis due to incomplete data and /or illegible writing. The final study sample included 800 (91%) health personnel.

### Socio-demographic characteristics of the study sample (Table 1)

The study sample included 212 men (26.5%) and 588 women (73.5%) from eight health care categories in Ministry of Health Sri Lanka. Majority (38.0%) of them were public health midwives (PHMs). The age ranged from 23 to 59 years, where the highest number (31.2%)

was within 41 to 50 years and almost comparable number (30%) was within 51 to 60 years. Data on educational level were available for 791 (98%) of the respondents. The study population showed a high literacy rate, none were illiterate, and lowest level of education were grade six.

**Table 1: The socio-demographic profile of the study sample participated in Leishmaniasis knowledge assessment survey (n=800)**

Characteristic	N (%)
<b>Sex</b>	
Male	212 (6.5)
Female	588 (73.5)
<b>Age</b>	
20 - 30 years	80 (10)
31- 40 years	230 (28.8)
41 - 50 years	250 (31.3)
51 - 60 years	240 (30)
<b>Occupation</b>	
Public health midwives	304 (38)
Attendants	169 (21.1)
Health assistants	130 (16.3)
Nurses	112 (14)
Drivers	26 (3.25)
Other paramedical staff	23 (2.8)
Public health inspectors	20 (2.5)
Pharmacists	16 (2)
<b>Educational level</b>	
Degree/diploma	26 (3.3)
Advanced level	471 (59.5)
Ordinary level	258 (32.6)
Grade 9 or less	36 (4.5)

**Table 2: Awareness of Leishmaniasis and knowledge about the disease**

	Response	N (%)
<b>Ever heard about Leishmaniasis?</b>	Yes	777 (97.1)
	No	23 (2.9)
<b>If Yes, what is the source of information?</b>		
Television		211 (26.4)
Newspapers		206 (25.8)
Leaflets		367 (45.8)
Lectures		386 (48.2)
<b>Experience of the disease</b>		
Respondent him/ herself		4 (0.5)
Family member		30 (3.7)
Neighbours		66 (8.3)
<b>Disease of parasitic infection?</b>	Yes	715 (89.4)
	No	85 (11.6)
<b>Transmitted by sand fly bite?</b>	Yes	782 (97.7)
	No	18 (2.25)
<b>Risk groups</b>		
Farmers		445 (55.2)
Armed forces		439 (54.7)
School children		303 (37.8)
<b>Dog as reservoir?</b>	Yes	720 (90)
	No	80 (10)

The highest number (n=77, 9.6%) of participants were from Nuwaragampalatha East MOH area which is one of the highly prevalent areas of Leishmaniasis in Anuradhapura district.

#### Awareness on Leishmaniasis (Table 2)

A major fraction (97.3%) had heard the name of the disease. Nearly half (48.2%) had attended the awareness programmes and 45.8% had gained knowledge by health education leaflets, 25.6% by the television and 25.7% by newspapers.

The type of the disease was known to a majority (89.37%) as a parasitic disease. Only 12.5% (n=100) were directly affected by the disease; 0.5% healthcare workers him/herself, 3.75% their family members and 8.5% their neighbours have had cutaneous Leishmaniasis. Mode of transmission was known to 97.75% as a sand fly bite. More than half (55.4%) stated that commonly affected were farmers. Ninety percent knew the possible role of the dog in transmission of the disease and 10% were unaware about the reservoir.

#### Awareness on signs and symptoms of cutaneous Leishmaniasis (Table 3)

Major fraction (95.3%) knew that the commonly affected body part was skin. More than 70% knew plaques and papules as common skin manifestations and only a minority (16.5%) stated the common presentation as skin rash (Table 3). Nearly one third (32.1%) knew that the majority of lesions were asymptomatic, although 8.5% thought that cutaneous Leishmaniasis was very painful.

**Table 3: Awareness of Leishmaniasis – Knowledge on clinical manifestations**

	Response	N	%
Commonly affected body part is skin	Yes	762	(92.3)
	No	38	(4.8)
Knowledge on signs			
Skin rash		132	(16.5)
Plaque		303	(37.8)
Papule		281	(35)
Ulcer		316	(39.5)
Knowledge on symptoms			
Asymptomatic		257	(32)
Very itchy		160	(20)
Very painful		68	(8.5)

**Awareness on disease control, preventive practices and treatment (Table 4)**

A large proportion (77.75%) stated that the disease could be controlled by early diagnosis and early treatment. More than 70% of the respondents stated that the disease could be prevented by covering the body with clothing, especially those who were engaged in outdoor activities. Only 10.75% thought that mosquito nets can prevent sand fly bites. All the respondents mentioned that the action taken after a suspected patient was encountered was to refer him/her to the nearest medical institution or the skin clinic. None mentioned over-the-counter antibiotics as treatment.

**Table 4: Awareness of Leishmaniasis – Knowledge on disease control, preventive practices and treatment**

	N	%
Probable control/preventive strategies		
Early diagnosis and treatments	622	(77.8)
Using insecticides	76	(9.5)
Using covered clothes	587	(73.4)
Use of bed nets	86	(10.8)
Use of insect repellents	115	(14.3)
Reduce outdoor activities	392	(49)
Management of Leishmaniasis		
Refer to nearest medical institution	800	(100)
Take over-the-counter antibiotics	0	(0)

**Discussion**

The main objective of this study was to assess the knowledge on Leishmaniasis among healthcare workers and to identify the gaps in their knowledge to strengthen future health education programmes. Findings of this

study show a satisfactory knowledge on Leishmaniasis among non-physician healthcare workers.

The study sample was drawn from all nineteen MOH areas and the selected sample was represented a wide range of health related occupational categories except medical officers. We decided to exclude medical officers as they have already gained knowledge from the medical college, which does not represent in-service community health education programmes and they are mainly involved in management of the disease.

There was female predominance in this sample representing the normal distribution in health staff in Sri Lanka. In our study there was a large number of public health midwives included and it also contributed to the female predominance. Although health education programmes had been conducted in Anuradhapura district for nearly six years, only 48% of healthcare workers had participated showing lapses in these programmes. Major fraction of respondents had heard about Leishmaniasis. That shows the awareness programs which were conducted since 2008 have been effective. But their knowledge on some of the specific and important aspects was poor, such as prevention by bed nets, and signs and symptoms of the disease.

We observe several differences on knowledge related to Leishmaniasis among Sri Lankan healthcare workers compared to community based studies done elsewhere. Early diagnosis and treatment was the main control measure mentioned in our study compared to insecticide spraying in Syrian Arab Republic (16) and Istalif studies (17). This may be due to the fact that insecticide spraying is not a control strategy in Leishmaniasis control in Sri Lanka. Home remedies (17) and use of topical antibiotics (16) were common in community sample surveys from other countries. But referral to a nearest medical institution or dermatology clinic was the main action proposed by our study sample.

It seems that the best way in prevention and reducing the related problems of Leishmaniasis, considering high cost for treatment and scarcity of medicaments with acceptable safety and efficacy, is to enhance the knowledge of the healthcare workers as well as knowledge of the community on Leishmaniasis which result in early diagnosis. Early detection of the disease and early treatment will reduce the parasitic load and is the key to control Leishmaniasis in Sri Lanka. Having well trained technical personnel and an efficient delivery system is important to empower the public health system.

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