Is Leishmaniasis adequately notified in Sri Lanka? A survey among doctors from high endemic district of Sri Lanka.

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Abstract

Background : Leishmaniasis is a notifiable disease in Sri Lanka since 2008. Previous studies show a gap in the notification. Purpose of the present study was to determine the Knowledge, attitudes and practice of medical officers regarding leishmaniasis.

Methods : A cross-sectional study was conducted in Anuradhapura district which reported the highest prevalence of leishmaniasis. Participants from public and private health care institutes in the area filled a self-administered questionnaire in the presence of the investigators.

Results : One hundred and eighty-eight (188) medical officers (involved in treating 75,326 population) completed the questionnaire. Of them, 95.7% (n=177) were aware of leishmaniasis as a parasitic infection and 84.7% (n=155) correctly identified *Leishmania donovani* as the causative organism in Sri Lanka. From the respondents, 96.8% (n=181) knew that the vector of leishmaniasis is sandfly. Cutaneous leishmaniasis was reported as the most prevalent form of leishmaniasis in the country by 94.1% (n=176). Nearly half of the population (54.1%, n=98) was aware of the fact that Anuradhapura district has the highest prevalence of the disease. Many of them had the idea that leishmaniasis is an emerging disease (84.3%, n=155) and early diagnosis is important in controlling the disease (89.1%, n=163). Although about three fourth (73.7 %, n=123) of the population mentioned that leishmaniasis should be notified at first clinical suspicion, only 42.5% (n=74) were aware that it is a legal requirement. Some medical officers (22%, n=39) believed the current notification system in the country is not effective. Unavailability of notification forms (36.8%, n=60), heavy workload (50.3%, n=85) and inadequate supportive staff (35.1%, n=55) were reported as barriers for timely notification. Even though 58.0% (n=105) of medical officers had suspected leishmaniasis during last eight years period only 19.4% (n=35) had notified.

Conclusions : Even though more than 90% of the participants had good theoretical knowledge about leishmaniasis; notification of leishmaniasis is considerably inadequate. This study emphasizes the need for greater efforts to improve the notification of leishmaniasis in Sri Lanka. **Keywords :** Leishmaniasis, Notification, Physicians, Knowledge, attitude, practice, Sri Lanka

Introduction

Leishmaniasis is an emerging but neglected tropical disease with a global incidence of 0.7 to 1 million (1). Disease affected regions include Africa, America, East Mediterranean region, Europe and South-East Asia (2). Annual death count due to leishmaniasis is 26 000 to 65 000 across the globe (1).

The disease is a parasitic disease transmitted by the bite of an infected phlebotomine sandfly. It is known to manifest in 3 main forms; cutaneous leishmaniasis, mucocutaneous leishmaniasis and visceral leishmaniasis in humans (3). About twenty species or subspecies have been identified in relation to leishmaniasis in human. Cutaneous leishmaniasis is usually caused by *leishmania tropica* and *leishmania major*; *leishmania braziliensis* and *leishmania panamensis* are responsible for mucocutaneous leishmaniasis. Visceral leishmaniasis is a result of *leishmania donovani* and *leishmania infantum* infections. (4) While visceral leishmaniasis is the most fatal form of the disease, cutaneous leishmaniasis has been identified as the most prevalent form (2).

Epidemiology of the leishmaniasis depends on several factors related to the life cycle of the parasite, human behaviour and climate. Tropical climate facilitates the breeding of sand flies. Travelling to endemic countries and urbanization invading forest lands increase the chance of humans getting bitten by vectors. Poor socio-

economical status increases the risk of leishmaniasis. Malnutrition compromises the immunity aggravating the self-limiting disease into full-blown systemic illness. Poor housing and sanitary conditions (such as a lack of waste management or open sewerage) may increase sand fly breeding and resting sites, as well as their access to humans. Crowded houses attract sand flies providing good sources for their blood-meals. Human behaviours, such as sleeping outside or on the ground, may increase risk of sandfly bites.

Leishmaniasis is a notifiable disease in Sri Lanka since 2008 (5). Cutaneous leishmaniasis is the most prevalent form of the disease found in Sri Lanka and the causative organism has been identified as *leishmania donovani*, the organism which is mainly responsible for visceral leishmaniasis in the globe(6). The disease is highly endemic in the North Central province of the country which is a semi-urban area with the tropical climate. According to the latest annual health bulletin published by the ministry of health Sri Lanka, Anuradhapura had been reported as the second-highest incident rate per district (7). (But at the time of data collection highest incident rate was from Anuradhapura district for four consecutive years from 2012 to 2015 (8)).

Though it is a notifiable disease; it is evident that there is a gap between actual figures and the number of cases reported. According to a survey done in Mulathiv district of the northern province between 2011 and 2013, more than 200 cases of Leishmaniasis among military recruits had been missed from the national disease surveillance reports (9). This suggests that there is a problem in the notification system of the country. Knowledge, attitude and practices of medical officers play an important role in infectious disease control. However, there is no published data on studies done in the country regarding knowledge, attitude and practices of medical officers related to leishmaniasis or disease notification. The main objective of this study was to assess the Knowledge, attitude and practices of medical officers about leishmaniasis in a MOH area (a health unit headed by Medical Officers of Health) in Anuradhapura district.

Methods

Nuwaragampalatha East MOH area was selected as it caters for the highest number of doctors per MOH area in Anuradhapura district. All the medical officers (from both government and private sectors) in the selected MOH area were included in the study. To be included in the study, participants must have had a Bachelor of Medicine, Bachelor of Surgery (M.B.B.S.) or Doctor of Medicine (MD) or equivalent degree and be employed in a government or a private hospital. Other health care workers were excluded from the study as they are not directly involved in diagnosing and notifying the disease.

The data was collected during May 2016 to February 2017 using a self-administered, structured questionnaire developed by the investigators based on the "Leishmaniasis fact sheet" published by world health organization and "surveillance case definitions for notifiable diseases in Sri Lanka" booklet published by epidemiology unit, Sri Lanka (1),(10). The questionnaire was designed to assess the knowledge on disease prevalence, causative organisms, mode of transmission and vector, clinical features and treatment methods. It also consisted of questions on attitudes and practices regarding the disease and notification system. Investigators visited the medical officers at their working units and got the questionnaires filled by them in the presence of investigators. All participants provided informed written consent before filling the questionnaire. It took about fifteen minutes to fill the questionnaire by the respondents. The study protocol was reviewed and approved by the ethics review committee of the faculty of Medicine and Allied Sciences, Rajarata University, Sri Lanka.

Results

One hundred and eighty-eight (188) medical officers (involved in taking care of health issues of 75,326 population) from eight health care institutions completed the questionnaire. Majority of the respondents were from the Teaching hospital Anuradhapura (N = 152, 82.2%) which is the largest hospital in the selected MOH division. Demographic details and characteristics of the study population are summarized in Table 1.

Characteristics	No. (%) of Doctors	Mean (SD)
	(N= 188)	
Male	115 (61.5)	
Age		35.65 (8.95)
≤35	115 (61.5)	
36-45	41 (21.9)	
46-55	23 (12.3)	
≥56	8 (4.3)	
Service years		7.47 (7.89)
≤5	105 (57.4)	
6-15	50 (27.3)	
16-25	20 (10.9)	
≥26	8 (4.4)	
Current position		
Grade MO	119 (64)	
Intern MO	34 (18.3)	
Registered MO	17 (9.1)	
Consultant	10 (5.4)	
Private practitioner	4 (2.2)	
Registrars	2 (1.1)	

Table 01. Characteristics of the respondents

SD-Standard deviation, MO- Medical officer

(Total may not always sum to N due to missing data)

More than ninety-five per cent of the participants (n = 177, 95.7%) were aware that leishmaniasis is a parasitic infection and 84.7% (n = 155) correctly identified *Leishmania donovani* as the causative organism in Sri Lanka. From the respondents, 96.8% (n = 181) knew that the vector of leishmaniasis is sandfly. Cutaneous leishmaniasis was reported as the most prevalent form of leishmaniasis in the country by 94.1% (n = 176). Nearly half of the study population (54.1%, n = 98) was aware of the fact that the Anuradhapura district has the highest prevalence of the disease.

Skin ulcer was known by 86.6% (n = 162) as the commonest symptom of cutaneous leishmaniasis and 52.7% (n = 97) knew that skin lesions are asymptomatic. One hundred and twenty-five respondents (67.2%) agreed with the statement “diagnosis of cutaneous leishmaniasis is mainly clinical”. Majority of the participants (68.7%, n = 101)

selected intravenous/intramuscular Antimonials as the treatment option for leishmaniasis but only 31(17%) doctors knew cutaneous leishmaniasis may be cured even without treatment.

Although about three fourth (73.7%, n = 123) of the participants mentioned that leishmaniasis should be notified at first clinical suspicion, only 42.5% (n = 74) were aware that it is a legal requirement under the court of law in Sri Lanka. One hundred and fifty-two participants (84%) reported that all medical officers can notify the disease. Only forty-three (28.9%) medical officers knew the correct notification chain. Table 2 shows respondents attitudes regarding leishmaniasis and notification system. Participants were questioned about their involvement in notifying a suspected case of leishmaniasis and data are summarized in Table 3. Even though 58.0% (n = 105) of medical officers had suspected leishmaniasis during last eight years period only 19.4% (n = 35) had notified. Heavy workload (50.3%, n = 85), unavailability of notification forms (36.8%, n = 60), and inadequate supportive staff (35.1%, n = 55) were reported as barriers for timely notification. According to the responses given by sixty-six (36.5%) medical officers, notification forms were not available in their words at the time of this study. Majority of the participants (53.7%, N = 101) mentioned they would still notify over the phone to the relevant MOH in the absence of notification forms while some participants (28.7%, N = 54) preferred to wait till notification forms are available.

Table 2
Doctors' attitudes regarding leishmaniasis and notification system

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Attitudes about the disease.					
Leishmaniasis is an emerging disease in north central province	7(3.8%)	6(3.3%)	16(8.7%)	114(62.0%)	41(22.3%)
Early diagnosis and treatment is important in controlling Leishmaniasis.	10(5.5%)	09(4.9%)	01(0.5%)	99(54.1%)	64(35.0%)
Leishmaniasis can be eliminated from Sri Lanka.	10(5.5%)	17(9.3%)	35(19.1%)	95(51.9%)	26(14.2%)
Attitudes about notification					
Notification of Leishmaniasis is important.	12(6.6%)	1(0.5%)	4(2.2%)	76(41.5%)	90(49.2%)
All medical practitioners can notify diseases.	10(5.5%)	11(6.1%)	8(4.4%)	96(53.0%)	56(30.9%)
Current notification system is effective.	8(4.5%)	31(17.5%)	65(36.7%)	66(37.3%)	7(4.0%)
Barriers for timely notification are					
i) Unavailability of notification forms	19(11.7%)	52(31.9%)	32(19.6%)	53(32.5%)	7(4.3%)
ii) Heavy work load for medical officers	19(11.2%)	36(21.3%)	29(17.2%)	71(42.0%)	14(8.3%)
iii) Lack of staff to send the notification forms on time	19(12.1%)	55(35.0%)	28(17.8%)	45(28.7%)	10(6.4%)

Table 3
Doctors' practices on leishmaniasis notification

	Yes	No	Not relevant
Have you suspected Leishmaniasis in any patient during last 8 years?	105(58.0%)	68(37.6%)	8(4.4%)
Have you notified any Leishmaniasis cases	35(19.4%)	134(74.4%)	11(6.1%)
Do you have notification forms at your word/institute	98(54.1%)	66(36.5%)	17(9.4%)
Do you have notification forms at your private practice place/s	4(2.3%)	98(55.7%)	74(42.0%)
How will you notify in the absence of notification forms			
i) Do not notify	23(17.0%)	87(64.4%)	25(18.5%)
ii) Notify when notification forms are available	54(41.2%)	62(47.3%)	15(11.5%)
iii) Inform to the relevant MOH by a telephone call	101(67.3%)	37(24.7%)	12(8.0%)

Discussion

Leishmaniasis has now been identified as an emerging disease in Sri Lanka (11). Emphasizing the need for controlling this disease Ministry of health, Sri Lanka declared it as a notifiable disease in 2008 (5). This study was conducted in a sample of medical officers from a leishmaniasis high endemic district of Sri Lanka regarding their knowledge, attitudes and practices on leishmaniasis and its notification. To our knowledge, this is the first attempt to investigate this issue in the Sri Lankan doctors' community. According to our study, nearly 90% of physicians had good knowledge about the causative organism and disease transmission. Almost all the participants correctly identified the vector of Leishmaniasis as the sandfly. Most of the respondents knew about clinical features and treatment methods of Leishmaniasis. But only 17% were aware that cutaneous leishmaniasis can be cured even without treatment. The awareness was high regarding the most prevalent form of the disease as well.

Although most of the participants had the idea that Leishmaniasis is an emerging disease in the country; just above half of the sample knew that highest prevalence of the disease is from Anuradhapura district (the area in which they serve). This may be due to inadequate attention to publications of health ministry (weekly epidemiological reports) and annual health bulletins which are available online, that gives updates regarding disease prevalence. It would be beneficial to establish a network among medical officers of the country through text messages or e-mails to keep them updated regarding infectious disease outbreaks. Such a system can even be useful in crisis situations as well.

Lack of physicians' knowledge on Leishmaniasis can adversely affect the identification of patients, ordering diagnostic investigations and carrying out treatment plans. Inside the reticuloendothelial system of infected individuals, organisms multiply and liberate amastigotes into the blood. These amastigotes enter into sandfly's gut during a bite and multiply into promastigotes which can be transmitted into a new host (12). Thus, it is evident; delay in treatment aggravates the Leishmaniasis transmission. Doctors play a vital role in educating the public on health issues. If doctors' knowledge is deficient, public awareness inevitably becomes low. In the case of

Leishmaniasis, as the skin nodules are painless, poor public awareness increases the chance of late presentation to healthcare with complications.

According to the data gathered there was no consensus among doctors regarding the responsibility of filling the notification form and to whom a filled notification form should be handed over. Only one-third of medical officers who suspected leishmaniasis had notified. Notification and disease surveillance goes hand in hand. Notified data guides in distributing resources, monitoring and controlling the disease. Under notification and suboptimal attitudes regarding Leishmaniasis notification, can conceal the true disease burden and mislead the whole surveillance system. Notification switches on the contact tracing process and active case detection. Hence disease control is impossible to accomplish without proper notification.

The study confronted several limitations. Our sample size was small which can influence the external validity of the result. The possibility of over-reporting could not be excluded as there was no way of cross-checking what was reported is actually done. Despite all these limitations, we believe our findings provide a valuable source of information for the policymakers and future researchers.

Conclusion

Even though more than 90% of medical officers participated in this study had good theoretical knowledge about leishmaniasis, notification of leishmaniasis is considerably inadequate though the study population is from an area with high disease prevalence. Establishing an electronic system (Eg: e-mail) for disease notification will enhance timely notification of all notifiable diseases while making a path to overcome some of the barriers of inadequate human resources and infrastructure. Responsible officials and policymakers should take necessary actions to modify and improve the notification system to control and eliminate leishmaniasis from Sri Lanka.

Declarations

- Ethics approval and consent to participate: The study protocol was reviewed and approved by the ethics review committee of the faculty of Medicine and Allied Sciences, Rajarata University, Sri Lanka. All participant gave written consent for participation.
- Consent for publication: Not applicable.
- Availability of data and materials: The datasets used and analysed during the current study are available from the corresponding author on reasonable request.
- Competing interests: None
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- Authors' contributions: All authors contributed to designing the study and writing the proposal. CH, HSW, VT, TL, KP, RAS and SG collected the data. CH analysed the data and drafted the manuscript. All authors read and approved the final manuscript.
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