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## Cutaneous leishmaniasis in Sri Lanka: effect on quality of life

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### Abstract

**Background:** The quality of life in many patients is affected by skin lesions. Cutaneous leishmaniasis (CL), the commonest form of leishmaniasis is no exception. In Sri Lanka CL is an emerging parasitological condition with over 3000 cases within the last decade. Lesions are often seen on exposed parts of the body which may cause social stigma and hence a study was done to assess the changes in quality of life of CL patients.

**Method:** A total of 294 patients (200 civilians and 94 army personnel) answered a previously validated Sinhala self-administered Dermatology Life Quality Index (DLQI) questionnaire and an interviewer administered questionnaire.

**Results:** The majority of the civilian population 47% had no effect on their quality of life due to CL lesions, 33.5% were affected in a small way, 12.5% were affected moderately, 6.5% suffered in a large way and on 0.5% or one patient was extremely affected due a large ulcerative lesion being on the face. The effect on quality of life was negligible in the majority of army patients as well (35.1%-no effect, 31.9%-small effect), with a few patients affected moderately and very largely

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(22.3 % and 10.6%) respectively. The most affected domain in patients was symptoms and feeling  $1.27 \pm 1.400$  (mean $\pm$ SD) and the least was the relationships domain  $0.27 \pm 0.625$ .

**Conclusion:** CL does not seem to affect the quality of life in the majority of Sri Lankan patients as compared to CL in other parts of the world or other skin diseases.

## Introduction

Leishmaniasis is a group of diseases caused by a protozoan parasite, *Leishmania* and is transmitted by the bite of phlebotomine species of female sand flies. Cutaneous leishmaniasis (CL) is the commonest form of leishmaniasis and is endemic in over 80 countries.<sup>1</sup> CL produces an array of clinical features that range from papules to ulcers in exposed parts of the body that may heal with unsightly disfiguring scars.<sup>2</sup> Exact features of CL depends on the parasite species and the host immune status.<sup>3</sup> Studies done in the past have demonstrated the attitude towards CL lesions and the resultant scars as either sinister<sup>4</sup> or as just a part of life.<sup>5</sup> In Kabul Afghanistan girls with CL scars were considered unsuitable for marriage and women with active lesions were inhibited from doing their daily chores.<sup>6</sup>

In Sri Lanka CL is an established disease caused by *Leishmania donovani* MON –37.<sup>7</sup> The first CL case was reported in 1992.<sup>8</sup> There is a steady increase in incidence and spread of the disease. However, there is a dearth of data on the true impact of CL on quality of life of local patients. A preliminary study done in 2008 has described the impact of the disease as low to moderate in 86% of the patients. Furthermore, the Dermatology Life Quality Index (DLQI) questionnaire used at that time was the original English version verbally translated on site by a staff member instead of the validated Sinhala version used in this study.<sup>9,11</sup>

The DLQI is a standard internationally accepted measurement that assess the impact of skin diseases and its treatment on the lives of affected individuals, with, the use of a self – administered questionnaire that is designed to be used in adults (> 16 years of age). The study used the standard protocol prescribed for DLQI assessment to evaluate the impact of CL on the quality of life of patients.

## METHOD

### Study Area

This study was carried out in the dermatology clinic, Teaching Hospital Anuradhapura from March 2013 to August 2013 and from January 2014 to June 2014. Anuradhapura is a known endemic area for CL and the dermatology clinic in Teaching Hospital Anuradhapura is a regional center where patients are referred to as far as over 200km. Both military and civilian patients are seen in the hospital. Anuradhapura is an ancient city of historic relevance in the North Central province of Sri Lanka. The climate throughout the year is hot and humid with two monsoons occurring in March and November. There are many shrub jungles in the vicinity where the sand fly lurks.

## Case definition

Patients > 16 years with diagnosis of CL confirmed through microscopy and culture were included in the study.

## Study subjects

A total of 294 patients (Male:Female ratio of 223:71) were studied, that included 200 civilians and 94 army personnel. Most of the civilians contracted the disease from the same locality surrounded by shrub jungles while engaged in their routine outdoor activities and were very much a part of the general community. On the other hand the army population acquired the disease while they were on duty in areas close to the jungles of the North and East of the country and were referred via the army medical services to the Anuradhapura Teaching Hospital. They were secluded in army camps and messes, coming in to contact mainly with the fellow army personnel, except during holiday periods.

## Data collection

Informed consent was obtained from all the cases. Ethical clearance to carry out the study was obtained from the Ethics review committee, faculty of Medicine Colombo. The tool for data collection used was a self-administered Dermatology Life Quality Index (DLQI),<sup>10</sup> which has been previously validated in the local Sinhala language.<sup>11</sup> Demographic and clinical data were also collected using an interview schedule.

The DLQI consists of 10 questions covering 6 main domains. viz. symptoms and feelings: question 1 and 2, daily chores: question 3 and 4, leisure: question 5 and 6, work or study: question 7, personal relationship: 8 and 9, treatment : question 10. Each response was scored as 3=very much; a score of 2=a lot; a score of 1=little and 0=not at all, not relevant and unanswered. The DLQI is calculated by summing the score for each question with a maximum of 30 and a minimum of 0. Higher the score, greater the impairment of quality of life. The score range is divided into no effect and effects ranging from low, moderate, large and extremely large effect. The impact of disease on the quality of life is based on the score obtained and was classified as follows:- no effect-(DLQI score 0-1), low effect (DLQI score 2-5), moderate effect (DLQI score 6-10), very large effect (DLQI score 11-20) and extremely large effect (21-30).<sup>10</sup>

Data was analyzed using SPSS version 20.0 software. Quantitative variables were reported as mean  $\pm$  SD and qualitative variables as frequencies and percentages. The Mann - Whitney U-test was used to compare scores between two groups and the Kruskal -Wallis was applied to compare multiple groups. A value of  $P < 0.05$  was considered as statistically significant.

## Results

### Socio-demographic and clinical characteristics

The civilian and army populations were analyzed separately due to distinct difference between the two groups.

Out of the 200 civilian subjects the majority were males  $n=129(64.5\%)$ . Their ages ranged between 18- 86 years. All the patients seen were Sinhala in ethnicity except for one Tamil patient and two Sri Lankan moors. With regard to education, the majority had attained secondary education up to ordinary level or advanced level  $n=138(69\%)$ . Fifty eight percent ( $n=116$ ) were engaged in out-door related work (farming, civil defense, security officers, drivers and labourers), rest being traders, students, housewives or were unemployed at the time of study. The mean duration of disease at the time of presentation was  $7.29\pm6.732$ , (median = 5 months). Disease presentation was variable with most lesions being either papules  $n=55(27.5\%)$  or nodular-ulcers  $n=53(26.5\%)$  and the commonest site affected was the upper limb  $n=99 (49.5\%)$ . The majority of civilians  $n=104(52\%)$  have not heard about the disease leishmaniasis.

All 94 army patients were adult males, aged 21-40 years. The mean duration in time they presented with the lesions was  $6.46\pm5.426$ , (median= 5 months). Most of the lesions they presented with were nodular-ulcers  $n=31(33\%)$  and nodules  $n=26(27.8\%)$ . Majority of the lesions were found in the upper limbs  $n=58(61.7\%)$ . Most army patients  $n=69(73.4\%)$  were aware of the disease with respect to its name and mode of transmission.

### DLQI Response

The DLQI scores in the civilian population ranged from 0-30 (mean= $3.18\pm4.055$ ). Based on the obtained scores the disease had no effect on nearly half the population 47%, with majority of others indicating small effect 33.5% or moderate effect 12.5%. Only a minority felt that the impact of disease was large (6.5%) or extremely large (0.5%), (Fig. 1). Most prominent effect was in the 'symptoms and feelings' domain while the least effect was noted in the 'relationships' domain (Table 1). The DLQI scores for army patients ranged from 0 to 18 (mean  $4.32\pm4.537$ ). The effect of the disease on the quality of life was negligible in the majority (35.1% -no effect, 31.9% -small effect). Relatively less patients felt the impact of disease at a noticeable level (22.3%-moderate, 10.6%-very large), (Fig. 1). The most affected domain was the symptoms and feelings domain  $1.27\pm1.400$  (mean  $\pm$ SD) and the lowest effect was seen in the relationships domain  $0.27\pm0.625$  (Table 1).

Effect of the disease on quality of life did not vary between sexes or at different levels of education. Similarly no such effect was noted based on occupations, site of lesion, nor was it dependent on the level of knowledge about the disease. However, the type of lesion had a significant effect on the quality of life of patients ( $p=0.005$ ) with ulcers, plaques and nodular-ulcers affecting the quality of life more than nodules or papules ( Table 2). None of the variables studied had an impact on the DLQI scores of army personnel (Table 3).

### Discussion

Cutaneous leishmaniasis is not a life threatening condition and severe complications are infrequent but the lesions produced on exposed parts of the body leave permanent disfiguring unsightly scars that cause social stigma.<sup>12</sup> Disfigurement, stigmatization and changes in life style due to many skin diseases have been associated with psychiatric disorders such as depression, anxiety,<sup>13,14</sup> and lower quality of life.<sup>15</sup> CL is no exception with Yanik et al., reporting the quality of life of CL patients being significantly affected with

associated psychological problems in patients with active disease and those with scars (which may become permanent over time with poor response to treatment).<sup>16</sup> In this study we report a mean DLQI score of  $3.180 \pm 4.055$  among civilians with scores ranging from 0-30 and slightly higher mean DLQI score among army personnel of  $4.321 \pm 4.537$  with the range being 0-18. The difference in scores maybe because of the difference in life style of both groups. Army patients live away from home in messes with other fellow-men, which results in those affected by a skin disease especially in exposed parts of the body to be cornered and stigmatized. Civilians may have the support and comfort of family to dilute the negative effects of the lesions on their quality of life. However, personal relationships is very clearly shown for both groups as the least affected domain  $0.150 \pm 0.489$  and  $0.270 \pm 0.625$  for civilians and army respectively. In 2014 Ranawaka et al., published the mean DLQI score among army and civilians together being 6.09 in males and 4.28 in females. These scores were somewhat higher than observed in this study, the reasons could be many, including the period the changes in time which the previous study was carried out (2008), the disease was relatively 'new' and 'unknown' hence it may have caused more anxiety among the patients affected by it and hence score may have been higher.<sup>9</sup> The methodological differences between the two studies, with Ranawaka et al., using the English questionnaire, was verbally translated in to mother tongue by the interviewer may have also resulted in differences in findings. The effect of the disease on the quality of life of patients with CL has also been assessed in Iran and Brazil.<sup>17,18</sup> They were found to significantly affect the lives of patients. The results of the former studies cannot be generalized to our population due to socio – cultural differences. Lower scores in this study may also be due to the fact that the disease may have been presented in less severe forms as compared to other forms of cutaneous leishmaniasis studied and reported elsewhere since the clinical manifestations depend on species of parasite and host immunity.<sup>19</sup> There is an array of clinical presentations, ranging from being subclinical to clinical disease that can present with papules, nodules, ulcers, plaques or nodular ulcers that heal spontaneously or more frequently leave a unsightly permanent scars.<sup>2,20</sup> The disease is usually not too troublesome unless secondary infection sets in.<sup>21</sup>

In Sri Lanka CL is caused by *Leishmania donovani* MON 37 a parasite that usually causes the more severe visceral leishmaniasis.<sup>7</sup> In Iran the main CL causing species are zoonotic *L. major* and anthroponotic *L. tropica*. The lesions produced vary accordingly. The local species frequently causes nodular or nodulo-ulcerative lesions which are mostly single, localized and rarely form chronic ulcer.<sup>22</sup> *L. major* causes severely inflamed and ulcerated lesions that are usually multiple and get secondarily infected leaving large, disfiguring or disabling scars. *L. tropica* infection results in frequently multiple dry ulcers of the skin which often heals leaving disfiguring scars. This maybe one of the reasons for the DLQI scores being less in the local populations, though the disease affected 53% of the civilian population and 65% of the army to variable extents. There was a single civilian affected extremely by the disease, probably due to the nature of the lesion being an ulcer that affected the face. Disfigurement on the face has been shown to be associated with psychiatric symptoms and a lower quality of life.<sup>23</sup>

The differences in scores between the local population and other countries also may be explained by the fact that the causative organism is different. The *Leishmania* species varies

from region to region and it has the ability to produce distinctly different types of lesions, some more inflamed and ulcerated than others.<sup>20,24</sup> Socio-cultural differences may result in different scores as well.

Based on the scores of DLQI, the quality of life of patients either civilian or army did not differ significantly depending on the patients age, knowledge about disease, educational status, sex, occupation or site of lesion.

However, the type of lesion significantly affected the quality of life in civilians ( $p=0.0092$ ). This was in agreement with Yanik.<sup>16</sup> Those with papular lesions had a better quality of life than those with nodular-ulcers and ulcers most probably because they are smaller in size and are seen earlier during the disease process.

DLQI scores have been done in Sri Lanka for other diseases like lymphatic filariasis, which have been higher due to disability and limitation of physical activity with the mean DLQI score in chronic lymphedema being to be  $8.20 \pm 5.2$  SD.<sup>25</sup> Mean DLQI scores have been compared by eczema, psoriasis, acne and vitiligo (8.94, 10.54, 7.95 and 7.55 respectively).<sup>11</sup> These results show that overall, CL does not seem to have a drastic effect on the quality of life of those affected by this disease.

## Conclusion

This study reveals that the quality of life of CL patients is not so drastically affected, with majority of patients experiencing minimal effects. Further studies are needed to assess their quality of life after treatment.

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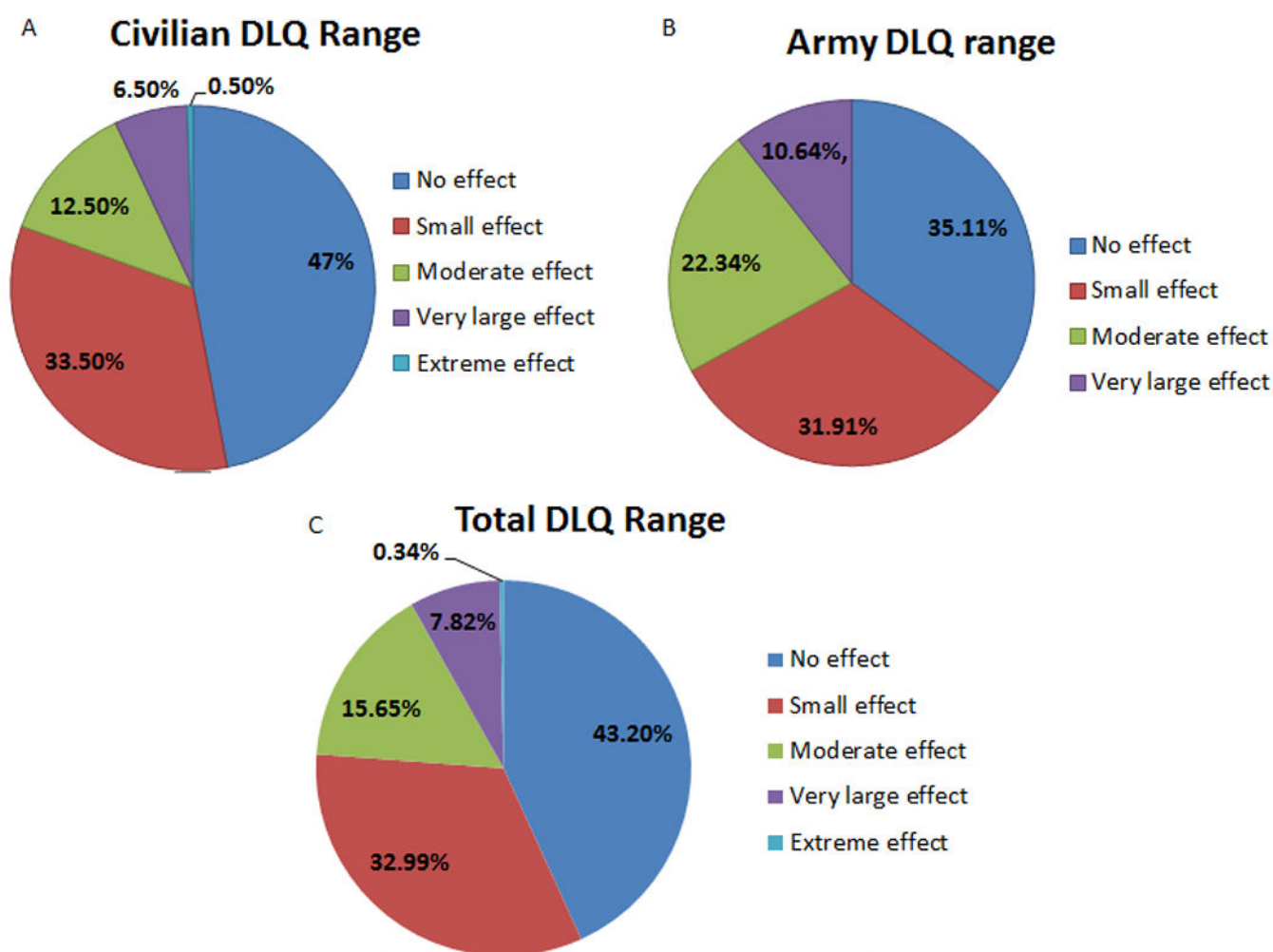
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**Figure 1.**  
Dermatology Life Quality Range (DLQ) in the civilian, army and total population



**Table 1**

DLQI scores in patients

<b>DLQI domains</b> <b>Overall score</b>	<b>Mean±SD</b> <b>Civilians</b> <b>3.18±4.055</b>	<b>Mean±SD</b> <b>Army</b> <b>4.32±4.537</b>	<b>Mean±SD</b> <b>Total</b> <b>3.54±4.241</b>
Symptoms and feelings	1.07±1.380 (0-6)	1.27±1.400 (0-6)	1.13±1.387 (0-6)
Daily activities	0.55±1.055 (0-6)	0.79±1.217 (0-6)	0.62±1.113 (0-6)
Leisure	0.20±0.521 (0-6)	0.44±0.887 (0-6)	0.26±0.668 (0-6)
Work and school	0.41±0.739 (0-3)	0.44±0.824 (0-3)	0.42±0.800 (0-3)
Personal relationships	0.15±0.489 (0-6)	0.27±0.625 (0-6)	0.19±0.538 (0-6)
Treatment	0.59±0.876 (0-3)	0.64±0.853 (0-3)	0.60±0.868 (0-3)

**Table 2**

Socio-demographic and disease characteristics of civilian patients and dermatology life quality index (DLQI) scores

Variables	Numbers and %	Mean DLQI score $\pm$ SD	P-value
<b>Sex-M</b>	129 (64.5)	3.23 $\pm$ 4.145	0.620 *
F	71(35.5)	3.08 $\pm$ 3.912	
<b>Education-Primary</b>	43 (21.5)	3.88 $\pm$ 4.333	0.212 **
Secondary	144 (72)	2.91 $\pm$ 4.014	
Post-secondary	13 (6.5)	3.85 $\pm$ 3.436	
<b>Occupation-Farming</b>	55 (27.5)	3.56 $\pm$ 5.613	0.853 **
Services	53 (26.5)	3.17 $\pm$ 3.390	
Housewife	37 (18.5)	3.46 $\pm$ 4.087	
Trading	12 (6)	3.33 $\pm$ 3.447	
Student	11 (5.5)	1.91 $\pm$ 1.375	
Labourer	08 (4)	3.63 $\pm$ 2.615	
Unemployed	24 (12)	2.25 $\pm$ 2.308	
<b>Lesion type-Papule</b>	56 (28)	2.57 $\pm$ 2.634	0.005 **
Nodule	49 (24.5)	2.49 $\pm$ 3.183	
Plaque	9 (4.5)	6.89 $\pm$ 9.062	
Ulcer	33 (16.5)	4.70 $\pm$ 4.149	
Nodular-ulcer	53 (26.5)	2.89 $\pm$ 4.268	
<b>Lesion site - Face, ears and neck</b>	33 (16.5)	4.27 $\pm$ 5.816	0.155 **
Arms and hands	101 (50.5)	2.87 $\pm$ 3.509	
Legs and feet	52 (26)	2.65 $\pm$ 3.105	
Trunk	14 (7)	4.79 $\pm$ 5.309	
<b>Knowledge about disease-Yes</b>	96 (48)	2.82 $\pm$ 3.118	0.563 *
No	104 (52)	3.54 $\pm$ 4.748	

SD=Standard deviation.

\*\*  
Kruskal Wallis test

\*  
Mann-Whitney U test

**Table 3**

Socio-demographic and disease characteristics of army CL patients and DLQI scores

Variables	Numbers and %	Mean DLQI score $\pm$ SD	P-value
<b>Education-</b> Primary	8 (8.5)	3.25 $\pm$ 4.301	0.397 **
Secondary	86(91.5)	4.42 $\pm$ 4.570	
Post-secondary	0		
<b>Lesion type-</b> Papule	16 (17)	3.44 $\pm$ 5.762	0.092 **
Nodule	26 (27.8)	3.00 $\pm$ 3.453	
Plaque	1 (1)		
Ulcer	20 (21.2)	5.25 $\pm$ 4.847	
Nodular-ulcer	31 (33)	5.35 $\pm$ 4.623	
<b>Lesion site -</b> Face, ears and neck	11(11.7)	5.91 $\pm$ 4.847	0.375 **
Arms and hands	58 (61.7)	4.24 $\pm$ 4.493	
Legs and feet	23 (24.5)	3.91 $\pm$ 4.660	
Trunk	2 (2.1)	2.50 $\pm$ 3.536	
<b>Knowledge about disease-Yes</b>	69 (73.4)	4.26 $\pm$ 4.331	0.809 *
No	25 (26.6)	4.84 $\pm$ 5.157	

SD=Standard deviation.

\*\*  
Kruskal Wallis test\*  
Mann-Whitney U test