

Body Locations of Leishmaniasis in the Targeted Population of Pakistan

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ABSTRACT

Background: Cutaneous leishmaniasis (CL), a skin infection caused by a sand fly bite, is most prevalent clinically in Pakistan. The initially caused nodules (bumps) may become ulcerated, have a long healing time, and may re-occur multiple times. This study identified the body areas most affected by Leishmaniasis in our target population.

Methods: This prospective study was conducted at the leishmaniasis clinic Institute of Skin Diseases Sindh Karachi (ISDSK), from July 2022 to June 2023. A standard questionnaire recorded demographics and site, location, and number of lesions. The diagnosis was confirmed by a Slit Skin smear showing Leishmania. The ANOVA was used to determine the mean difference between the variables and $p < 0.05$ was considered significant.

Results: Out of 138 patients, 87 (63%) were females and 51 (37%) males. The most common site of involvement was lower limb and feet at 44(32%) followed by face and neck at 37(27%), upper limb at 37(27%), and multiple sites at 20(14%). Majority of patients had single lesions 72(52%) followed by, two 34(25%), three 9(6%) and four or more in 23(14%). A comparison of lesions in gender, revealed, that males had 17(33%) on upper limbs, while females had 31(35%) on lower limbs. Comparing body locations province-wise, in Sindh predominant was lower limb 41(34%) whereas face in Balochistan 6(35%).

Conclusion: CL's most infected locations were face & neck and lower limbs of the body. Comparing gender, females were more affected. This is an increasing public health problem and requires attention of authorities, to fumigate the pandemic areas.

Keywords: Leishmaniasis, Cutaneous, Endemic

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INTRODUCTION

Cutaneous leishmaniasis (CL) is an infection of the skin caused by the biting of sand fly. It is a vector-borne zoonosis, with dogs, rodents, wolves, and foxes as common reservoir hosts and humans as incidental hosts^{1,2}. There are different types of Leishmaniasis caused by *Phlebotomus* or *Lutzomyia* species of the genus *Leishmania*, affecting different areas of the body, but in Pakistan CL is clinically the most prevalent manifestation. Leishmaniasis is endemic in several parts of the world, particularly in tropical countries. Asian populations commonly consist of persons of poor localities having sub-standard living styles. Such individuals are more susceptible to vector-borne infections. Initially caused nodules (bumps) may become ulcerated and take a long time to heal and may re-occur multiple times. These may be single or multiple and may be associated with systemic complications³.

CL is endemic in Pakistan and most affected are children both males and females, who get infected by playing with their peers. Exposed body parts such as the face, hands, and legs are targeted by vector⁴. Patients report in skin hospitals with a wide range of clinical manifestations and most frequently extensive skin ulceration⁵. The three clinical manifestations cutaneous leishmaniasis (CL), mucocutaneous leishmaniasis (ML), and visceral leishmaniasis (VL), are all caused by more than 20 well-known Leishmania species⁶. Over the past three decades, CL endemic areas in Afghanistan have moved to Pakistan, and outbreaks of CL have happened in refugee camps and among native Pakistani people close to related areas^{7,8}.

This is an increasing public health problem in our population and the cause and most vulnerable area of the body for the infection is required to be investigated. This study aimed to find out which areas of the body are most affected by Leishmaniasis in our target population.

METHODS

This prospective study was conducted at the leishmaniasis clinic Institute of Skin Diseases Sindh Karachi (ISDSK) which caters to patients from all provinces, mainly from Karachi, Balochistan, Sindh (interior), KPK, and Punjab. The patients were inducted from July 2022 to June 2023, after obtaining informed consent from each participant. After receiving approval from the Ethics Review Committee the samples were collected. A convenient sampling method was used. Demographic and baseline characteristics including name, gender, site of involvement, location of disease, and number of lesions were recorded on a prepared questionnaire. The diagnosis was confirmed by a Slit Skin smear showing Leishmania.

The analysis of data was performed using SPSS v. 28. All the quantitative variables of the study were calculated as mean and standard deviation (SD), and frequency and percentages were used for qualitative variables. The ANOVA was used to determine the mean difference between the variables. The $p < 0.05$ was considered statistically significant for all the values of the study data.

RESULTS

A total of 138 patients were included in the study. There was a slight preponderance of female gender 87 (63%) and male 51 (37%). Regional distribution showed that there were 120(87%) patients from the Province of Sindh, Followed by 17(12%) from Balochistan and 1(0.7%) from Punjab. The most common site of involvement was the lower limb along with feet 44(32%) followed by the face and neck 37(27%), upper limb 37(27%), and multiple site of involvement was seen in 20(14%). The Most common patients had single lesions in 72 (52%) followed by, two lesions in 34(25%), three lesions in 9(6%), and four or more lesions were found in 23(14%). (Table 1).

Table 1: Demographic characteristics of study participants with the distribution of lesions on the body

Variables n (%)				p-value
Gender				
Male		Female		0.98
51 (37)		87 (63)		
Region				
Sindh	Balochistan	Punjab		0.54
120 (87)	17 (12)	1 (0.7)		
Site of lesions				
Face + Neck	Upper Limb	Lower Limb	Multiple	0.09
37 (27)	37 (27)	44(32)	20 (14)	
Number of lesions				
1	2	3	≥4	0.36
72 (52)	34 (25)	9 (6)	23 (14)	

In comparison between males and females, upper limbs were commonly involved in males 17(33%), while lower limb was commonly involved in females 31(35%) with a p-value of 0.484.

While comparing the patients from different provinces we found that patients from Sindh had predomi-

nantly lower limb involvement 41(34%), from Balochistan face was the commonest site of involvement 6(35%), And from Punjab, only one patient showed involvement of the Lower limb. Though region-wise values looked remarkable the results were statistically not significant (P =0.412).

Table 2: Association of the site of lesions with gender and region

Variables		Site of Lesion				p-value
		Face + Neck n (%)	Upper Limb n (%)	Lower Limb n (%)	Multiple n (%)	
Gender	Male	13 (25)	17 (33)	13 (25)	8(16)	0.484
	Female	24 (28)	23 (23)	31 (35)	12 (14)	
Region	Sindh	31 (26)	32 (27)	41 (34)	16 (13)	0.412
	Balochistan	6 (35)	5(30)	2(12)	4 (23)	
	Punjab	0	0	1 (100)	0	



Figure 1: Clinical representation of Leishmaniasis in the face, lower limb, and upper limb.

DISCUSSION

The main finding of the site of involvement was the lower limb along with feet 44 (32%). The lesions in the lower limb have been reported to cause more problems compared to other areas because of pain and discomfort in mobility as well as difficulty in self-care and daily activities⁶.

The second most common site was the face and neck 37(27%), followed by the upper limb 37(27%), multiple sites of involvement were seen in 20(14%). The lesions on the other sites of the body, such as on the head or face, do not look as if they contribute toward negative or inhibited behavior among the social surroundings, however, people with multiple lesions avoid socializing⁶.

This shows the social and psychological impact of Cutaneous Leishmania can be damaging and can hamper the quality of life of patients due to disfigur-

ing scar formation and mutilation leading to social stigmatization^{4,7-10}. A higher frequency of facial CL lesions has been reported from the Middle East, which may be due to the local dressing of the population with only the uncovered parts, face, hands, and feet affected while most of the body including the limbs remain covered, and thus are protected from the vector of CL, the sand flies and hazardous chemicals¹¹⁻¹⁴.

There are more than 20 well-known *Leishmania* species that can infect humans and cause the three clinical forms of the disease, cutaneous leishmaniasis (CL), mucocutaneous leishmaniasis (ML), and visceral leishmaniasis (VL)⁶. CL endemic areas in Afghanistan have migrated to Pakistan over the past three decades, and outbreaks of CL have occurred in refugee camps and indigenous Pakistan populations near associated areas^{7,8}. Persons with active lesions suffer from severe stigma in Pakistan

due to the lack of information about the disease and its transmission 9,10. Cutaneous leishmaniasis is spread through bloodsucking sand flies (*Phlebotomus*), consisting of 37 species reported from Pakistan^{10, 15,16}. Algeria, Brazil, Iran, Syria, Afghanistan, Pakistan, Tunisia, and Peru are the countries with the most affected by this disease and the highest number of cases reported¹⁷⁻²¹. Prevalent data described its prevalence in sixteen developed and 72 developing countries (WHO, 2015), causing 0.1 million deaths every year¹⁷⁻¹⁸. In our study, there was a predominance of female patients which has also been reported by another study from Pakistan⁴. However, studies from Europe more men getting infected by CL, because of the association of CL with frequent visits to the interior (rain forest) for work or leisure-related reasons, with results showing 92,0% of male patients¹⁰.

In Pakistan¹¹, the reported prevalence rate is 60.5% in males and 39.5% in females from the North West Frontier Province (NWFP) which shows the disease is more prevalent in males than females. They also reported young individuals 1-15 years of age are more affected by this disease than older age group. In the present study, we observed 63% female and 37% male which shows the steadiness of vector-borne diseases in Pakistan. According to Ali et al,¹¹ 16 out of 207 cases 64% of males were found positive and significantly high prevalent than 36% of females. Furthermore, they reported most infected body parts, legs are found highly infected 45%, Face 26%, arms 20%, and 9% mixed body parts. In the present study, we found dominantly affected 32% of feet (Legs), Face and neck 27%, upper limbs 27%, and multiple site lesions 14%. The study suggests that CL diagnosed in endemic settings reduces the quality of life of patients²². Therefore, further work including different factors is required to examine and monitor the long-term impact of CL on patient life and to study the most effective therapies for better survival of patients.

CONCLUSION

Cutaneous Leishmania in our targeted area mostly infected the face neck and lower limbs of the body. Comparing the gender, females were found more affected. This is an increasing public health problem and requires the attention of authorities, to fumigate the pandemic areas.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

PATIENT CONSENT

Informed consent was taken from the patients.

AUTHORS CONTRIBUTION

All authors contributed equally to the study.

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