

# A Brief Review on Infestation of Cutaneous Leishmaniasis in Pakistan

Naseer Ullah<sup>1</sup>, Muzafar Shah<sup>1\*</sup> and Mian Sayed Khan<sup>2</sup>

<sup>1</sup>Centre for Animal Sciences and Fisheries, University of Swat, Pakistan

<sup>2</sup>Department of Zoology, University of Swabi, Pakistan

\*Corresponding author: Muzafar Shah, Centre for Animal Sciences and Fisheries, University of Swat, Pakistan



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## ABSTRACT

Cutaneous leishmaniasis frequently including only the skin and one and more than one lesions are present on the skin depending on the species of *Leishmania*, smooth ulcers, flat plaques, nodules or hyperkeratosis wart like ulcers may be observed. The causative agent of cutaneous leishmaniasis is *L. tropica* which is spreading by *Phlebotomus sergenti*, *P. papatasi*, *P. caucasicus*, *P. longipes* and *P. pedifer* in the endemic areas. According to WHO, annually 0.4 million new cases of leishmaniasis occur per year, approximately with almost 400 million people at threat of the disease. The infection is commonly present along the entire Western border of Pakistan. Sindh (area associated with Balochistan), Punjab (Multan and Chakwal) and Northern Areas of Balochistan. In Pakistan, the status of leishmaniasis has been changed. In parts of the country both the cutaneous and the visceral types of the disease are being noticed from various parts of the country, including Khyber Pakhtoonkhwa. This article focus on the burden of CL in different areas of Pakistan.

## Introduction

Leishmaniasis is a vector transmitted disease caused by more than 25 obligatory intracellular protozoans belonging to *Leishmania*; a genus of flagellate protozoa (order: Kinetoplastida, suborder: Trypanosomatidae) are parasites with worldwide distribution, several species of which are pathogenic for humans Barral [1]. Leishmaniasis is caused by a compound of species and subspecies of leishmania. There are numerous species reported from South America including *Leishmania lainsoni*, *L. naifli* and *L. shawi* that contaminate humans and *L. enriettii*, *L. hertigi*, *L. deanei* and *L. aristidesi* that are found only in wild animals. In the Old World, the main causative agents of cutaneous leishmaniasis are *L. tropica* and *L. maior* and visceral leishmaniasis is caused by *L. donovani*. Visceral leishmaniasis is caused by *L. chagasi* in the New World and *L. braziliensis*, *L. Mexicana* and *L. peruviana* cause cutaneous and mucocutaneous leishmaniasis. Instead of humans from other organism a *Leishmania* species have been also isolated Cox [2]. The causative agent of cutaneous leishmaniasis is *L. tropica* which is spreading by *Phlebotomus sergenti*, *P. papatasi*, *P. caucasicus*, *P. longipes* and *P. pedifer* in the endemic areas. The sand

flies are obligatory vectors and insect hosts of *Leishmania* species Cotran *et al*, [3].

More than 80 countries of the World cutaneous leishmaniasis (CL) are found. Yearly frequency of 1.5 million cases per year reported by WHO Sharma, *et al*. [4]. Out of 350 million people, it is projected that 12 million people are infected from a population who are at risk Sharma, *et al*. [4]. Most cases of CL are present in Saudi Arabia, Afghanistan, Syria, the Americas and Iran. In Pakistan the case of both cutaneous and visceral leishmaniasis are found. 2.7% prevalence rate has been reported from the Northwestern region of the country. Occurrence in Pakistan has been anticipated at 4.6 cases/1000 persons/per annum from the last ten years Kolaczinski, *et al*. [5]. The parasites of leishmaniasis are found in all over the World except Antarctica and Australia Magill [6]. The infection is commonly present along the entire Western border of Pakistan. Sindh (area associated with Balochistan), Punjab (Multan and Chakwal) and Northern Areas of Balochistan Ahmad, *et al*. [7]. In Pakistan two species of Old World CL are endemic to Pakistan. *Leishmania major* cause ZCL or Rural or Wet, is associated with

bites of *P. papatasi* and present in rural areas of Pakistan Faulde, et al. [8]. Zoonotic cutaneous leishmaniasis is endemic to the Southwest, mainly occurring in Balochistan, neighbouring Punjab and Sindh provinces Burney [9]. Dry type leishmaniasis has a widest distribution, occurring in urban areas of Southern Punjab (Multan) and Balochistan (Quetta) but also focally in the Azad Kashmir and Northern Areas Khan [10].

In Pakistan, the status of leishmaniasis has been changed. In parts of the country both the cutaneous and the visceral types of the disease are being noticed from various parts of the country, including Khyber Pakhtoonkhwa Khan [11]. A study was conducted on CL by Ullah, et al. [12] in Dir Upper. The samples were collected from infected Afghan refugees of different areas of Dir Upper. Total 274 samples were collected among which 169 (62%) were positive cases. Total 112 (66%) males and 57 (34%) females were affected. The high prevalence rate (49.7%) was noticed in the age of 11-20 years old peoples. The prevalence rate between the age of 0-10 was 29.1%. The low prevalence rate (13.6%) was noticed in the peoples over 30 year. Mostly one lesion was noticed in an effected people (69%). The patients with two lesions were 22%. The numbers of effected persons with more than two active lesions were little in number i. e. 9%. Most of the lesions were reported on face (36.4%). The second effected part of body noticed in the study was hand (26.5%). Most of the lesions were dry (81%). The survey of Durrani, et al. [13] shows that both dry and muco-purulent cutaneous forms of the disease were found to be endemic in the North, South and West of Pakistan. The East and Southeastern regions were non endemic. No case of visceral form of disease was encountered during the period of study from any part of the country.

In Northern Pakistan the disease was most prevalent in humans in November 2007 (661) and least prevalence rate was noticed in February, 2008 (292), while in dogs the highest prevalence was during November, 2007 (24%) and lowest prevalence in January, 2008 (5%). In Southern Pakistan the highest human disease prevalence was observed in April, 2008 (518 cases) and lowest disease prevalence was noticed in June, 2007 with 308 cases. A research was carried out on CL in Peshawar by Nawaz, et al. [14]. In the survey out of 229 peoples 19 were Afghan refugees and 276 were from local population in 16 (5.79%) were positive for CL. High prevalence rate (10.9%) was noticed in the age of 0-9, followed by the age group 10-19 (6.66%). Face was highly infected. In majority of cases (9.5%) one lesion were noticed while 5.62% had 2 to 3 lesions, 5% had 4 to 5 lesions and 4% had more than 5 lesions. A survey was conducted by Khan *et al.* (2009) on CL in Peshawar. Total 223 cases were positive out of 320 enrolled patients. Local population (73.06%) was highly effected than Afghan refugees (58.66%). High amount of infection rate were noticed in the age of 0-9 and the lowest rate of infection were reported in adults. Males (76.47%) are highly infected than females (57.75%).

The research was carried out on the prevalence of cutaneous leishmaniasis in Lower Dir District (KP), Pakistan by Khan [10]. Out of 224, 114 (51%) cases were positive for CL. Out of 224 participated individuals, the numbers of local population were 129 and 95 were from Afghan refugees. The rate of infection in local population was 55% and in Afghan refugees 45% individuals were infected. Mainly single lesions (56.7%) were present among the infected peoples. In 34.2% of patients the lesions were present on face. 57.2% had several ulcers on different parts of the body such as face arms, face legs, arm leg etc. in most cases (81.3%) wet lesions were reported and dry type of lesions were present in 18.7% cases. Imran [15] conducted a research on CL in Sibi among the troops and their families. Total 293 cases were noticed as positive for CL in which 96.6% were males and 3.4% were females. From one to four the numbers of lesions were noticed. Most of the lesions were wet. 1640 cases were reported by Bhutto [16] from Chandka Medical College, Larkana. The lesions were classified as wet, dry nodular and crusted clinically. A study was carried out on CL by Ejaz, et al. [17] in Somniani. Total 108 cases were observed in the study time. Most of the cases were noticed in 2004 (58). A survey was conducted by Shoaib, et al. [18] on CL in childhood at Karachi. Total 400 cases were recorded as positive for CL. The infection rate was high in the age of 14 (46.25%). Males (118) were highly effected than females (67).

The cases belonged to various area 40.5% patients belong to Sindh, in which 17 (22.6%) were residents of Karachi who did not give history of visit to any prevalent area. In the remaining cases 28% were from Balochistan, 10% from Punjab and 38 from KP. Two hundred cases of CL were confirmed by Wakil, et al. [19] during 2001-2004. The infection was reported at Dadu Distt: Hospital and local NGOs. Kakarsulemankhel [20] reported two types of CL, ZCL and ACL found to overcome in Balochistan Khan [21]. Khan [22] conducted a study on CL in Hospitals at Peshawar during January to May, 2002 and recorded that CL is a rising health problem of the country. 16 patients were reported positive for CL out of 167 male patients and 6 female cases were positive among 139 female individuals. 236 cases were detected by Kolachi, et al. [23] in Taluka Juhi, district Dadu. Total 108 cases were determined as CL. Children and women were highly effected. Kakarsulemankhel [24] conducted a survey on CL in Balochistan, in 1996-2001, established the occurrence of CL in 8 formerly recorded (old) foci of CL and 31 new foci were also reported. Total 50.5% cases had active lesions and 47.5% had scars out of 15847 inhabitants. Most of the infection (45.6%) was noticed in children of the age group of 5-10 years.

Brooker, et al. [25] studied the Epidemiology of CL in Pakistani border regions with Afghanistan. 16 Afghan refugees were observed as positive for CL by Kolaczinski [5] during November to December, 1998 in Khyber Pakhtoonkhwa. In total positive cases 2.7% had active lesions and 2.4% had scars. It was revealed that risk of active ACL was connected neither with age nor with gender. Soomro, et

al. [26] recognized 200 cases of CL at village Larkana district and GhaibiDero, Sindh during one year of study. The rate of infection of male to female was 3:1. 58 cases were recorded as positive for CL among the army and employee working with them in Kohat by Rahim, et al. [27]. 30 confirmed cases were also reported from Nishtar Hospital, Multan by Ayub, et al. [28] during December 1999 to March 2000. Most of the patients (86%) were in the age of 11-20 year. Males (77%) were highly effected than females. 478 cases were reported by Soomro, et al. [29] in Chandka Medical College Hospital, Larkana during February to July, 2001. Children are highly effected (68%) as contrasted to adult. Most of the cases open ulcers (77%) were found followed by nodular plaque and popular type of lesions. Hamid [30] conformed 57 cases out of 1370 observed individuals in Waziristan agency.

From a village of Sono Khan Chandio of Larkana district, Sindh, first CL cases were noticed by Pathan [31]. Total 115 cases were positive for CL, out of 130. Bhutto *et al.* (2001) noticed numerous numbers of cases of CL in Shahdad Kot, Jacobabad, Miro Khan, Qambar Ali Khan, Larkana, Dadu and Warah area of Sindh province. In the earlier period 4 years, from Sindh Province occurrences of CL have been reported. Cutaneous leishmaniasis was reported in Afghan refugees at Timergara, Khyber Pakhtoonkhawa by Rowland, et al. [32] and suggested that CL is caused by *L. tropica*. Between August 1994 and July 1995, 11517 primary school children aged 6-11 years in the south eastern Iranian city of Bam, containing 5957 (51.7%) boys and 5560 (48.3%) girls, were observed for the presence of active ulcers or scars of cutaneous leishmaniasis (CL) by Sharifi, et al. [33]. There was a tendency towards increasing incidence with age, the incidence being 10.7% in 6 year old and 20% in 11 year old children. Total 1.3% of the children with active lesions and 14.3% with scars. There was no significant difference between the sexes in the incidence of active lesions and/or scars. Of the children examined, 54 (0.5%) had *Leishmaniasis recidivans*: 19 girls (35.2%) and 35 boys (64.8%). The numbers of active lesions and scars per child ranged from 1 to 10. Most of the cases (82.3%) had one lesion; with two lesions patients were 12.4% and 5.3% had 3 lesions. The face was the most effected part of the body (63.6%), followed by the hands (20.9%), legs (12.8%) and other parts of the body were 2.7% affected.

Most of the cases (92.9%) were infected by *Leishmania tropica* and only 7.1% cases were infected by *L. major*.

50 cases were reported by Iqbal [34] in Army soldiers, with CL lesions during an investigation conducted during 1995-1996 by a joint team of Armed Forces Medical College and Defense Science and Technology Organization in Balochistan Province. Total 305 cases of CL were reported by Mujtaba [35] in Nishtar Medical College Multan during 1995-97. Only dry types of lesions were noticed. All of the patients were infected by *L. tropica*. Out of 120, 90 cases reported as positive for CL in the study of Nawab, et al. [36] diagnosed in Dr. Ihsanullah's Lab., Karachi. Cutaneous leishmaniasis

cases were observed by Ahmad (1988) in southern Balochistan and its association as a zoonosis. Ghazi [37] reported the CL from Uthal. Rab, et al. [38] conducted a survey on CL in Lasbella, Uthal and Balochistan. 418 school children were diagnosed of 5-15 years of age in the study, in which 1.1% had active lesions and 26.5% had scars. 100 cases were diagnosed by Jan (1984) of CL. In which, 45 were Afghan refugees, 20 from Lasbella, 15 from Duki, 12 from Kohlu and 8 from Lehri; most of the cases (75%) were under the age of 14 years. Males were infected in high amount than females. Most of the cases were observed with the presence of two lesions. Khan [39] conducted a beginning survey for CL in 1979 and reported that cutaneous leishmaniasis is uncommon in Quetta, Balochistan.

4.9% cases were reported from District Hospital in Sibi. Cutaneous leishmaniasis was established prevalent in DeraBugti, Lehri, Sangsela, Kahan, Mewand, Kohlu, Bibertak, Gumbz and Barkhan. 2500 cases of CL was confirmed by Malik, et al. [40,41] in the out-door department of Nashtar Hospital, Multan.

## Conclusion

From the article it is revealed that CL is present in most of the areas of Pakistan. The most infected areas of Pakistan are present in Baluchistan and Khyber Pukhtoonkhwa. Those areas are very infected where Afghan refugees are present. It is concluded that the CL is a very sever threat for the public health of Pakistan.

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