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PREVALENCE OF CUTANEOUS LEISHMANIOSIS IN DISTRICT SHANGLA, KPK, PAKISTAN

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Abstract

Cutaneous Leishmaniasis (CL) is a neglected vector-borne tropical skin disease that mostly affects impoverished areas. It is endemic to Pakistan and one of the main vector-borne illnesses. Depending upon the species of Leishmania, different ulcers may be seen in cases of cutaneous leishmaniasis, which constantly affects only the skin. L. Tropica, which is responsible for cutaneous leishmaniasis, is spreading by different species of sand fly. The disease is frequently seen in Shangla as well as in whole Pakistan. The situation with leishmaniasis has altered in Pakistan. Both the cutaneous and visceral forms of the complaint are being reported from different regions of the nation, including KPK. This study concentrated on the prevalence of cutaneous leishmaniasis in five tehsil of Shangla district, was conducted between September 2021 and April 2022. Skin lesions were used to identify positive cases after suspects were examined for the disease. Samples were taken from the effected parts and fixed with giemsa stain so that their smear could be seen.

This study aims to determine the prevalence and demographic distribution of cutaneous leishmaniasis in Shangla, Pakistan.

INTRODUCTION

Cutaneous leishmaniosis is spread through the biting of female sand flies of the genus Phlebotomus. Sand flies are the primary vectors, with females' sand flies requiring a blood meal for eggs production, thereby transmit the Leishmenia parasite. Adult sand flies are tropical hematophages and carry a parasite protozoon through a bite (Vincent & Cardé 2009). The medical symptoms of cutaneous leishmaniasis (CL) can vary considerably, with Leishmania tropica and Leishmania major being the most frequently defined species that lead to the soft ulcers, smooth blisters, masses, and eruptions you describe. The physical morphology typically depends on the sort of parasitic organism and the way the immune system reacts to it. Leishmenia major is the predominant cause of CL in humans across the Subcontinent, Eurasia, the Middle East, and Africa. WHO recorded 1.5 million cases annually and out of 350 million people; 12 million are anticipated to have the disease (Sharma, et al., 2003). Cutaneous Leishmeniasis is endemic in over 90 countries (WHO 2017). The World Health Organization estimating 0.7million to 1.2 million cases annually (Vélez et al., 2009). The present study objective is to document the widespread incidence of skin leishmaniasis and its treatment in various parts of Shangla, a mountainous region of KPK.

Pakistan is one of the high burden country with frequent reports from KPK, Balochistan and Sindh provinces (Shaikh, et al 2025). Despite all these evidences, there is lack of updated research

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specific on cutaneous Leishmenia in district Shangla. This study was therefore, conducted to document the epidemiological features of cutaneous leishmania in district Shangla to aid in local control strategies.

Methods

Study area

A cross-sectional study was conducted from September 2022 to April 2025 at the department of pathology and skin at DHQ hospital Alpuri Shangla, to gather data on the prevalence of cutaneous leishmaniasis and its therapeutic interventions. With an estimated population of roughly one million, the district is administratively divided into five tehsils; Alpuri, Puran, Besham, Martung and Chakisar. Hilly terrain and mountains encircle the region. M.S DHQ Hospital Alpuri all gave their ethical approval for the study. Clinical examinations were performed on suspected patients who were frequent visitors to the DHQ hospital and had severe sores. A total of 103 suspected patients with skin lesions were examined and the diagnoses were confirmed by microscopy of Giemsa stain smears, prepared from lesions aspirates. The patient's name, father's name, sex, age, occupation, location, number of lesions, date of onset of initial symptoms, medical history, address, ethnicity, treatment, and earlier diagnoses through microscopic examination and/or biopsy were recorded in a pre-established form.

A personal conversation with the patient helped us discover about multiple variables. A mobile phone's digital camera was used to take pictures of the lesion.

Statistic Evaluation

The statistical analysis was accomplished using the Microsoft Office Excel and using the Student test for significant differences. For differences between males and females, as well as across age groups, infected body parts, and geographic regions, $p < 0.05$ was established as important criteria.

Samples Collection

Specimen of skin lesions from different places on the body that showed signs of infection was collected. The body's lesions were washed and disinfected with 100% ethanol. The sores were pierced with a lancet using the thumb and first finger. After 30 minutes of fixing with 100% methanol, thick and thin smears were prepared for observation. Each time, a colored pencil was used to properly number the slides.

Microscopy and Staining Based Identification

A confirmation of cutaneous leishmaniasis can be determined by direct observation of the parasite in oil impression smears under 100x microscopes and by staining skin biopsies with Giemsa dye (Sundar and Benjamin, 2003). In a staining jar, dry, thin fixed slides of patient's skin lesions were stained with working Giemsa stain for 30 minutes. After staining, the slides were cleaned with water and left to air dry.

Results

This study was designed to find out the incidence of cutaneous leishmaniasis across 103 individuals in Shangla district. Out of the 103 cases included; 89 of them (87.26%) had cutaneous leishmaniasis. Majority of patients were males 58.26% (n=58). The female ratio is 41.74% (n = 43). The highest infection rate was in 21-40 years age group and face was the most common infection site. The Karora reported the highest number of cases. They ranged in age from 0 to 70 years old (0 being the day of birth to 1 year).

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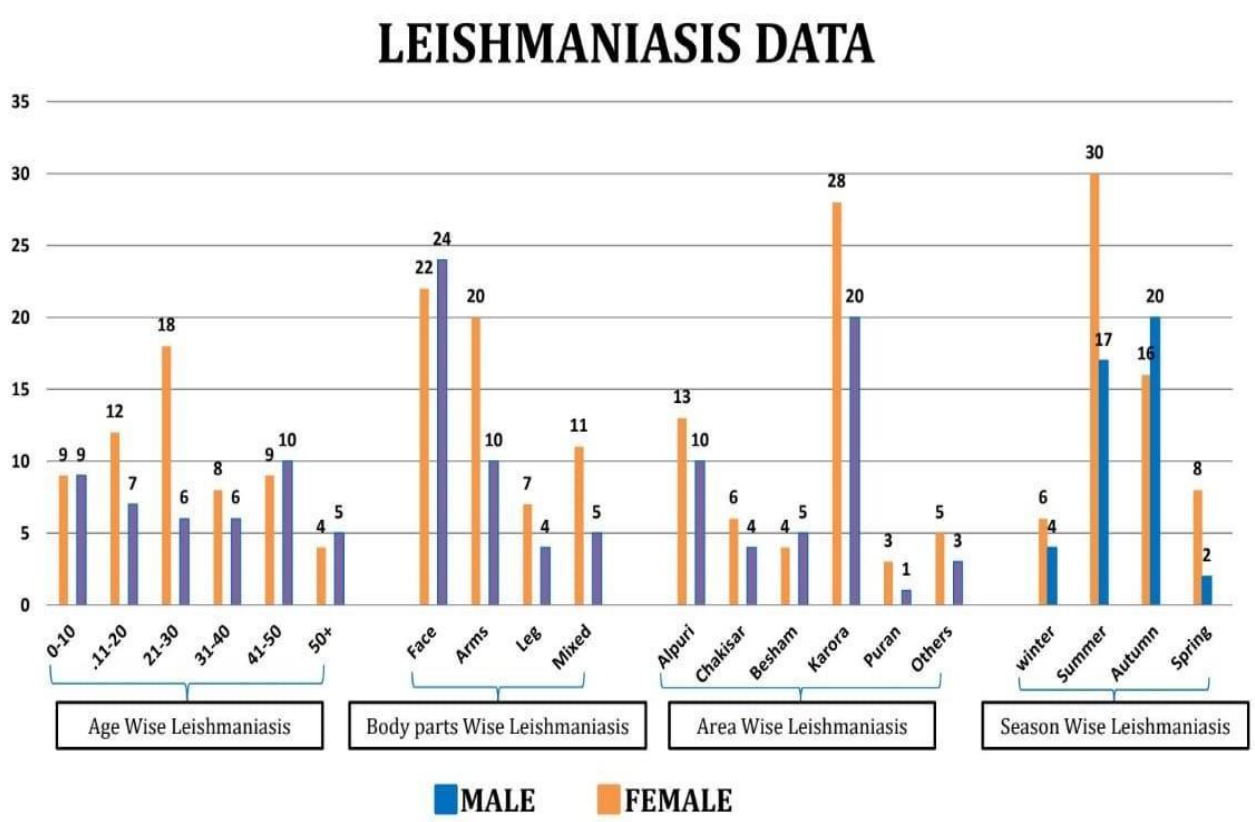

Fig 1. Percentage of Leishmaniasis according to age, area, body parts and season

Both sexes' exposed parts of the bodies have been shown to be highly infected. The body areas that have the highest percentage of infections were the face (21.29% male + 23.81% female), arms (19.60% male + 9.80% female), legs (6.86% male, +3.92% female), and mixed body parts (10.78% male + 4.90% female). Regarding the prevalence of cutaneous leishmaniasis by area, samples from Karora area exhibited a high rate of infection (27.45% male + 19.60% female), followed by Alpuri region. According to the statistical data, there is a substantial gender difference between males and females; males have a much higher prevalence of infection ($p<0.05$) than females. The age groups of 0 to 10, 11 to 20, 41 to 50, and 50+ old did not differ significantly ($p>0.05$), however the age group of 21 to 40 years old did differ dramatically ($p<0.05$).

Male and female body parts (face, legs, and mixed) are mostly the same, although males have significantly infected more on the arms than females ($p<0.05$). In Alpuri cutaneous leishmaniasis have up to 22% rate of the ailment in both sexes. Similarly, in Besham and Puran areas we see significant rate of disease. The reason for high incidence rate in Karora is its lower altitude, water dam, more vegetation, humid condition, agriculture and poor housing condition. Peak level of infection is seen in summer and autumn seasons which needs public health intervention.

Most of the infections were seen on the body areas that were exposed as shown in figure 2. Additionally, the infection was more frequent in younger adults than in children and the elders. (Table 1, Figure 1 and 2). All patients were treated in dermatology department with intralesional pentavalent antimony i.e. megluine antimoniate weekly for five weeks with excellent outcome.

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Table 1. Leishmaniasis in Gender, Body parts, Age and Area wise in Shangla.

LEISHMANIASIS DATA					
Leishmaniasis in both genders					
Gender	Male	Female	Total	Male Percent	Female Percent
No of Patient	60	43	103	58.26	41.74
Leishmaniasis/age of patients					
Age	Male	Female	Total	Male Percent	Female Percent
0-10	9	9	18	8.82	8.82
11-20	12	7	19	11.76	6.86
21-30	18	6	24	18.68	5.88
31-40	8	6	15	7.84	5.88
41-50	9	10	19	9.80	3.92
50+	4	5	9	3.92	4.90
Leishmaniasis/body parts of patients					
Body Parts	Male	Female	Total	Male Percent	Female Percent
Face	22	24	46	21.56	23.52
Arms	20	10	21	19.60	9.80
Leg	7	4	11	6.86	3.92
Mixed	11	5	16	10.78	4.90
Leishmaniasis/ different regions					
Area	Male	Female	Total	Male Percent	Female Percent
Alpuri	13	10	23	12.74	9.80
Chakisar	6	4	10	5.88	3.92
Besham	4	5	9	3.92	4.90
Karora	28	20	48	27.45	19.60
Puran	3	1	4	2.94	1
Others	5	3	8	4.96	2.94
Leishmaniasis/season					
Season	Male	Female	Total	Male Percent	Female Percent
winter	6	4	7	5.88	3.92
Summer	30	17	42	29.41	16.66
Autumn	16	20	39	15.68	19.60
Spring	8	2	3	7.84	1.96
	Results				
	Positive cases	Negative cases	Total cases	Positive cases percent	Negative cases Percent
	89	14	102	87.27	13.73

Values are significantly different ($p<0.05$) from each other.

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Discussion

This study confirms a high prevalence rate of cutaneous Leishmeniasis among the suspected cases visiting at DHQ Shangla with significant variation by age, gender, and geographical location. The majority of Asian communities are composed of individuals who hail from underprivileged areas that lead subpar lives. Many individuals are more likely to contact illnesses transmitted by insects. The literature cites considerable research on leishmaniasis conducted in Pakistan between 2003 and 2025.

Ullah et al, 2009, revealed that the North West Frontier Province (NWFP) had more cases of cutaneous leishmaniasis in people aged 1 to 15 than in older adults. In a similar way, they stated that men are more likely exposed than women to have the illness (60.5% versus 39.5%). This data is consistent with the current study because we found that, out of the 103 examined cases, 42% were female and 58% were male. This gender gap may result from women being restricted within their homes while men generally communicate with the outside world to carry out their work and economic responsibilities.

Another study conducted by (Ayaz et al., 2018) examined cases of cutaneous leishmaniasis in Multan, a city in Punjab province, and found that it is a neglected tropical disease. They reported 198 individuals with cutaneous leishmaniasis, ages ranging from 10 to 40, 101 of whom were male and 97 of whom were female. In this investigation, more cases were observed between the ages of 21 and 40, identified as having skin lesions associated with cutaneous leishmaniasis. The varied conditions in the two regions could explain the minor variation in age and gender distribution.

In Lower Dir, Pakistan, another study by (Rahman and Rehman, 2018) found an important variation between the prevalence of cutaneous leishmaniasis in males and females. Only 16.1% of females have an infection as a major skin problem, compared to 24.5% of males. Nonetheless, another investigation by (Bhutto et al., 2009) suggested a minor distinction between cases in men and women. After evaluation, they discovered that the provinces of Sindh and Baluchistan are primarily impacted by this illness. They claim that an overwhelming number of cases originate in the province of Sindh. The diagnostic process, which involved looking at skin lesions and performing a smear test, was the same as the one adopted in the current study.

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Fig 2. Cutaneous leishmaniasis scars on infected sites: 1. Arm 2. Hand 3.Nose. 4. Face 5. Leg

In light of the literature, leishmaniasis is clearly one of the most common skin conditions in the Pakistan. It is rapidly and extensively spreading. Shangla is constantly the target of leishmaniasis. According to a survey conducted by (Asghar et al., 2021), in Shangla, gathered information from 236 total samples, and found the infection was higher in males compared to females. A valid laboratory investigation was necessary to collect data on the basis of giemsa staining microscopy from patient's scars to confirm the disease and see their response to treatment. Since there are a lot of adult flies on their breeding grounds throughout the summer season, it is advised to control its vector by applying certain unconventional pesticides and forbade the young adults from swimming in rivers.

Limitations:

This study has a limitation as this is hospital base and not community base, may be more cases are present. Due to a shortage of time no survey was made to look for the disease.

Conclusion

Cutaneous Leishmeniasis is highly prevalent in Shangla particularly among the young adult males, significant variations across different regions. These findings highlight the need for targeted vector control and population awareness programs.

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