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FREQUENCY OF CUTANEOUS LEISHMANIASIS IN CHILDREN BELOW AGE FIFTEEN OF DISTRICT BAJAUR, KP, PAKISTAN

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Abstract

Cutaneous leishmaniasis is the most common form of leishmaniasis, causes skin lesions, mainly ulcers on exposed parts of the body, leaving lifelong scars and serious stigma. Approximately 95% of cutaneous leishmaniasis cases occur in the Americas, Mediterranean, Middle East, and Asia. Bajaur, a district in the Malakand division of Khyber Pakhtunkhwa (KP), is endemic for cutaneous leishmaniasis. The objective of this study was to determine the frequency of cutaneous leishmaniasis in suspected children below the age of fifteen in District Bajaur. The study also aimed to identify the tehsil-wise and gender-wise frequency of cutaneous leishmaniasis in the seven tehsils of District Bajaur. This descriptive cross-sectional study was conducted from June 2022 to August 2022 at the Leishmaniasis Center of District Headquarters Hospital Khar, Bajaur, KP, Pakistan. The study included 150 samples, each from individuals with one or more lesions on their skin, collected from seven tehsils of District Bajaur. The total samples were grouped into three age groups, with the highest positivity (80%) in the age group of 5-10 years. Of the 86 suspected male patients, 65% tested positive, while 64 suspected female patients had 45 positives for leishmania. In conclusion, the frequency of cutaneous leishmaniasis is high among the local population of District Bajaur. The results showed that 73.33% (110/150) of the suspected patients tested positive for amastigotes, and 26.66% (40/150) tested negative. No significant differences in positivity between males and females were recorded. The most frequent site of the lesion was the face, and the most affected age group was 5-10 years

Keywords: Cutaneous Leishmaniasis, lesions, skin, endemic, Bajaur.

1. INTRODUCTION

Leishmaniasis is a prominent neglected infectious disease caused by parasitic protozoa from the genus Leishmania, transmitted to mammalian hosts by female phlebotomine sand flies (Giraud et al., 2019; Georgiadou et al., 2015). This ancient malady, initially reported by Leishman and Donovan in 1903 (B. Herwaldt , 1990), has seen various clinical variants, including paranychial, chancriform, annular, palmoplantar, zosteriform, and erysipleoid forms, making diagnosis challenging (Savoia et al., 2015). Carini identified Leishmania in mucosal lesions in Brazil in 1912, and Bramachari described Post Kala-azar dermal leishmaniasis (PKDL) in India in 1922. Cutaneous

lesions typically manifest as single ulcers resulting from multiple sand fly bites, and 20 different sand fly species can cause human infection.

The World Health Organization (WHO) reports 0.7 to 3 million new leishmaniasis cases annually, causing 20,000 to 30,000 deaths, with 90% of cases concentrated in Ethiopia, Brazil, India, Somalia, South Sudan, and Sudan (WHO, 2018). Cutaneous leishmaniasis (CL) is the most prevalent form, characterized by skin ulcers and lasting scars, while mucocutaneous leishmaniasis (MCL) causes nasopharyngeal mucosal infection. The disease is endemic in 88 countries, with three clinical forms: CL, MCL, and visceral leishmaniasis (VL) (Thakur et al., 2018). CL is particularly common in Pakistan, where it is the second most prevalent vector-borne disease after malaria. Cutaneous leishmaniasis (CL) presents a significant health challenge in Pakistan, with reports indicating its widespread distribution and rapid spread (Khan et al., 2016). Particularly concerning are the disease-free regions along the borders with Afghanistan, which are reported to be at heightened risk (Jamal et al., 2013).

Despite being non-fatal, CL requires treatment to expedite healing, minimize scarring, and prevent complications such as mucosal leishmaniasis. Treatment often involves pentavalent antimonial drugs, but challenges include limited drug supply, potential side effects, and patient non-compliance with invasive treatment protocols (Gonçalves and Costa 2018**).** Prevention measures include wearing protective clothing, using insect repellent, indoor insecticide spraying, sleeping in elevated areas, and utilizing air conditioning (WHO recommendations).

In Pakistan, CL cases have surged in recent years, with an increase reported even in disease-free areas. The disease's endemicity is evident, with the highest number of CL cases reported in a decade in 2015. The complex interplay of factors such as human movement, environmental changes, and the presence of sand fly vectors contributes to the widespread distribution of leishmaniasis. The change global and local climate, agriculture and lifestyle of the people are main contributors to increase the vector population and lead to the spread of CL (Holakouie-Naieni *et al*., 2017). The current study was conducted to find out the frequency of cutaneous leishmaniasis in children below age fifteen of district Bajaur due to proximity with Afghan border. In the district Bajaur, the disease has turned into epidemic situation for last few years. About ten, of cases reported daily.

2. METERIALS AND METHODS

2.1 Study Area

The study took place in District Bajaur, situated at an altitude of 1126 meters above sea level. The district spans an area of 1290 square kilometers, with a population of 1,093,684 individuals who predominantly speak Pashto. It comprises seven tehsils and 120 village councils. Bajaur is bordered to the west by the Kunar Valley, separated by rugged Hindu Kush hills and several mountains passes like Nawa Pass, Ghakhi Pass, and Leti Sar.

The old route from Kabul to Pakistan via Nawa Pass used to traverse these hills before the adoption of the Khyber Pass. To the south lies the tribal district of Mohmand, and to the east, beyond the Panjkora River, are the hills of Malakand overlooking Batkhela and Dargai. The seven tehsils in District Bajaur are Bar Chamer Kand, Khar, Loe Mamund, Wara Mamund, Nawagai, Salarzai, and Utman Khel.

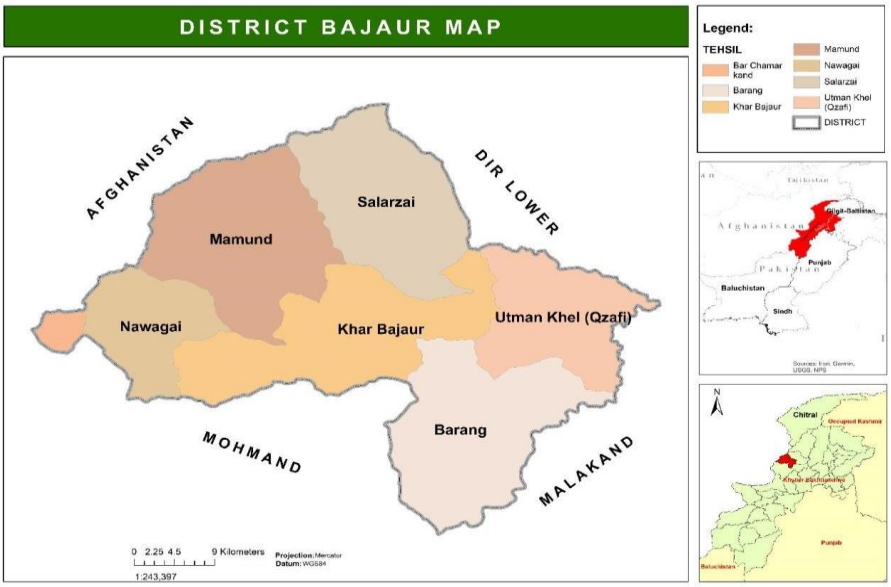


Figure.1 Map of District Bajaur;(Arif M.et al.,2022).

2.2 Study design and population.

This descriptive cross-sectional study took place at the Leishmaniasis Center of the District Headquarter Hospital in Khar Bajaur, KP, Pakistan. The study aimed to investigate factors contributing to the increase in cutaneous leishmaniasis (CL) cases among children under fifteen years old. A total of 150 suspected pediatric patients, each presenting with one or more lesions, were included in the study.

2.3 Sample collection and microscopic examination

A study conducted at DHQ Hospital Khar Bajaur from June to August 2022 collected specimens from children under fifteen suspected of infection. Lesions were cleaned and samples collected via pricking or puncturing, followed by preparation of thin blood smears on glass slides, drying, staining with Giemsa, and observation under a compound microscope at 1000X magnification. Positive samples displayed amastigotes, while negative samples lacked them. Participants completed a questionnaire on demographic and lesion details, including age, sex, lesion characteristics, house type, presence of domestic animals, and sleeping habits.

2.4 Ethics statement and data analysis.

This study received approval from the ethics committee of DHQ Hospital Khar. Patient information and data were collected with legal approval from the hospital administration. Samples were collected meticulously, and data were gathered through a questionnaire, then analyzed using Microsoft Excel.

3. RESULT

The study was conducted in District Bajaur, where a total of 150 samples were collected from its seven tehsils. Participants were grouped into three age categories, with the highest positive frequency (80%) observed in the 5-10 age group. Of the 150 suspected patients, 86 were male and 64 were female. Lesions with a duration of three months were the most frequently observed (44 out of 150). The face was the most commonly affected part among suspected pediatric patients. The majority of suspected patients belonged to a low socioeconomic status (133 out of 150), and a significant number resided in mud houses (127 out of 150).

3.1 Age wise frequency of cutaneous leishmaniasis.

A total of 150 suspected patients were investigated and grouped into different age groups. In the 0-5 age group, 73% tested positive, while 27% were negative. For the second age group, 5-10 years old,

the positivity rate was 80%. In the third age group, 10-15 years old, 70% of patients tested positive, with the remaining 30% testing negative.

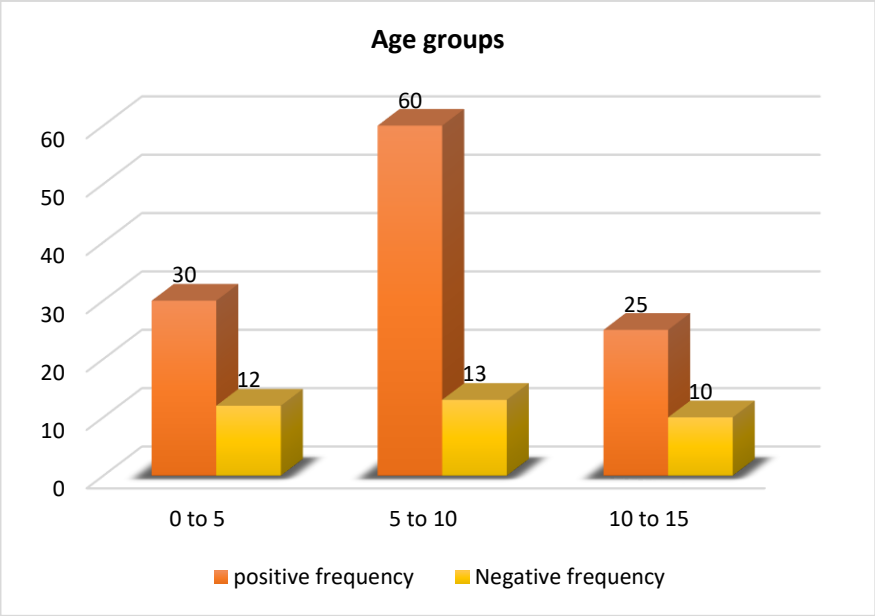


Fig 2. Age wise frequency of cutaneous leishmaniasis.

3.2 Gender wise distribution of cutaneous leishmaniasis

Patients were divided into two groups based on their gender. A total of 86 suspected patients were male among which 75% were positive and 25% were negative. About 64 suspected patients were female among which 73% positive and 27% were negative.

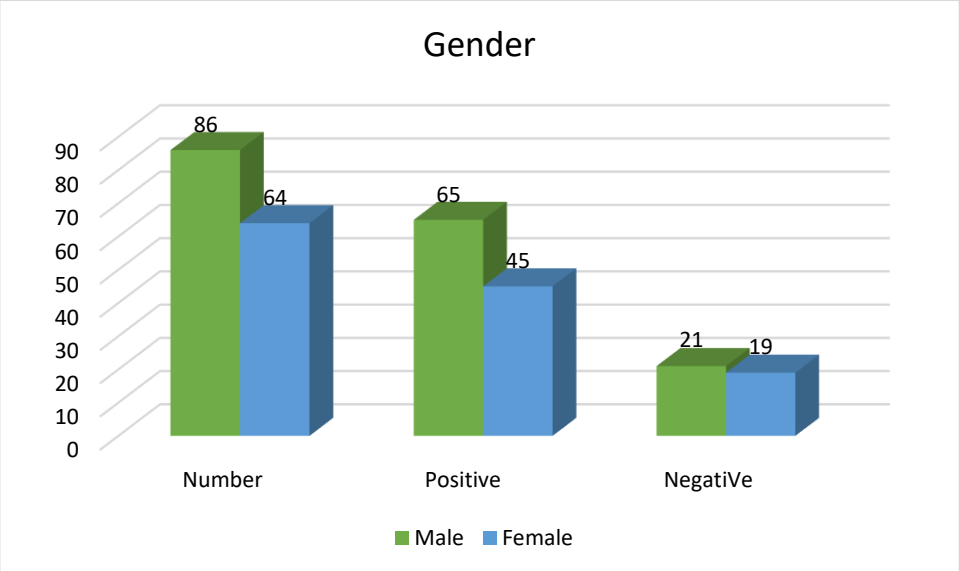


Fig. 3

3.3 Tehsil wise frequency of cutaneous leishmaniasis

The highest frequency of positivity in suspected patients were reported from Tehsil Mamund (86/150, which is 41.28%. The lowest frequency of positivity was from Tehsil Barang 2%.

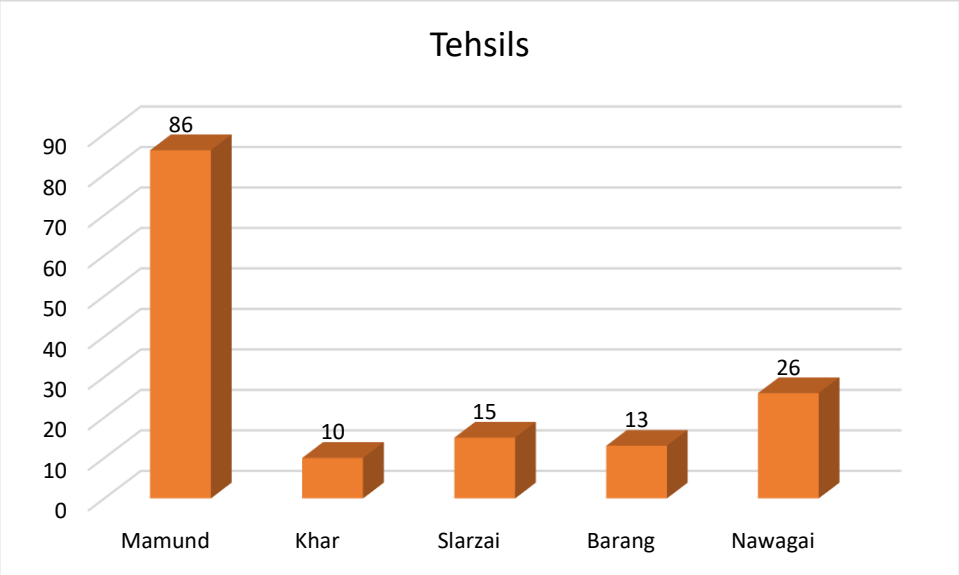
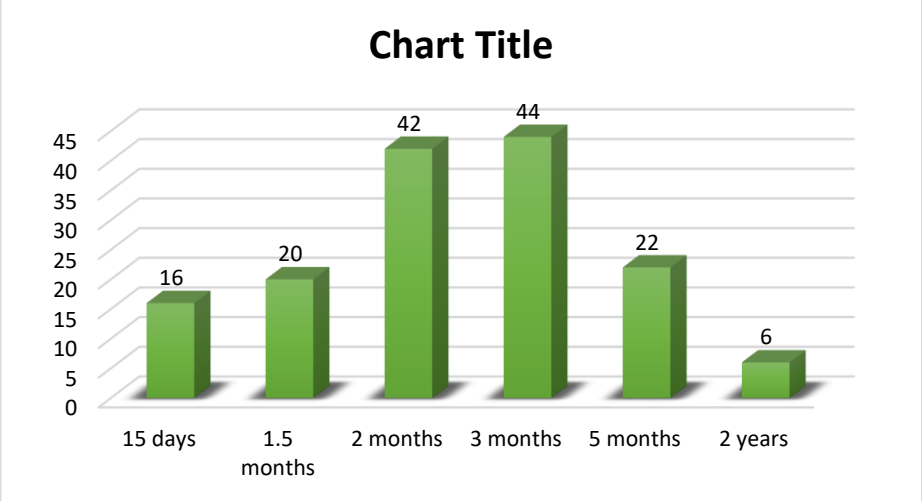


Fig. 4

3.4 Frequency of cutaneous leishmaniasis with respect to duration of lesions. The most frequently occurred duration of lesion was three months in 44/150 patients, while the least number of suspected patients were found to have lesion of two years duration 6/150.



3.5 Frequency of cutaneous leishmaniasis with respect type of houses. Total sample sizes were 150 out of which 127 inhabited in muddy houses while 23 inhabited in stone made houses.

Fig.

3.6 Frequency of cutaneous leishmaniasis with respect to site of lesions

Majority of the suspected patients were found to haven lesion on face 63/150 and hand were the lowest frequently affected part of body.

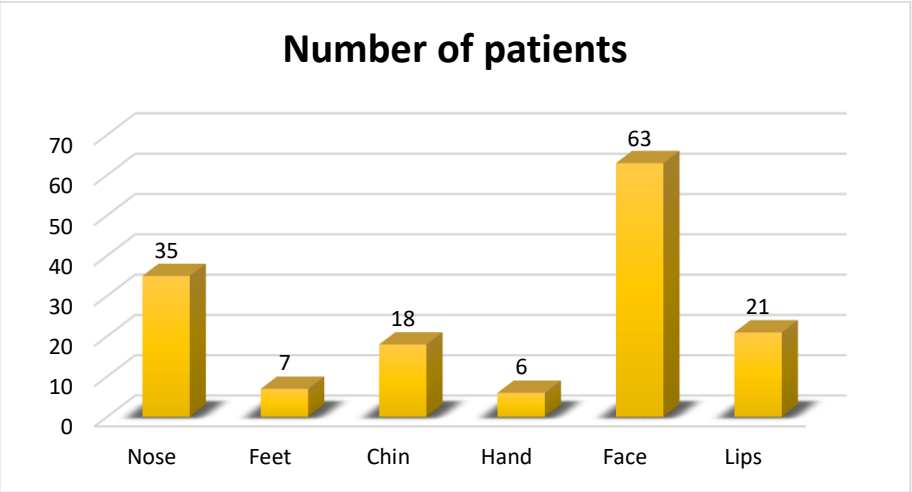


Fig.

3.7 Frequency of cutaneous leishmaniasis with respect to socioecomic status of patients.

It is concluded that, low socioeconomic status increases the risk of CL in children below age fifteen years. Patients with low socioeconomic status were living in mud houses that can increase the risk of CL because of breeding sites of sand flies.

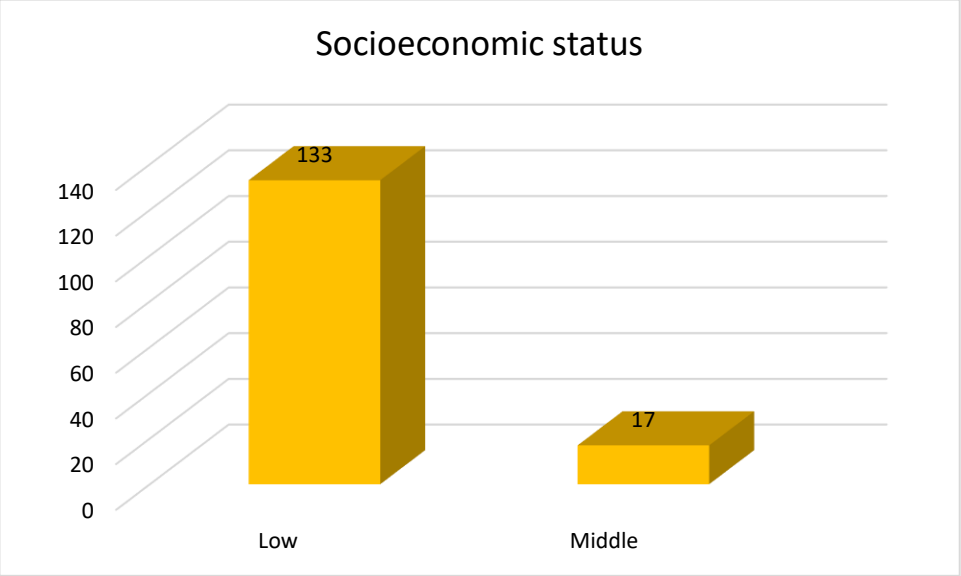


Fig.

CONCLUSION

Leishmaniasis, a significant yet neglected infectious disease, is caused by parasitic protozoa of the genus Leishmania. It is transmitted to mammalian hosts through bites from female Phlebotomine sand flies. Leishmaniasis manifests in three forms: visceral, also known as kala-azar (the most severe form), cutaneous (the most common form), and mucocutaneous. From recent research, it has been concluded that the frequency of cutaneous leishmaniasis is notably high among the local children population of District Bajaur. The study revealed that 73.33% (110 out of 150) of suspected pediatric patients tested positive for amastigotes, while 26.66% (40 out of 150) tested negative. Among the suspected patients, 57.33% were male and 42.66% were female, with the

majority belonging to a low socioeconomic status. Interestingly, no significant differences in positivity rates were observed between males and females.

The face emerged as the most common site of lesion, and the age group most affected was 5-10 years old. Given these findings, it is recommended that health authorities take immediate and practical steps to prevent and eradicate reservoirs and vectors of cutaneous leishmaniasis in Bajaur. Such measures are crucial for controlling the current increase in the frequency of cutaneous leishmaniasis in the region.

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