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TO STUDY THE PREVALENCE OF CUTANEOUS LEISHMANIASIS AND ITS EFFECTS ON THE HEMATOLOGICAL PROFILE OF PATIENTS IN DISTRICT WAZIRISTAN WANA

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Abstract

Background: Cutaneous leishmaniasis is an important health problem in Waziristan, especially in Wana and it impairs the local population both clinically and hematologically. Notwithstanding its spread, there is a dearth of studies on the effect of the disease on the hematological profile of its victims. Aim and Objectives: This study aimed to determine the prevalence of cutaneous leishmaniasis and assess its effects on the hematological profile of patients in Waziristan, Wana. The objectives were to identify the prevalence of the disease, analyze the hematological abnormalities associated with it, and examine its distribution across different age groups (0-50 years). Materials and Methods: A total of 200 samples were collected from various hospitals in Waziristan Wana, representing a population of 152,891 people. Including skin lesions, were examined using microscopy, to identify Leishmania species. Blood samples were analyzed for hematological abnormalities, including normocytic normochromic anemia, neutropenia, monocytosis, lymphocytosis, and thrombocytopenia, using automated hematology analyzers. Results: The study revealed a high prevalence of cutaneous leishmaniasis, with significant hematological abnormalities observed, particularly normocytic normochromic anemia and thrombocytopenia. The face was identified as the most commonly affected site, with the younger age group (0-16 years) showing more pronounced hematological changes. Conclusion: This paper highlights the high incidence of cutaneous leishmaniasis in Waziristan and its significant effect on the hematological character of patients. The results point to the necessity of specific medical measures and preventive actions in the area.

Keywords: Cutaneous leishmaniasis, hematological profile, prevalence, public health

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INTRODUCTION

Leishmaniasis is a disease which is caused by to leishmania parasite through the bites of infected female sand flies. Sand flies are the vector that carries the leishmania parasite from a variety of mammals, such as dogs, foxes, and rodent,s as a reservoir [1]. Only female sandflies are vectors because only they take blood meals, which are required for the maturation of the eggs. When the sandfly sucks blood from an infected host, it ingests macrophages containing amastigotes. After ingestion by macrophages and amastigotes, they differentiate into promastigots in the gut of a sandfly [2]. They multiply and then migrate to the pharynx, where they can be transmitted during the next bite. The cycle in the sandfly takes approximately ten days. Poverty, malnutrition, migration, and poor housing conditions are the most common risk factors for leishmaniasis. Its incidence is on the rise in certain geographic areas of the world, including Syria, Turkey, and Jordan, due to war-associated migration and the resulting refugee crisis [3, 4].

Only half of the 1.3 million new cases of leishmaniases that occur annually in 98 countries are reported. One million cases are of the cutaneous (primarily in Afghanistan, Algeria, Brazil, Colombia, Iran, Pakistan, Peru, Saudi Arabia, Syria, and Tunisia) or mucocutaneous (particularly in Brazil, Peru, and Bolivia) forms, while 300,000 cases are of the visceral form (90 percent in Bangladesh, Brazil, Ethiopia, India, Nepal, South Sudan, and Sudan)1. There are two categories of cutaneous cases: urban and rural. In Pakistan, "urban" or "anthroponotic" leishmaniasis is the most prevalent kind [5].

The genus Leishmania has more than twenty parasites, but four are the major pathogens which are leishmania Donovani (LD), leishmania Braziliensis (LB), leishmania Tropica (LT), and Leishmania mexicana (LM), Leishmania Donovani is the causative agent of kalaAzar or visceral leishmaniasis, which affects the reticuloendothelial system, includingthe liver, spleen, and bone marrow.Leishmania braziliensis causes mucocutaneous leishmaniasis [6]. While Leishmania tropica and Leishmania mexicana are the causative agents of cutaneous leishmaniasis [7]. Cutaneous leishmaniasis exhibits a broad spectrum of clinical manifestations from self-resolving infections to severe chronic disease [8]. The most often ineffective drugs are anti-parasitic in the most severe forms of the disease, and in other cases, the magnitude of the disease can result from an uncontrolled response of inflammation rather than replication of the unrestrained parasite [9].

Throughout the globe, about 1.5 to 2 million new cases are reported in a year, among VL reports 500000 cases, and CL reports up to 1.5 million. In 2018 a survey on leishmaniasis, 85% of new CL cases were reported in Afghanistan, Algeria, Bolivia, Brazil, Colombia, Iran, Iraq, Pakistan, the Syrian Arab Republic, and Tunisia [10]. Studied cutaneous leishmaniasis during 2013 to 2015, 7548 people were surveyed from the different endemic places and samples were collected from the ulcerating lesions of skin from 538 suspected CL cases, in north Waziristan, 244 south Waziristan 294, from April 2013 to January 20 [11]. Studied 803 patients from August 2018 to January 2019. Both sex and age showed the same effect of the occurrence of infection. It is concluded that the CL has appeared as a major health issue in Karak [12].

The aim of this study is to investigate the prevalence of cutaneous leishmaniasis and its effects on the hematological profile of patients in District Waziristan, Wana. Specifically, the study seeks to determine the overall prevalence of the disease in the region, assess its impact on various blood parameters, and analyze the distribution of cutaneous leishmaniasis across different age groups ranging from 0 to 50 years. The findings of this research will provide valuable insights for healthcare authorities, facilitating targeted interventions and the implementation of awareness campaigns aimed at preventing the spread of cutaneous leishmaniasis in the affected population.

MATERIAL AND METHOD

The study was conducted in various areas of Waziristan Wana, where a total of 200 samples were collected from different hospitals in a population of over 152,891 people after inform consent obtained from individual. These samples were used to diagnose and identify Leishmania species through multiple laboratory techniques. Tissue specimens, such as skin lesions for cutaneous leishmaniasis and bone marrow for visceral leishmaniasis, were examined for parasites under a microscope. Additionally, blood tests were conducted to detect antibodies or immune responses to the parasite, which were particularly useful in visceral leishmaniasis cases

The materials required for sample collection and examination included antiseptics, sterile gloves, syringes, sterile gauze pads, and Giemsa stain for microscopy (13). A sterile procedure was followed to collect skin lesion samples, with superficial scraping of the lesion under local anesthesia. After scraping, the material was transferred to a transport medium or slide, which was labeled with relevant patient information for identification and transportation. Giemsa staining was performed for thick blood smears, where slides were air-dried, stained, and examined under a microscope for the presence of the parasite.
In addition to sample collection, phlebotomy was performed for blood draws as part of the diagnostic procedure. The procedure included the assembly of necessary equipment, identification of the patient, and selection of an appropriate vein. Following infection control protocols, a vein was punctured, and blood was drawn using a sterile needle. The blood samples were placed in EDTA tubes, labeled accurately, and transported to the laboratory for further testing. For diagnostic purposes, automated hematology analyzers were utilized to analyze blood cells and identify potential anomalies that could aid in the diagnosis of infections such as malaria or dengue. These advanced devices provided cellular and morphological analysis, assisting in the identification of various disease states. Data was analysis using spss version 25 for there prevalence and correlation.

RESULTS

In the study the distribution of gender categories within a given dataset, showing that children make up the largest group, comprising 60% of the total population. Females represent 26%, while males account for 15%. This visual representation highlights the predominance of children in the sample, followed by females and males show in Figure 01.

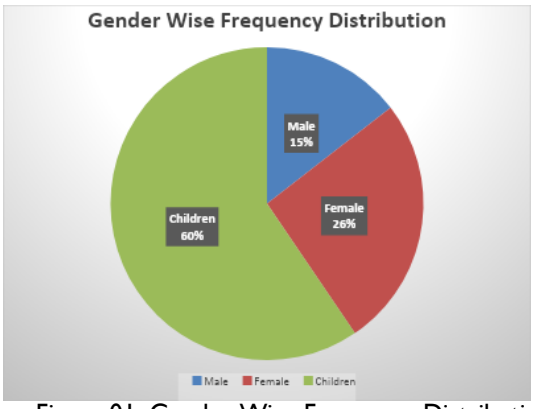

Figure 01: Gender Wise Frequency Distribution.

Samples were collected from the affected area of the patient and also took blood sample from a positive patient, for to watch the effect of cutaneous leishmaniasis parasite on the hematological profile of the patient. The ratio of positive cases is most common in those under 15 age, which is 119 (60%), and the ratio above the age of 15 to 60 was 81 (40%) shown in figure 02.

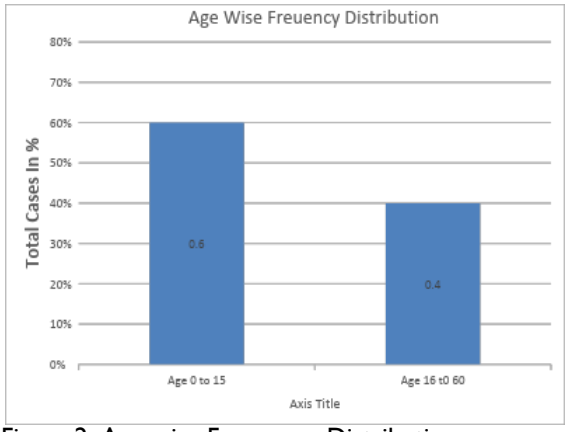

Figure 2: Age-wise Frequency Distribution

The results reveal that the face is the most frequently affected area, accounting for 46% of the cases. The upper limb follows, with 33% of the cases presenting lesions in this region, while the lower limb is affected in 22% of the patients shown in the figure 3. These findings highlight the face as the primary site of infection in individuals with cutaneous leishmaniasis.

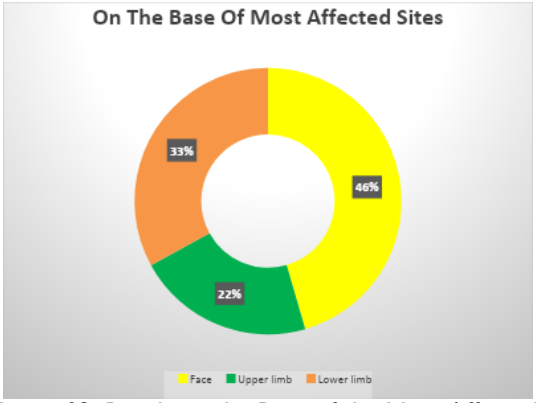

Figure 03: Result on the Base of the Most Affected Sites.

Among the various conditions, normocytic normochromic anemia was observed in n=25 males and n=29 females. Neutropenia affected n=5 males and n=7 females, indicating a lower occurrence of reduced neutrophil count. Monocytosis was seen in n=11 males and n=14 females, showing a slight increase in monocyte count in both groups. For lymphocytosis, n=22 males and n=30 females were affected, indicating an elevated lymphocyte count. Lastly, thrombocytopenia was found in n=25 males and n=32 females, showing a notable reduction in platelet count across both gender in table 01.

Table 01: Cutaneous leishmaniasis and its affect on hematological profile:

Hematological profile	Male	Female
Normocytic normochromic anemia	25	29
Nutropenia	5	7
Monocytosis	11	14
Lymphocytosis	22	30
Thrombocytopenia	25	32

For the normocytic normochromic anemia condition, n=35 patients in the age group of 0 to 16 years and n=24 patients in the age group of 16 to 60 years were affected. In the case of neutropenia, n=16 patients in the 0 to 16 years group and n=8 patients in the 16 to 60 years group exhibited reduced neutrophil counts. Monocytosis was observed in n=14 patients from the 0 to 16 years group and n=6 patients from the 16 to 60 years group. The condition of lymphocytosis was present in n=25 patients from the 0 to 16 years group and n=14 patients in the 16 to 60 years group, reflecting a higher prevalence of elevated lymphocyte counts in the younger age group. Lastly, thrombocytopenia affected n=35 patients in the 0 to 16 years group and n=23 patients in the 16 to 60 years group, indicating a more pronounced reduction in platelet count in the younger age group.

Table 02: Cutaneous leishmaniasis and its effect on hematological profile on age-wise

Hematological profile	Age (0 to 16)	Age (16 to 60)
Normocytic normochromic anemia	35	24
Nutropenia	16	8
Monocytosis	14	6
Lymphocytosis	25	14
Thrombocytopenia	35	23

DISCUSSION

cutaneous leishmaniasis Waziristan, Wana, and its impact on the hematological profile of patients with the disease. The results indicated that the disease was very prevalent with significant hematological abnormalities of normocytic normochromic anemia, thrombocytopenia, and lymphocytosis. The face was

the most frequently affected area and younger people, especially those within the 0-16 years of age, experienced more frequent occurrence of these hematological changes. These findings are in line with the findings of past studies which emphasize systemic impacts of cutaneous leishmaniasis on different blood parameters.

The higher prevalence of CL in males was due to the cultural habits of that area, because the females used well-covered clothes, which reduces the probability of sandfly bites. In addition, women are compelled to be in the home before evening, Males usually sleep without shirts during summer, which exposes them to sandfly bites. Males traveling for jobs and keep their females under control to be in houses are an important factor for the higher prevalence in males. In the recent study, all the lesions (except two on the runk) were present on the exposed parts of the body [14].

Both anthropologic cutaneous leishmaniasis (ACL) and zoonotic cutaneous leishmaniasis (ZCL) are found in Pakistan, along with visceral leishmaniasis (VL), with the cutaneous form being slightly more common. The purpose of this study was to map out the different leishmaniasis presentations in Pakistan geographically [15].

Leishmania infantum-induced visceral leishmaniasis (VL) has been sporadically seen in northern areas at elevations between 1,432 and 2,873 meters. The three most often found risk factors for VL were the prevalence of dogs, agricultural settlements, and hilly areas. On the other hand, the main risk factors associated with cutaneous leishmaniasis (CL) were identified as insufficient preventive measures, mobility patterns, the presence of domesticated animals, cow dung, living in mud homes, and sleeping outside. Medical entomologists and other health experts can use this research to help develop targeted and cost-effective leishmaniasis surveillance and control techniques in Pakistan [16]. at 1997, an epidemic of anthroponotic cutaneous leishmaniasis at an Afghan refugee community in northwest Pakistan was caused by migrants from Kabul [17,18].There's a chance that future NATO delivery participants from this area could also be the source of old world cutaneous leishmaniasis in NATO forces, which could spread to their own nation. The majority of infected individuals have lesions on their hands, feet, and faces because the highest prevalence of lesions was found on exposed body parts that were open to mosquito bites [19].

CONCLUSION

The hematological profiles of the patients are the following; the red blood cell shows the normocytic normochromic anemia, the neutrophil were less in number because of skin lesion or inflammation, and the monocyte and lymphocyte were found high in number the condition are termed as monocytosis and lymphocytosis, the platelets ratio are normal and in a few cases less in number than normal which is called thrombocytopenia.

In order to minimize the prevalence of CL, Various steps are recommended i.e. the health professionals and community should be aware about the disease risk, personal protection is essential from sand-fly by using nuts, spray, and many specific lotion, remove the infected dogs and other animal like rodents and spraying insecticides in homes, rodent burrows and dog habitats to remove the vectors and minimize the spread of infection.

CONFLICTS OF INTEREST

Not Applicable.

AUTHOR CONTRIBUTION

All authors are contributed equally.

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None.

INFORM CONSENT

Informed consent was obtained from the patients.

ETHICAL CONSIDERATIONS

Not Declared

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