ORIGINAL ARTICLE

FREQUENCY AND TYPES OF LEISHMANIASIS IN KHYBER PAKHTUNKHWA (KPK)

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ABSTRACT

Objective: to know and document the risk of factors for category leishmaniasis.

Material and Methods: Cutaneous leishmaniasis is rapidly and easily diagnosed by direct examination of impression smear from lesion. Smear was stained by giemsa or Wright stain. In active lesion amastigote form of parasite are easily recognized intracellularly and extracellularly. Diagnosis of visceral leishmaniasis was established by demonstration of leishmania parasite in giemsa smear, demographic information and physical signs of patients. 340 cases were collected from OPD of dermatology unit of KTH and HMC Peshawar. Data was collected from jan 2015 to oct 2015.

Results: During 10 months period, 340 positive cases were identified. In this study all cases were of cutaneous leishmaniasis. Commonly effected age group was 16-30 years (42.8%) and more males were among this group.

Key Words: Leishmaniasis,Prevention,Risk factors.

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INTRODUCTION

This protozoan disease is an emergent threat. It is endemic in areas of tropic, subtropics. Currently, it has wider geographical distribution. This may be attributed to risk factors that include malnutrition and immunosuppression, environmental changes, deforestation, also take into consideration unavailability of commercial vaccine and efficient drug therapies in developing countries. So for international health community, the elimination of the disease is still a challenge.

Different species of the genus Leishmania causes Leishmaniasis. Each specie has its own geographical zone. Many different mammalian species can be affected by these parasites, particularly human beings[1]. There are more than 20 different species that can cause leishmaniasis in man[2]. It is one of the zoonotic diseases transmitted to a man during a bite of vector sandfly of genus phlebotomus[3]. Clinically, based on the changes it produces and infection that arises after bite of infected sandfly, it is divided into cutaneous, mucocutaneous, diffuse cutaneous, visceral leishmaniasis.

Cutaneous leishmaniasis are of further types.

1. Oriental sore (an old world form) caused by L. tropica
2. Espundia or nasopharyngeal or a new world form caused by l. braziliensis & l. mexicanacomplexes[4].

The leishmaniasis caused by leishmania has different way of presentation, It ranges from self-limited or can be self-healing cutaneous form to life threatening fatal sytemic disease[5]. It is an old disease with a history. Therefore it have been described dating back to the ninth century (Balkan sore). In different countries, various names are given to cutaneous leshmaniasis. Baghdad boil in Iraq, Dehli boil in India and Saldana in Afghanistan[6].

Despite it's discovery 100 years back, it is yet not eradicated and is still on the rise in many parts of the world[7]. If timely, necessary and adequate control measures are not taken properly, it might rise as a serious threat to health all over the world. Every year about 1.5 million cases of cutaneous leishmaniasis are being reported worldwide, with the major contribution from Iran, Iraq, Afghanistan, Saudi Arabia, Algeria, Peru and Pakistan[8].

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By the report of world health organization, there are about 350 million people who are at risk and leishmaniasis itself is endemic roughly in 88 countries worldwide[9]. Presently, it has become a serious health problem round the globe. In Pakistan, particularly in it's rural parts it has become a major threat[10]. It's prevalence has become significant in Pakistan and it has been reported from all provinces of the country. The approximated annual data of new cases of cutaneous leshmaniasis is about 15 lacs and visceral leshmaniasis is 5 lacs. Between 1984-1994 there were about one hundred thousand deaths among 2.8 lac people due to viceral leishmaniasis in endemic area of southern Sudan. In Afghanistan and other surrounding states, epidemic of cutaneous leishmaniasis is continuously growing with hundreds of cases. In Pakistan, it was first time reported way back in 1960. By then, it was very narrowly distributed mainly in the northern mountainous region, but currently it has spread round the country affecting almost whole of it. It has become endemic at interior Sindh, Multan and Balochistan[11]. Classic forms of disease or it's variants are present in Pakistan including some rare manifestations including chancriform, palmoplantar, acute paronychial, zosteriform, erypsipeloid and annular forms. It is the sandfly vector of phlebotomus and lutzomyia species which determines the geographic distribution of cutaneous leishmaniasis[12]. The sandfly lives in dark and damp places. They get infected after they fed on the infected animals and once they get infected by leishmania it remains and becomes a vector for it. It can then transfer the parasite to both other animals and human beings. In comparison with mosquito, sandfly is unique. It is a silent flier with a small size (2-3mm) and because of it's small size it is can pass easily through the mosquito nets. They are active and more operational in the evening and at night. This disease affects many other animals who are more prevalent in rural and forest regions and these infections exists in them mainly as zoonoses. Leishmanin skin test indicates earlier asymptomatic infection. It is positive in about 9% of healthy people living in the endemic areas. Simple cutaneous leishmaniasis caused by l. tropica is more common in Pakistan and India. Man itself is a very common reservoir for the parasite.

Life cycle begins when sandfly (female) bites an infected patient, sucks up the blood which contains the leishmanial amastigote form. It undergoes massive division forming huge number flagellates that is the promastigote form. It moves to anterior part of alimentary canal without infecting the salivary glands. The sandfly inoculates these promastigote from which are taken up (phagocytosed) by human first line cells, the macrophages. These promastigote forms when get inside the macrophages lose their flagella and changes into amastigote form that increase their number by binary fission. These amastigote forms are very notorious and physically destroy the infected macrophages by swiftly dividing themselves[13]. The released amastigotes after destroying the macrophage infects the other healthy macrophages and the cycle continues with full strength until man immunocompetent cells are destroyed and this thus results in developing the immnosuppressed state. The ultimate fate of parasite depends on itself and host factors and is not clearly understood.

Different species have their own way of spreading and affecting the host. Some like the viscerotrophic (l.donovani) spread throughout the RE cells and system and result in visceral leishmaniasis, whereas the dermotrophic ones (l.major) remain in inoculation site and give rise to the cutaneous form of disease. However it has been reported that skin infection can spread and can give rise to systemic manifestations. The cutaneous infections caused by dermotrophic species is slow and late and usually limited, spreading to adjacent skin (satellite lesion) or through lymphatics to regional lymph nodes. L.braziliensis posesses an ability to migrate to mucosa of oropharynx where it remains dormant. The reactivation of this results in very serious and destructive mucocutaneous form of lesion, Espundia. As result of treatment, the viscerotrophic parasite becomes dermotrophic in post kalazar dermal leishmaniasis[14].

MATERIAL AND METHODS

The data was collected from the OPD (out-patient department) of Dermatology Unit of Khyber Teaching Hospital and Hayatabad Medical Complex, (HMC) Peshawar, Pakistan. From January 2015 to October 2015, a total of 340 cases collected from these departments. Cutaneous leishmaniasis can easily diagnosed by direct observation of parasite in impression smears, skin scarpings or skin biopsies stained with leishman Wright or giemsa stain[15]. All the cases were diagnosed on the basis of clinical findings and smear examination. Amastigotes forms of parasite are easiest to find in active lesion. Molecular test are more accurate, but not readily and easily available in poor health settings. Direct giemsa stained smear are simple, easily available and affordable.

RESULTS

During 10 months period, a total of 340 cases were identified. Which is quite high as compare to previous years from these areas? These patients were resident of different cities of KPK like Bannu, Tank, D.I. Khan, Miranshah, Warsak, Swat, Dir, Kohat and Peshawar Table 1.

Table 1: Type of Leishmania, area-wise and gender-wise distribution

S. No	Area	Type of Leishmania	Number Affected	Male	Female
1.	Bannu	CL	34	24	10
2.	D. I. Khan	CL	31	14	17
3.	Dir	CL	30	13	17
4.	Tank	CL	41	19	22
5.	Miranshah	CL	44	21	23
6.	Kohat	CL	33	13	20
7.	Warsak	CL	29	15	14
8.	Peshawar	CL	17	10	07
9.	Swat	CL	35	17	18
10.	Jamrud	CL	16	06	10
11.	Charsadda	CL	11	04	07
12.	Mardan	CL	09	06	03
13.	Swabi	CL	07	02	05
14.	Nowshera	CL	03	01	02

Table 2: Age wise distribution

Age group in years	Frequency and %ages
0-5	15(4.2 %)
6-15	35(10%)
16-30	150(42.8%)
31-45	100(28.5%)
46-55	30(8.5%)
56	20(5.7%)

Table 3: Gender and age wise distribution

Age group in year	Male	Female
0-5	10	5
6-15	22	13
16-30	107	43
31-45	78	22
46-55	27	03
56	13	07

One hundred and sixty five patients were males and one hundred and seventy five were females Table 2. Patient aged 03 months to 60 year were included in the study Table 3. Duration of illness ranged from 01-12 months. Most of cases were during rainy season; however few cases were seen in summer. Most of the time leishmania lesion were seen on exposed parts of patients (face, neck, hands, arms) but on seldom occasions they were also seen on unexposed parts like abdomen and back. In this study all the cases were of cutaneous leishmaniasis.

DISCUSSION

Pakistan is situated in the north west of South Asia. It is a tropical country. Pakistan share its borders with Afghanistan, China, Iran and India. Unfortunately, all these states are also endemic for the leishmania. Both visceral leshmania and cutaneous leshmania are endemic in Pakistan. Anthroponotic CL and Zoonotic CL is reported endemic in various parts of the country. In our study higher prevelence of Leshmaniasis is reported in children, during 2009 a study was conducted by Hamid et al[16], their results are in consistent with our study. All age groups including children were affected by this infectious disease. In endemic areas Children are at greater risk than adult. A similar study was reported by Armijos, R.X et al, in which children less than 12 years were nearly 03 times more likely to have cutaneous leishmaniasis[17]. Malnutrition and weak immune system may play important role in development of disease.

The study was conducted by Shoaib et al[18], to see the prevalence of this disease in childhood, as due to considerable toxicity of chemotherapy the treatment is difficult in children. The study revealed a considerable prevalence of CL (cutaneous leishmaniasis) in childhood. The risk factor for recurrence of leishmaniasis may be incomplete therapy of initial disease.

Iran is one of the few major endemic areas of Cutaneous Leshmaniasis infection. It was concluded in one epidemiologic study on childhood CL that children comprise a great number of the infected cases[19]. The observation is consistent with our study. Similar observation was reported by Emami et al, in which active lesions and scars were 4% and 6% in school children respectively[20].

In our study, males are more vulnerable to leishmania than females. This may be because of reason that females do pardha and covered themselves most of time which thought to give them protection against the sandfly. On other hand males usually do not cover themselves especially while sleeping at night time or

males were more expose to different agricultural areas. A similar observation was reported by Q-Jamal et al in[21]. In another study conducted by in 2016, higher (57.4%) infection reported in males as compared to female population[22]. In KPK in Surgul Village of Kohat, a similar observation reported by Khan I et al, that CL is more prevalent in males than females. Males are more social. They spent more time outside during evening and night[23]. A similar study conducted in Nepal shows higher prevalence in male (9.9%) than females (8.3%)[4].

For better understanding of parasite, risk factors and host immunological processes that characterize other co-infection such as tuberculosis and HIV, more molecular and cellular studies will be needed.

PREVENTION

Leishmaniasis is still a gioble health problem. In Khyber Pakhtunkhwa cutaneous leshmaniasis is the most common type. The practical way to control the incidence of disease is personal protection. Current control strategies for leishmaniasis include early case detection and its treatment, reservoir and vector control Repaid diagnosis and treatment is important for both patients and for the community. Leishmania species do not remain viable outside host, they can be easily inactivated by 2% glutaraldehyde/formaldehyde or 1% sodium hypochloride. They are also susceptible to heat of 50 to 60c Sandflies are highly susceptible to insecticides. House spraying is targeted on the control of endophilic sandflies (that rest most of time indoors after feeding) Several studies have shown that pyrethroid-treated bednets provide 50-65% protection against leishmaniasis The use of insect repellents (such as Diethyl-toluamide and DEET) or protective clothing has been suggested as a prophylactic measure[24].

CONCLUSION

There is no antileishmanial vaccine available so control measures are dependent on personal protection from sandfly bites and on reservoir or vector control. Leishmaniasis control remains a difficult task and eradication of the disease is even more difficult.

RECOMMENDATAIONS

It is essential that public health authorities be more aware of conditions to improve personnel protective measures and environmental sanitations. The current leishmaniasis control programs have failed mainly because of the insufficient regional health delivery systems and due to the limited local resources. In this regard, WHO has classified leishmaniasis as an emerging and uncontrolled disease (belonging to category 1 of the diseases). To know the actual burden of the disease that may prove helpful for the health authorities to device control strategies of leishmania in Khyber Pakhtunkhwa.

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Following authors have made substantial contributions to the manuscript as under:

Mumtaz S: Concept, main idea.
Munir AH: Data collection.
Asghar M: Statistics.
Naheed: Bibliography.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.