

**CUTANEOUS LEISHMANIASIS IN DADU, HYDERABAD AND JAMSHORO DISTRICTS OF SINDH, PAKISTAN AGE WISE INTENSITY CORRELATION WITH PRIMARY HOST DOGS, CAUSES, TREATMENT, PREVENTION AND ERADICATION OF DISEASE****Dr. Imtiaz Ahmad¹, Dr. Farah Sharif², Dr. Anzar Ahmad³, Dr. Ayub Khan⁴ and Dr. Alvina^{5*}**^{1,2}Biological Research Centre, University of Karachi, Lab No-15.³Department of Community Medicine, Dow Medical College, DUHS, Karachi.⁴Department of Applied Physics, University of Karachi.⁵Department of Pharmacology, Jinnah Sindh Medical University, Karachi.***Corresponding Author: Dr. Alvina**

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ABSTRACT

The Cutaneous Leishmaniasis (CL) in Hyderabad, Dadu and Jamshoro districts of Sindh province, Pakistan, age wise correlated with the primary host i.e. dogs with reference to intensity of skin disease in humans was found statistically positively correlated. Causes, treatments and cure in the light of prevention and eradication of the disease is also briefly discussed.

KEYWORDS: Cutaneous Leishmaniasis.**INTRODUCTION**

The purpose of this study was to see the situation of cutaneous Leishmaniasis (CL) in the above three districts of Sindh and possible threats of epidemics and spread to neighboring districts. In the far Eastern Mediterranean Region (EMR) of the World Health Organization (WHO) Leishmaniasis is considered as a principal health problem. The disease most commonly affects the children due to less developed immunity. In most of the cases disease also affects the other family members indicating limited flight range of sand fly, person to person transmission or genetic predisposition. (Reithinger et al. 2010; Oliveira et al. 2015) Cutaneous leishmaniasis is a vector born, usually a self-healing disease which spread through the bite of a female sandfly of dipteran, family Psychodidae, subfamily Phlebotominae, *Phlebotomus papatasi*. The vector *Phlebotomus papatasi* is chiefly distributed in Asia Minor regions, Southern Asia (including Pakistan), Northern Africa and Southern Europe (WHO, 1998). Cutaneous leishmaniasis (CL) in India is called Delhi Boil, in Iraq Baghdad, Boil, in Bangladesh, Bangladeshi Boil and in Afghanistan, Saldana (Abdul Ghani, et al. 2008). About 1.5 million new cases of this disease are reported every year from across the world mainly from Algeria, Afghanistan, Sudan, Bangladesh, India, Pakistan, Nepal and Brazil (WHO, 1996) leading to about one hundred thousand deaths due to visceral Leishmaniasis (VL) annually (Ashford, 2000).

More research work on prevalence and molecular studies of cutaneous leishmaniasis are reported from Sindh province of Pakistan, as compared to other regions, for example (Nawab et al. 1997) noted 90 confirmed cases out of 120 referred to Dr. Ehsanullah's Laboratory, Karachi for diagnosis. But the present study areas i.e. Dadu, Hyderabad and Jamshoro districts appear to be neglected in literature although Dadu especially Juhi taluka has been mentioned often, with reference to immigration of CL patients brought from Baluchistan and Afghanistan as it shares borders with Baluchistan and Afghanistan with patients from Afghanistan refugees (Bhutto et al., 2004; Kolachi et al., 2005; Ejaz et al., 2008; Reithinger et al. 2010; Sharif et al., 2017).

Dawit et al. (2013) stressed that epidemiological studies on leishmaniasis must not be limited to endemic areas but it should also continue in other areas. Kassi et al. (2008) only observed that CL was reported from all the provinces of Pakistan but Bhutto et al. (2008) deduced that it is endemic in Pakistan. ZCL (Zoonotic Cutaneous Leishmaniasis) spread from animal to animal or from animal to man, (ACL) Anthroponotic Cutaneous Leishmaniasis from human to human or DCL (Diffused Cutaneous Leishmaniasis resulting in chronic skin and disseminated lesion similar to that of lepromatous leprosy was reported by Bari et al. (2011). Although Klaus and Frankenburg (1999) and Ashford (2000) stated that *Leishmania* parasitic spp. (i.e. *L. tropica*, *L. major* and *L. infantum*) are found intracellularly in monocytes and

macrophages and they may also be found extracellularly in a giemsa stained smear. The giemsa stained amastigotes appear as blue oval bodies, 2-5 μm in diameter having a blue oval nucleus in vitro culture. The flagellated motile promastigotes are 10-15 (μm).

MATERIAL AND METHOD

During the present study a survey was made in the city of Hyderabad of Sindh province which embraces three districts i.e. Dadu, Jamshoro and Hyderabad. The city is the second largest (population wise) in Sindh province

and there are many skin diseases hospitals, health centers and pathological laboratories which were visited to locate and identify CL patients with special reference to history of leishmaniasis in a survey report and an analysis of diseased (CL) patients district wise and age wise statistically are presented using Minitab recent software version 17 and age groups are made in human beings and in dogs and explanation is given under.

RESULT

Age wise correlation between C1 (Human) and C2 (Dogs)

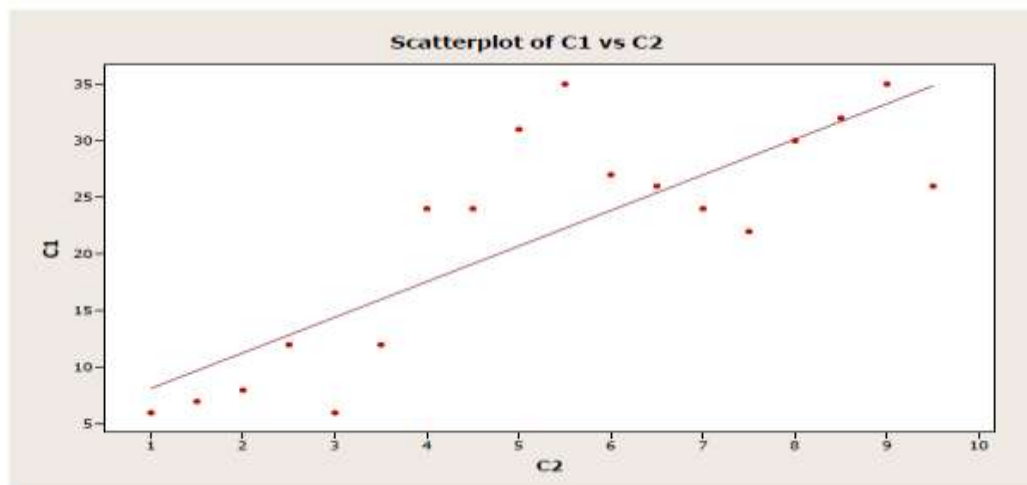


Fig 1: shows a regressive analysis between C1 and C2 as under $C1 = 5.019 + 3.139 C2$ Positive Correlation. Intensity of CL corresponds to the age of humans between 10 to 25 years in Dadu district followed by Hyderabad and Jamshoro and for the dogs 1 year to 8 years.

Co-efficient of determination of this relationship between C1 and C2 is about 67% i.e. adjusted to the Co-efficient of determination which is 65%.

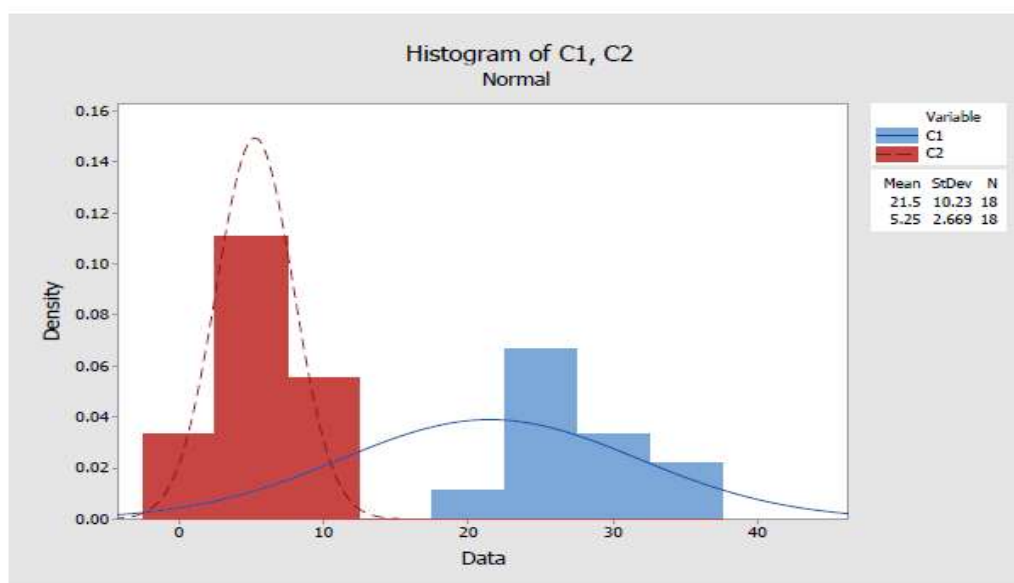


Fig 2: This histogram also shows the same relation between C1 and C2. For C1 the mean is 21.5 and for C2 mean is 5.25. The Standard deviation for C1 is 10.23 and SD for C2 is 2.67. The Co-efficient of variation for man is 47% whereas the Co-efficient of variation of dog is 51%.

DISCUSSION

For studying the reservoir of *leishmania* parasites in the above districts, the primary animal host i.e. the dogs with reference to districts wise and age wise intensity of Cutaneous Leishmaniasis (CL) were also surveyed and statistically analyzed and it was seen if intensity of the skin disease in the primary animal host i.e. dogs is directly proportional and positively correlated with the end host i.e. human patients (Qureshi et al., 2018). Photographs of the lesions of the disease in the primary and end host are also given. Diagnosis, causes, cures and treatment of the human patients with reference to prevention and eradication of leishmaniasis are also briefly discussed. Most cutaneous leishmaniasis lesion heals in 8 to 12 months, however it is quite painful to live for one year with a facial lesion (on cheek, nose, lips and chin) which could disfigure face and often cause serious complications because of secondary bacterial and fungal infections. Appropriate treatment is the only choice for these patients for the early healing of their lesions. Dowlati (1996), Al-Majali et al. (1997) and Reithringer et al. (2005) have discussed (a) thermotherapy using hot objects or acids but these have side effects, sometimes leaving permanent scars of lesions, (b) Cryotherapy using liquid nitrogen and surgery of the lesions and (c) the intralesional injections of pentavalent antimonials i.e. meglumine antimonite and sodium stibogluconate commercially called glucantime with generic name "Avantis and pentostam (Glaxo/ Wellcome) are practiced around the world (WHO, 1990). Also plant alkaloid Berberine was found seriously affected by cutaneous leishmaniasis in rats. Harmaline extracted from *Peganum harmala* showed antiprotozoan activity (Evans et al., 1987, Wright et al. 1990). Steroidal alkaloid holamine and Hydroxyl holamine extracted from the plant *Hoarthena* and *Curtisii* also showed Leishmanicidal activity against *Leishmania donovani* (Kam et al., 1998).

Cure and eradication of Leishmaniasis.

Early diagnosis and treatment of patients along with curing of skin lesion are important to prevent spread of disease. Breaking the chain of the life cycle of the *Leishmania* parasite (i.e. elimination of sandfly vector) or destruction of animal reservoir i.e. killing Rodents and Dogs is remarkably effective in leishmaniasis eradication. Ashford et al. (1995) and Klaus and Frankenburg (1999) have pointed out that by destroying animal food places and by eliminating burrows of rodents is quite effective. Successful control of leishmaniasis is also achieved by the confinement of sandfly including the elimination and annihilation of its breeding sites by cleaning garbage, litters and debris near human residence and by covering cracks, crevices in walls and roofs and spraying with effective synthetic insecticides i.e. deltamethrin (pyrethroid group) with generic name Cyhalothrin under windows, could be very effective. Mosquito nets are not helpful in preventing bite of sandfly because of larger mesh size. Smaller mesh size is required. Nets if impregnated with insecticide

such as permethrin or deltamethrin are more helpful (Ejaz et al. 2008). By plantation Bougainvillea Glibra as stated by Schlein et al. (2001) and Alten et al. (2003) could significantly reduce the occurrence of cutaneous leishmaniasis.

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