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Prevalence of Cutaneous Leishmaniasis among HIV and Non-HIV Patients attending some Selected Hospitals in Jos Plateau State

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A B S T R A C T

Prevalence of cutaneous Leishmaniasis among HIV and non – HIV patients attending some selected hospitals in Jos, Plateau state was carried out. A total of 290 samples collected were blood samples and tissues from the upper surface of the body parts of patients attending hospitals in Kanke, Langtang North and South Local Government Area (L.G.A) of Plateau State. Microscopic analysis was done using conventional method on samples collected. Results showed that only 4(1.37%) out of 290 stained film samples examined were positive with leishmania parasite. In Kanke L.G.A, out of 114 samples examined, only 1(0.88%) was found positive for the parasite. In Lantang North L.G.A, 2(1.71%) were found to be positive for the parasite out of 117 samples examined and out of 59 samples examined in Lantang South L.G.A 1(1.70%) was found positive for the parasite. There was no significant differences ($p>0.05$) in the prevalence of cutaneous leishmaniasis based on geographical location of the people examined. Samples from each local government were analysed for HIV positive and non-positive with leisions and with cutaneous leishmaniasis. There was significant difference ($p<0.05$) based on prevalence of cutaneous leishmania among HIV positive and non HIV positive patient in the three local government areas. Leishmaniasis is one of the neglected tropical disease, therefore public enlightenment programmes will go a long way in sensitization.

Introduction

Leishmaniasis is a zoonotic infection whose aetiological agent is an obligate protozoa of the genus Leishmania. The vector-borne infection is accompanied by a clinical spectrum viz: asymptomatic infection and three major clinical syndromes consist of visceral Leishmaniasis (VL; also known as 'kala-azar'), cutaneous Leishmaniasis (CL), and mucosal Leishmaniasis (ML) (Marfurt *et al.,* 2003). About 200 million people in Asia, Africa, South and Central America, and southern Europe live in areas where the disease is common (Martins *et al.,* 1998). Geographical distribution shows that, Leishmaniasis is divided into two viz: Old World and New World Leishmaniasis (Marfurt *et al.,* 2003). Infection is transmitted through hematophaguss and flies of the Phlebotomus genus in the Old World and the Lutzomyia genus in the New World (Markle and Markhoul, 2004). Infection can also be blood borne, and can occur following organ

transplantation or transmitted congenitally. VL is endemic in more than 60 countries in tropical and subtropical areas, and in Mediterranean countries; however 90% of the 500,000 new cases that occur every year concern six countries only – India, Bangladesh, Nepal, Brazil, Ethiopia, and Sudan (Maltezou, 2010). VL is caused by *Leishmania donovani* in the Indian subcontinent, Asia and Africa, *Leishmania infantum* in the Mediterranean basin, and *Leishmania chagasi* in South America (Pe´rez-Ayala *et al.*, 2009). In these countries stray and domestic dogs are the main reservoir for infection, and the VL cycle is sustained in well-defined foci by a high (up to 25%) prevalence of canine Leishmaniasis and abundant sand flies (Pe´rez-Ayala *et al.*, 2009). CL is more common in rural areas in settings ranging from rainforests to arid regions; however it is becoming increasingly reported in urban and peri-urban areas of the Old and New World (Maltezou, 2010).

Although ML develops in only a small number of patients with New World CL, its course is chronic and may be life-threatening. Risk factors include poverty, malnutrition, deforestation, and urbanization. In some cases of CL, there are co-infections with human immunodeficiency virus (HIV). The physical effects of Leishmaniasis can range from mild scarring to gross disfiguration and death, so its presence in a community is often very obvious and disturbing.

Materials and Methods

Sample Size

The sample size was determined using the equation described by Naing *et al.*, (2006).

$$N = \frac{Z^2 P (1-p)}{d^2}$$

Where

N - Minimum sample size

Z - The standard normal distribution at 95% confidence interval = 1.96

P - The known prevalence of the infection from a previous study

d - The desired level of precision or significance which is taken as 5% = 0.05.

Using the above formula and the prevalence rate "P" of 25.3%

From a previous study conducted by Igbe *et al.*, (2009).

Therefore;

N =?

$Z = 1.96^2$

$$P = \frac{0.253\ (1-0.253)}{0.05^2}$$

$$N = \frac{1.96^2 \times 0.253\ (1-0.253)}{0.05^2}$$

$$N = \frac{3.8416\ (0.747)}{0.05^2}$$

$$N = \frac{3.8416 \times 0.189}{0.0025} = 290.4 = 290$$

Sample collection

A total of 290 samples were collected, 94 from male and 196 from female in Kanke, Langtang north and south LGA.

Dermal Scraping (conventional)

Tissue juice and flecks of tissues were obtained by scraping the upper dermis (beneath the necrotic lip of the lesion or along the walls of the incisions of the skin), with a sharp instrument. After obtaining the tissue pulp, it was transferred into a clean greasy free slide.

It was teased apart and air dried, fixed in methanol and stained with Giemsa stain 1 in 10 dilution, it was allowed to stand for 1 hour and differentiated with the use of buffer distilled water at pH 7.2. The slide was allowed to air dry. The air dried slide was viewed under the oil immersion objective lense (X100) to detect amastigotes (Velez and Agudelo, 1996).

Blood buffy coat smear

The blood was collected using capillary tube, one side of the tube was sealed with plastaseal and was spined using haematocrit centrifuge at 3000rpm for 5min, the tube was cut in between where the buffy coats and the plasma lies, the buffy coats was placed on a clean greasy free slide and thin film was made, it was allowed to air dry and fixed with methanol and stained with Giemsa's stain for 1hour and buffer distilled water pH 7.2 was used to washed the stained. The slide was allowed to air dry before it was viewed under oil immersion objective lens(x100) to detected amastigote in the macrophages of the cell (Salam *et al.*, 2012).

Statistical Analysis

The data obtained were analysed using Graphpad prism 2010 edition software and the prevalence of the disease was tested using Chi-square.

Results and Discussion

Prevalence of Cutaneous Leishmaniasis among patients attending selected hospitals from Kanke, Langtang north and south local government areas of Plateau State, Nigeria is endemic. The clinical and parasitological prevalence of cutaneous Leishmaniasis by the use of conventional method made it possible to determined the infection responses *in-vivo*, despite the finding by Martins *et al.*, (1998) that the diagnostic role of serology in the diagnosis of CL is limited; the sensitivity and specificity are variable and antibody levels are generally low; yet this study was used to assess level of the illness through clinical symptoms in the three local government areas of Plateau state.

Cases of cutaneous Leishmania (CL) observed in this study among the hospitals were few. This is in agreement with François *et al.*, (2007) who opined that the disease is mostly endemic in the least developed countries in the world.

Table.1 Prevalence of Cutaneous Leishmania among Patients Attending Hospitals in Kanke, Langtang North and Langtang South

Local Government	Number of Subjects Sampled	Number (%) of Positive Samples	Number (%) of Negative Samples	Total
Kanke	114	1 (0.88)	113 (99.12)	114 (100.00)
Langtang North	117	2 (1.70)	115 (98.30)	117 (100.00)
Langtang South	59	1 (1.69)	58 (98.31)	59 (100.00)
Total	**290**	**4 (1.38)**	**286 (98.62)**	**290 (100.00)**
P-value>0.05; Percent values did not vary significantly (Chi-square test $\chi = 0.05$)				

Fig.1 Prevalence of Cutaneous Leishmania among Non-HIV Positive Patients with Lesions in Kanke, Langtang North and South Local Government Areas

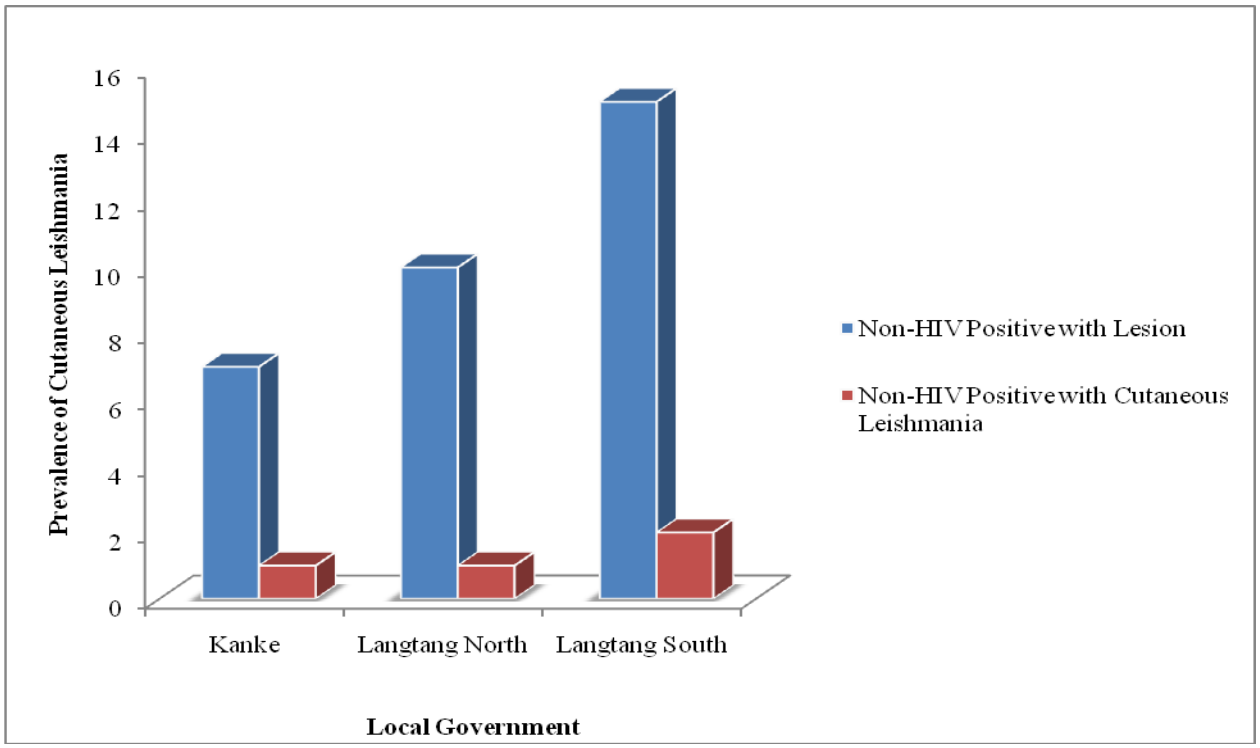
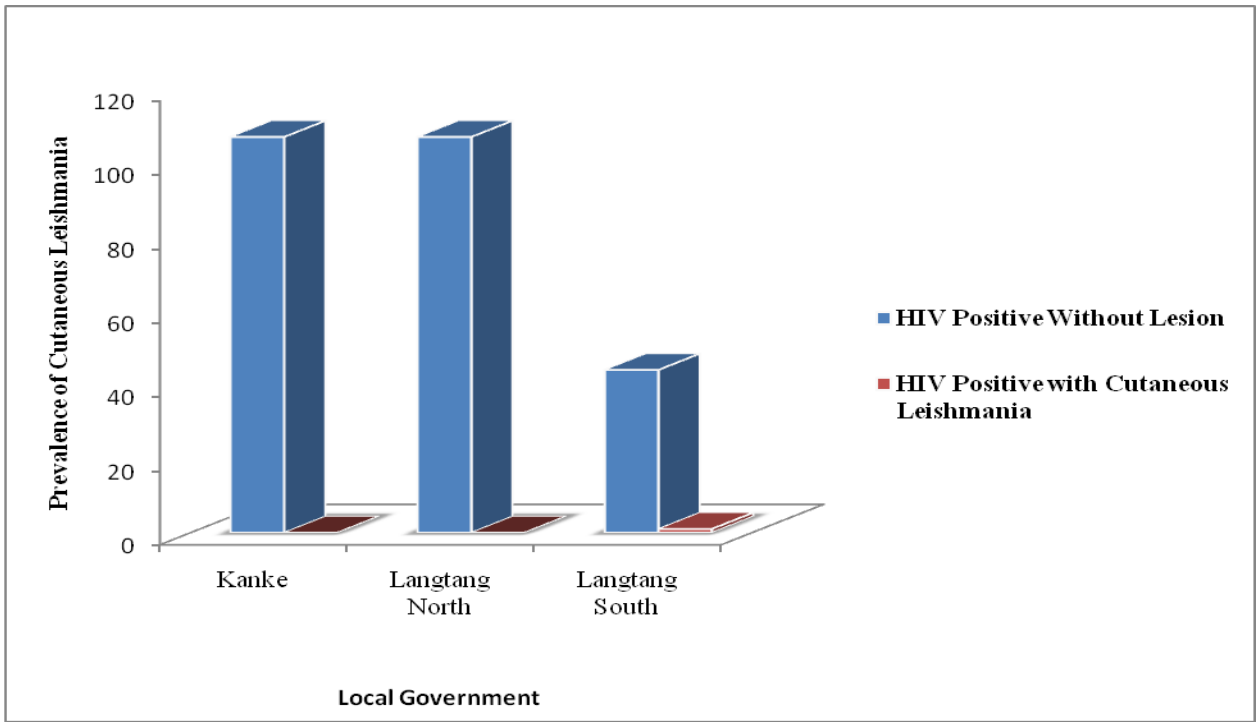


Fig.2 Prevalence of Cutaneous Leishmania among HIV Positive Patients in Kanke, Langtang North and South Local Government Areas



The prevalence of HIV as co-infection of cutaneous Leishmania among patients attending the selected hospitals is significant only in Langtang south local government area of Plateau State. Therefore, there was a statistical significant difference ($p<0.05$) based on prevalence of C.L among HIV positive patients in the three Local Government Areas.The significance of HIV as co-infection of the cutaneous Leishmaniasis among HIV positive patients was in agreement with the research of Markel and Markhoul (2004) who observed an increase of co-infections with human immunodeficiency virus (HIV) and Leishmania during the last 30 years.

It was concluded from findings of this study that positive cases of Leishmaniasis is prevalent in certain parts of the country. It was also established in this study that there is also possibility of co-infection between HIV and leishmianiasis. Preventive measures should be taken by relevant authorities to eradicate this disease.

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