Prevalence Of Cutaneous Leishmaniasis In Relation To Sex And Age Of Patients Attending Hospitals In Kanke, Langtang North And South Local Government Areas Of Plateau State

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Abstract: Investigations were carried out to ascertain the prevalence of cutaneous leishmaniasis in relation to sex and age of patients attending hospitals in Kanke, Langtang north and south Local Government Areas of Plateau state. A total of 290 blood samples and tissue from the upper surface of the body parts were collected for analysis. Conventional method was employed for the analysis of samples. Results showed that 4(1.37%) were positive with leishmania parasites. Out of the 114 samples examined in Kanke L.G.A, 1(0.88%) was found positive for the parasite. Also in Langtang North L.G.A, 117 samples were examined and only 2(1.71%) were found to be positive for the parasites. In Langtang South L.G.A, 59 samples were examined and only 1(1.70%) were found to be positive. Hence, out of the total of 114 samples (36 male and 78 female) collected in Kanke L.G.A, only 1(0.88%) male were found positive for the parasite. Out of a total of 59 samples (20 male and 39 female) collected in Langtang South L.G.A only 1(1.70%) were found to be positive for the parasite, and 2 (1.71%) male out of a total of 117 samples (38 male and 79 female) collected in Langtang North L.G.A. There was statistical significant difference (p<0.05) in the prevalence of cutaneous leishmaniasis based on sex of people examined. The age group with the highest prevalence in this study ranged between 31 – 40 years with 2(2.56%) while other infections of cutaneous leishmaniasis were found among age group 0 – 10 and 41-50 with prevalence rate of 11.11% each. However, quite a wide number of age ranges such as 11-20, 21-30, 41-50 and 51-60 years were tested negative which shows no significant difference (p>0.05) in the prevalence of cutaneous leishmania based on these age ranges of patients examined. If adequate attention is focused on eliminating this disease, it will reduce the spread to a minimum level.

Keywords: Age, Sex, Cutaneous leishmaniasis, Kanke, Langtang North and South

I. INTRODUCTION

Geographical distribution shows that, leishmaniasis is divided into two: Old World and New World leishmaniasis. Infection is transmitted through hematophagus sandflies of the Phlebotomus genus in the Old World and the Lutzomyia genus in the New World (Pavli and Maltezou, 2010). Infection can also be blood borne, and can occur following organ transplantation or transmitted congenitally. There are more than 17 Leishmania species known to infect humans (Maltezou, 2010) 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). In Mediterranean countries and South America the disease is zoonotic and

affects mainly infants and young children (Kafetzis and Maltezou, 2002). Although ML develops in only a small number of patients with New World CL, its course is chronic and may be life-threatening. Leishmania infections in humans are caused by more than 20 species of Leishmania with risk factors. All three types can be diagnosed by seeing the parasites under the microscope (WHO, 2014). In addition, visceral disease can be diagnosed by blood tests (Sundar and Chakravarty, 2013). The physical effects of leishmaniasis is disfiguration and death, so its presence in a community is often very worrisome, causing increased interest is the persistent and deadly epidemic of leishmaniasis (Burki, 2007).

II. MATERIALS AND METHODS

SAMPLE SIZE

The samples size was determined using the equation described by Naing *et al.* (2015).

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

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 = ?

$Z = 1.96^2$

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

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

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

$N = \dfrac{3.8416 \times 0.189}{0.0025}$

= 290.4

= 290

SAMPLE COLLECTION

A total of 290 samples were collected 94 from male and 196 from female in Kanke, Langtang north and Langtanng south Local Government Area of Plateau state.

DERMAL SCRAPING (CONVENTIONAL)

Tissue juice and flecks of tissues was 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 lens (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).

QUESTIONNAIRE

Questionnaires were distributed to patients so as to obtain information on age and sex.

STATISTICAL ANALYSIS

The data obtained were analyzed using Graphpad prism 2010 edition software and the prevalence of the disease was tested using Chi-square.
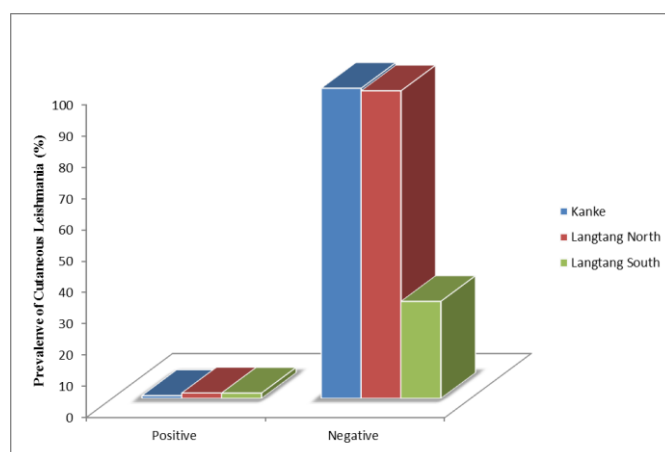
III. RESULTS AND DISCUSSION

Figure 1: Prevalence of Cutaneous Leishmania among Patients Attending Hospitals in Kanke, Langtang North and South
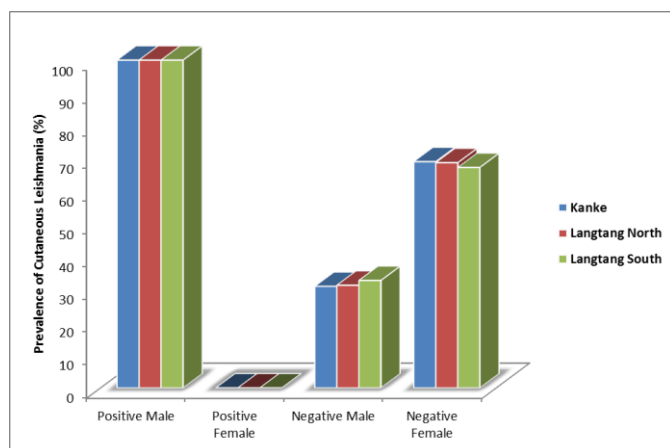
Figure 2: Prevalence of Cutaneous Leishmania Based on Sex of Patients in Kanke, Langtang North and South Local Government Areas

Age (Years)	Number of Subjects Sampled			Number (%) Positive			Number (%) Negative			Total
	Kanke	Langtang North	Langtang South	Kanke	Langtang North	Langtang South	Kanke	Langtang North	Langtang South	
0-10	0	6	3	0 (0.00)	0 (0.00)	1 (33.33)	0 (0.00)	6 (100.00)	2 (66.67)	9 (200)
11-20	10	12	27	0(0.00)	0(0.00)	0 (0.00)	10(100.00)	12 (100.00)	27 (100.00)	49 (300)
21-30	31	30	1	0 (0.00)	0 (0.00)	0(0.00)	31 (100.00)	30 (100.00)	1 (100.00)	62 (300)
31-40	44	33	1	0 (0.00)	2 (6.06)	0 (0.00)	44 (100.00)	31 (93.94)	1 (100.00)	78 (300)
41-50	22	27	6	1 (4.55)	0 (0.00)	0 (0.00)	21 (95.45)	27 (100.00)	6 (100.00)	55 (300)
51-60	5	6	21	0 (0.00)	0(0.00)	0(0.00)	5(100.00)	6 (100.00)	21 (100.00)	32 (300)
61-70	2	3	0	0 (0.00)	0 (0.00)	0 (0.00)	2 (100.00)	3 (100.00)	0 (0.00)	5 (200)
Total	114	117	59	1 (4.55)	2 (6.06)	1 (33.33)	113(595.45)	115 (693.94)	58 (566.67)	290 (1900)

p-value >0.05
Percent values did not vary significantly (Chi-square test χ= 0.05)
Table 1: Prevalence of Cutaneous Leishmania Based on Age of Patients in Kanke, Langtang North and South Local Government Areas

IV. DISCUSSION

Prevalence of cutaneous leishmaniasis among patients attending hospitals in Kanke, Langtang north and south local government areas of Plateau State, Nigeria shows that age group with the highest prevalence ranged between 31 – 40 years with 2(2.56%). While other infections of cutaneous leishmaniasis were observed among age group 0 – 10 and 41-50 with prevalence rate of 11.11% each. However, quite a wide age range within the ages of 11-20, 21-30, 41-50 and 51-60 were tested negative which shows no significant difference (p>0.05) in the prevalence of cutaneous leishmaniasis. Therefore, cases of cutaneous leishmania (CL) observed in this study among the hospitals were few. This is in agreement with Francois *et al.* (2007) who opined that the disease is mostly endemic in the least developed countries in the world. The prevalence of cutaneous leishmaniasis with respect to sex showed that male were more infected than their women counterparts in the three Local Government Areas sampled. Therefore, there was a statistical significant difference (p<0.05) based on prevalence of C.L among sex of patients.

The prevalence of leishmaniasis among male could be due to exposure to farming activities around areas that habours these organisms.

V. CONCLUSION

Based on the analysis of these findings, it was concluded that prevalence of leishmaniasis from the three Local Government Area sampled was higher in male than their female counterparts. Age group 40 to 60 were more susceptible to the infection than other age ranges. Control of this disease should be advocated by appropriate quarters to stop the spread.

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