Cutaneous leishmaniasis: Literature review and report of two cases from communities devastated by insurgency in North-East Nigeria

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INTRODUCTION

Leishmaniasis is a parasitic disease most often as result of bite by infected female phlebotomine sandflies. Various species of sand flies are potential vectors and some 100 species of wild and domestic animals including humans could serve as reservoir hosts.¹ The causative agents are blood and tissue dwelling intracellular protozoan parasite species belonging to the genus Leishmania. Infection with leishmania specie could result in disease condition ranging from chronic but often self-healing skin lesions, cutaneous leishmaniasis (CL), to erosive mucosal membrane destruction of the nasopharynx known as mucocutaneous leishmaniasis, and a life-threatening systemic infection with hepatosplenomegaly in visceral leishmaniasis. The nature and extent of the disease is determined by complex interactions between the infecting species of Leishmania and the immunological status of the host.¹,²

Although the disease has been described from parts of 88 countries in the tropics and sub-tropics where some 350 million are at risk of infection, over 12million affected with some 1.5–2million new cases each year, there is dearth of studies on leishmaniasis in West Africa where the disease is estimated to be endemic, arguably it is a less recognized or under-reported parasitic infections in this region.³ ⁶ The risk of acquisition of leishmaniasis has been reported to increase considerably with human activity; the disease gets into the human population when man, flies and the animal reservoirs coexist in the same environment.⁷ Cutaneous form is the most common presentation of leishmaniasis, its epidemic has been associated with deforestation, road construction, wars, or other activities where humans intrude the habitat of the vector.⁶,⁷ Northeastern Nigeria has been ravaged by the activities of insurgency in the last six years. This has resulted in internal displacement of people from their homes, distortion of ecosystem and increased interaction between humans and vectors. In the light of the above we report two cases of cutaneous leishmaniasis. To the best of our knowledge this report is the first documented cases from our environment.

CASE REPORT 1

A 38yr old military personal deployed to fight insurgency in Mallum Fatori, a Village bordering Niger Republic where the first case of leishmaniasis was detected West Africa in 1915. He presented with ulcerated multiple nodular swelling on the right upper limb and right elbow, the swelling were notice one month prior to presentation and had ulcerated a week before coming to hospital. The ulcer has sloping edge and necrotic floor they measures 4x3 cm and 3x3 cm respectively. Proposed diagnosis of Kaposi sarcoma was made and biopsy of edge of an
ulcer was taken for histology. Diagnosis of cutaneous leishmaniasis was made based on the histology result. He was given caps fluconazole 200mg for six weeks and he responded well. The skin lesion healed completely after six weeks of therapy leaving a tiny scar.

Fig 1: Show cutaneous ulcer at the elbow joint that has rolled edge and necrotic floor

Histology report of case 1
The sections show an ulcerated skin tissue composed of hyperkeratotic, acanthotic and parakeratotic epidermis overlying dense fibrocollageneous dermis with marked chronic inflammatory cells infiltrates. Focal areas of microabscesses and necrosis at the edge of the ulcer are also noted. Giemsa stain shows numerous histiocytes with intracytoplasmic Donovan bodies.

Fig: 2 Photomicrograph of tissue biopsy; show micro-abscess with focal areas of necrosis. H&E (x10)
CASE REPORT 2

27yr old female, who came from a village near Konduga local government of Borno state, Nigeria, the village was ravaged by activities of Boko Haram insurgency that lead all the inhabitant to flee. She presented with three months history of multiple nodular skin lesions on the right thigh and right elbow. There was history of similar cutaneous lesion in the community but we were unable to trace the other suspected cases due to internal displacement. Patient was seen in Microbiology clinic and suspected parasitic infection was made, biopsy from the wound edge was then taken for histology. The result was in keeping with cutaneous leishmaniasis. She responded well had six month therapy with caps fluconazole 200mg given daily.
Histology report of case 2

Fig 5: Photomicrograph of ulcerated skin tissue composed of acanthotic epidermis overlying chronically inflamed dermis with focal area of necrosis. H&E x 10

Fig 6: Giemsa stain show abundant histiocytes composed of intracytoplasmic amastigote indicated by black arrow. X 100

DISCUSSION
Leishman and Donovan working separately in 1903 first described leishmaniasis. Since then it has been characterized into complex species, at least 20 of which has been demonstrated to cause disease in humans. Some species exclusively causes cutaneous, others visceral leishmaniasis, and some both. Cutaneous forms result from infection of macrophages in the dermis, involvement of reticuloendothelial system result in visceral leishmaniasis, a fatal disease condition if left untreated. A third uncommon mucocutaneous
leishmaniasis exist; when the macrophages in nasopharyngeal mucosa is involved. This report focuses on cutaneous leishmaniasis, the most common form of the disease.5-7

The incidence of leishmaniasis is usually associated with rural areas and poverty, it has also adapted to the urban environment. Tropical medicine clinicians are often baffled by the complexities of leishmaniasis by the apparently innumerable possible combinations of different leishmanial syndromes, species, and geographical areas of acquisition of infection, each combination varying by clinical presentation, ease of diagnosis, natural history, and response to therapy. The geographical distribution of leishmaniasis is determined by the species of sand fly vectors, their feeding preferences and capacity to support internal development of specific species of leishmania. Human activities such as deforestation, road construction, wars and other activities that enhances interaction and proximity with the vector has been associated with CL.8,9 The global burden of leishmaniasis is enormous, it has remained stable in the last decade, causing a morbidity and mortality loss of 2.4 million disability adjusted life-years (DALYs) and approximately 70,000 deaths, a significantly high rank among communicable diseases.3-11

The first established case of leishmaniasis in West Africa was reported in Niger in 191112, since then cases have been reported in several nations in the region mostly from Mali13, Nigeria14, Senegal15, Cameroun16 and Gambia.17 Although the disease is also reported to be endemic in West Africa, there is dearth of studies on its incidence, presentation and management. Neither the reservoir animals nor the vectors are well characterized, arguably it is a less recognized or under-reported parasitic infections in this region.14-17 Another contributing factor for under reporting is lack of facility for case identification and self healing nature of CL. However, sporadic reports of CL in epidemiological proportion has increases in the region. Leishmania major has been identified from Mauritania, Senegal, Mali and Burkina Faso. Three zymodermes (MON-26, MON-117, and MON-74, the most frequent) have been found.5

CL is an infection caused by various species of leishmania protozoa. The parasite is transmitted by the bite of phlebotomine sandflies. Sand flies belongs to insect order Diptera (true flies) in the family Psychodidae, two main genera found in West Africa include Phebotomus and Sergentomyia. Anthropophilic West Africa identified sandflies includes P. duboscqi and P. rhodaini in Ghana18,19, P. duboscqi in Senegal20, P. duboscqi in the Gambia21. Different leishmania species cause Old World versus New World (American) cutaneous leishmaniasis. In the Old World (the Eastern Hemisphere), the etiologic agents include leishmania tropica, L. major, and L. aethiopica, as well as L. infantum and L. donovani. The main species in the New World (the Western Hemisphere) are either in the L. Mexicana species complex (L.mexicana, L. amazonensis and L. venezuelensis) or the subgenus Viannia also referred to as L. (V.) braziliensis species complex. In West Africa Leishmania major has been reported from revervoir hosts, vectors and human patients in studies from Gambia, Senegal, Burkina Faso and Mali.22-24 This distribution of leishmaniasis correlates with appropriate vector species, even within a year, reports from studies conducted in West Africa shows that the highest number of cases occur during the raining season implying that transmission may occur at least two months before the rainfall.25-27

The incubation period is two to eight weeks, although longer periods have been noted. CL causes skin lesion begins as an erythematous papule at the site of the sandfly bite on exposed parts of the body. The papule increases in size and becomes a nodule. It eventually ulcerates and crusts over. The border is usually raised and distinct. There may be multiple lesions, especially when the patient has encountered a nest of sandflies. The ulcer is typically large but painless unless there is secondary bacterial or fungal infection.28

Diagnosis of CL depends on the clinical signs, epidemiological information, PCR and culture of infected tissue, or finding the intracellular parasite in biopsy material from the periphery of the lesion. It is not always possible to culture the parasite (gold standard method) since other microorganisms from the wound may infect the culture material and stop
Leishmania growth. Various laboratory methods exist for diagnosis of leishmaniasis-to detect the parasite and identify the leishmania species. Cutaneous leishmaniasis is diagnosed by direct visualization of amastigotes (Leishman-Donovan bodies) from biopsy of suspicious lesion. Invasive laboratory methods specialized culture techniques and molecular methods are available in reference laboratory.4,8-31

Treatment for CL depends on the Leishmania species involved32 and the means available to the hospital. Not all patients require treatment since lesions may heal spontaneously, after approximately 1 year, leaving a skin scar.32 However therapy may be indicated to reduce the risk for mucosal dissemination, accelerate healing of skin lesion, decrease risk for relapse, decrease local morbidity caused by large or persistent skin lesions, decrease reservoir of infection in a locality. Leishmania lesions appear to respond well to local treatment using cryotherapy, thermoderapy or surgical removal, in combination with chemical treatment; mainly meglumine antimoniate or amphotericin B but pentamidine isethionate, paromomycin, and antifungals are also used.33-40 Pentavalent antimony remains the treatment of choice. It is thought to work by inhibition of adenosine triphosphate synthesis. However, antimonials have a high incidence of reversible adverse effects.33 Furthermore, resistance to meglumine antimoniate has been reported in some areas43,44 and it should be used with caution. Certain azole antifungal drugs have activity against leishmania in vitro.43-48 They inhibit the growth of leishmania in culture systems by inhibiting the cytochrome P-450-mediated 14 a -demethylation of lanosterol, blocking ergosterol synthesis, and causing accumulation of 14a -methyl sterols45-48 In the treatment of cutaneous leishmaniasis caused by various species, the clinical effectiveness of theazole drugs has been varied.46-48 Data are limited on the clinical efficacy against leishmania of fluconazole, a triazole antifungal agent available for oral and parenteral administration.47-49 Its excellent safety profile and pharmacokinetic properties make it a suitable alternative therapy for cutaneous leishmaniasis. It has a long half-life, high solubility in water, and a concentration in skin that is 10 times that in plasma. A six-week course of oral fluconazole is a safe and useful treatment for cutaneous leishmaniasis caused by L. major.48,49

CONCLUSION AND RECOMMENDATIONS
CL is should be considered as a possibility of cutaneous lesion especially in inhabitants of communities affected by insecurity in Northern Nigeria. Given the good safety profile of azoles in this anecdotal report an unavailability, high cost and toxicities associated with pentavalent antimony compounds, we advocate the use of azole for the treatment of cutaneous leishmaniasis. We advocate further studies on this disease including but not limited to active case management, surveillance within the health system and mapping. Other measures include entomological surveillance and identification of host in domestic animals.

REFERENCES


