



Buruli Ulcer (*Mycobacterium ulcerans* infection) in Nigeria: an update on the disease burden in Nigeria

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Abstract:

Buruli ulcer is a disease caused by the bacterium "*Mycobacterium ulcerans*". Buruli ulcer is endemic in Nigeria and has been listed among the neglected tropical diseases causing skin infections. The disease can be very destructive as it can damage the tissues leading to disfiguring and contracture. Buruli ulcer has been recorded in about 33 different countries with certain regions of Africa being the worst affected. In Nigeria, Buruli ulcer is largely unknown to many, including the elite class. Many see the infection as witchcraft, cancer, and or treatment that doesn't require a hospital visit. Since the first case of Buruli ulcer in Nigeria in the year 1967, to date 51 Buruli ulcer cases have been documented. According to the 1998 Cote d'Ivoire conference of the WHO held in Yamoussoukro, all heads of state and representatives of all the Buruli ulcer affected countries, recognized Buruli ulcer as a disease of which little was known about its biology, accurate means of transmission as well as reliable prophylaxis or chemotherapeutic agents. As a manner of utmost importance, there is a need for Nigeria and other countries where Buruli ulcer infection is endemic to rise to the task to curtail or eradicate Buruli ulcer disease. This research is set to highlight the burden of Buruli ulcer in Nigeria as well as proffer some insight as to how the infection can be curtailed or eradicated in Nigeria.

Keywords: buruli ulcer; mycobacterium ulcerans; Nigeria; neglected tropical diseases; skin infections; disfiguring; contracture

1.0 Introduction

Buruli ulcer is a skin and soft tissue infection caused by *Mycobacterium ulcerans*. Infection caused by this pathogen can be very destructive as it can damage the tissues leading to disfiguring and contracture [1].

Centre for Disease Control (CDC) described Neglected tropical diseases (NTDs) as group of infectious diseases that dwell and predominate sub-tropical and tropical regions, affecting poor populace living in less and or poor hygienic environments, and other people who do not have access to water, and mingling with agents of infections (vectors and livestock). Such communities are further defined by their inadequacy to sustainable healthcare facilities [2, 3].

Buruli ulcer is listed among the neglected tropical diseases (NTD's) causing the neglected tropical skin disease (Buruli ulcer).

The discovery of BU was first made in 1897 in Uganda by Sir Albert Cook (Cook, 1897), the work was preceded in 1930s by Australian scientist who cultured the acid-fast bacilli from lesions of in Bairnsdale District in Southern Australia, where the disease was initially referred to as Bairnsdale ulcer. The name 'Buruli' comes from an area of Uganda where many cases were reported in 1960s [4].

According to the data reported by the effected countries to the World Health Organization, a total of 23,206 confirmed cases were recorded from 2010-2017, while in 2017, a short decline was observed with total recorded cases of 2,217 [5]. However, this decline was thought to be seen only in the WHO reported cases. However, other local epidemics continue to go unreported with high cases mostly in the rural areas [5].

Since 1967, Buruli ulcer have been regarded as an endemic infection in

Nigeria. Despite many years of the detection of the first case of Buruli ulcer in Nigeria, there isn't enough epidemiological data and the means of spread, the most affected population, as well all the states affected. Among the few studies conducted in Nigeria, focus has been much in the South western Nigeria, with few or no studies conducted in Northern Nigeria. This has resulted to lack of adequate data on the disease burden. This is further complicated by the absence of designated facility meant for the diagnosis and treatment of Buruli ulcer [6].

Buruli ulcer has been recorded in about 33 different countries with certain regions of Africa been the worst affected. Buruli ulcer has no age restrictions. The disease is caused by *Mycobacterium ulcerans*, a soil and or aquatic dwelling bacteria. Buruli ulcer is known to infect bot humans and animals causing a highly persistent open wound infection. Among the immunocompromised individuals, *M. ulcerans*, is regarded as the third most common mycobacterial infections after tuberculosis and leprosy, contributing to the high mortality caused by the *Mycobacterium* spp. [7, 6].

According to the 1998 Cote d'Ivoire conference of the WHO held in Yamoussoukro, all heads of state and representatives of all the Buruli ulcer-affected countries (Figure 1), recognized Buruli ulcer as a disease of which little was known about its biology, accurate means of transmission as well as reliable prophylaxis or chemotherapeutic agents. It was further recognized as a damaging disease with grafting or amputation as the only means of curtailing its spread [1].

Like other *Mycobacterium* spp. such as *Mycobacterium leprae*, and *Mycobacterium tuberculosis*, which has proven susceptible to most



antimycobacterial agents, the case of *M. ulcerans*, appeared different [8]. Some pilot studies in Africa, including the one conducted in Ghana, sponsored by the WHO have shown the efficacy of streptomycin and rifampicin as an effective drug for treating early Buruli lesions, this might perhaps add to WHO evidence leading to the recommendation on the use of these drugs as part of the WHO provisional advice on the containment of Buruli complications [9, 10]. The use of clarithromycin in combination with rifampicin when taken orally, has proven promising as reported by many pilot studies conducted in the most Buruli ulcer endemic region of Africa [7, 11].

There is evidence that BU is gradually increasing in some countries and reducing in other places and so its geographic spread, As of 2021, there was a report of new cases of BU from 11 countries with 1370 and 291 cases from the African continent and Western Pacific region respectively [12]. In west Africa particularly, BU is now apprehended as a conspicuous disease that exerts a high state of distress and affliction on healthcare facilities and the affected populace [13].

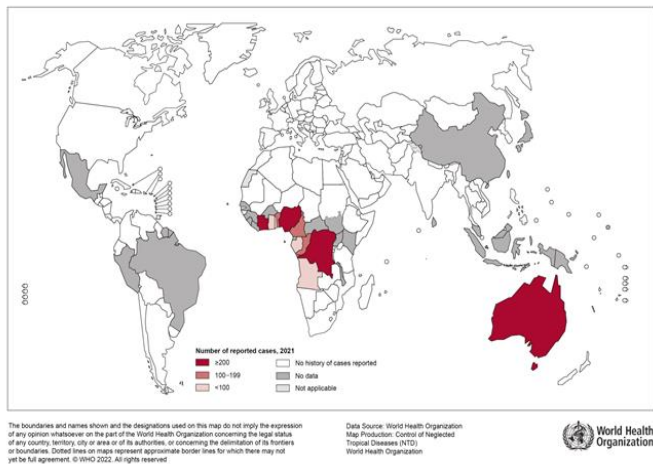


Figure 1: Global distribution of Buruli Ulcer -2021 [12, 2].

2.0 Statement of the Research problem

Since the first case of Buruli ulcer in Nigeria in the year 1967, to date 51 Buruli ulcer cases have been documented [6]. Buruli ulcer is endemic in many African countries with Nigeria inclusive. In Nigeria, there is the belief that many cases in both rural and urban areas go unreported. In Africa, Buruli ulcer caused by *Mycobacterium ulcerans* is considered a serious public health problem, predominantly in tropical countries because of its easy spread. The challenges caused by this pathogen are doubled by the fact that it affects all ages, with children and adolescents as the main vulnerable group [10, 1].

In Nigeria, Buruli ulcer is largely unknown to many, including the elite class. Many see the infection as witchcraft, cancer and or treatment that doesn't require a hospital visit. For these, many of the infections continue to go unnoticed by healthcare professionals. Surveillance of the disease is usually poor and underreporting is widespread because the disease burden is found mostly in Poor rural communities and sub-Saharan Africa [4]. This problem is compounded by the absence of any single antimicrobial drug or vaccine solely designated for the treatment of Buruli ulcer [12]. In addition to this, the weak nature of many health institutions in Nigeria has added to the disease burden.

3.0 Justification of the study

Several studies have shown the impact of community sensitization, and disease surveillance on the containment of similar infections. It for on this bases that this study set conduct a community sensitization campaign, pathogen surveillance and antimicrobial susceptibility testing with a view to observe the susceptibility pattern of the pathogen (*M. ulcerans*). Considering, the paradigm shifts in the treatment of Buruli ulcer in the past decades, there is the need to test the efficacy of many plant extracts that have been utilized locally in the treatment of Buruli ulcer as well as similar complications.

4.0 Means of the spread of Buruli ulcer infections and their characteristic complications

A given transmission pathway for *M. ulcerans* has not been perfectly defined. However, considering the pathogen environment, recent evidences suggest that Buruli ulcer is transmitted via contact with contaminated water. Following this contact, the bacteria find its way to

the body through traumatic injuries, and or abraded skin. However, other unconfirmed reports suggest their possible transmission via insects. Several studies have shown the presence of *M. ulcerans* gene in domestic animals, mosquitoes and aquatic insects [5].

The disease is characterized by systemic infections, which may result in secondary infection leading to tetanus or sepsis eventually leading to severe complications and death. Extensive skin damage may lead to excisional surgery, blindness, contractures of the limb adding more of its health and economic burden [11]. Buruli ulcer shows a characteristic sign such as; edema, plaque, and non-ulcerative nodule and may ulcerate within 4–6 weeks of infection [5, 11].

5.0 Conclusion

Buruli ulcer (*Mycobacterium ulcerans* infection) is endemic in Nigeria. The disease is listed among the neglected tropical diseases. Buruli ulcer is destructive as it can damage the tissues leading to disfiguring and contracture. Although a short decline in the disease occurrence was observed over the years globally, researchers are of the believe that in many developing countries like Nigeria, the decline can be attributed to the low level or absence of any surveillance techniques that coordinate the surveillance and report of this disease, exactly like other similar diseases. More so, many cases of Buruli ulcer infection happening in rural areas are largely unreported mainly due to the absence of hospitals and other primary health care centers. This is coupled with cultural beliefs by many people, as they believe that Buruli ulcer disease is as a result of spiritual attack or witchcraft. This problem is compounded by the absence of any single antimicrobial drug or vaccine solely designated for the treatment of Buruli ulcer. For these reasons, there is a need for Nigeria and other countries where Buruli ulcer infection is endemic to rise to the task to curtail or eradicate Buruli ulcer disease.

References.

1. [P. D. R. Johnson\(2020\), "Buruli ulcer: cured by 8 weeks of oral antibiotics?," Infectious Diseases Department, Austin Health, and University of Melbourne, vol. 20, pp. 30519-5.](#)
2. [CDC and C. f. D. C. a. Prevention.\(2022\), "Neglected Tropical Diseases \(NTDs\)."](#)
3. [P. . Hotez.\(2013\) "Forgotten People, Forgotten Diseases: The Neglected Tropical Diseases and Their Impact on Global Health and Development," ASM Press: 2nd ed.; Washington, DC, USA.](#)
4. [CDC and W. H. Organization,\(2022\) "Buruli Ulcer \(Mycobacterium infection\)."](#) a.
5. [T. F. Omansen, A. Erborow-Becksen, R. Yotsu, T. S. v. d. Werf, A. Iendrebego, L. Grout and K. Asiedu,\(2019\) " Global Epidemiology of Buruli Ulcer, 2010–2017, and Analysis of 2014 WHO Programmatic Targets." Emerging Infectious Diseases, vol. 25, no. 12, p. 2183.](#)
6. [E. Marion, K. Carolan, A. Adeye, M. Kempf, A. Chauty and L. Marsollier.\(2015\) "Buruli Ulcer in South Western Nigeria: A Retrospective Cohort Study of Patients Treated in Benin." PLOS Neglected Tropical Disease, vol. 9, p. e3443.](#)
7. [O. DP, M. A and e. a. Callan P. \(2012\)"Successful outcomes with oral fluoroquinolones combined with rifampicin in the treatment of Mycobacterium ulcerans: an observational cohort study.," PLoS Negl Trop Dis ,vol. 6, p. e1473.](#)
8. [E. DK, D. G and D. I. e. al. \(2002\)"A pilot study of treatment of Buruli ulcer with rifampin and dapsone.," Int J Infect Dis ,vol. 6, p. 60–65.](#)
9. [E. S. C. B and e. a. Grosset J.\(2005\) "Efficacy of the combination rifampin-streptomycin in preventing growth of Mycobacterium ulcerans in early lesions of Buruli ulcer in humans.," Antimicrob Agents Chemother, vol. 49, p. 3182–86.](#)
10. [WHO. \(2004\) "Role of specific antibiotics in Mycobacterium ulcerans \(Buruli ulcer\) management provisional guidelines."](#)
11. [C. A. A. MF and e. a. Marsollier L.\(2011\) " Oral treatment for Mycobacterium ulcerans infection: results from a pilot study in Benin.," Clin Infect Dis, vol. 52, p. 94–96.](#)
12. [\(WHO\) and W. H. Organization, \(2022\)"Buruli ulcer: Global Health observatory.," Neglected Tropical Diseases.," b.](#)
13. [S. v. d. Werf, Y. Stienstra, R. C. Johnson, R. Phillips, O. Adjei, B. Fleischer, M. H. Wansbrough-Jones, P. D.R, J. F. Portaels, W. T.A, v. d. Graaf and K. Asiedu. \(2005\)"Mycobacterium ulcerans Disease." Bulletin of the World Health Organisation. https://edoc.unibas.ch/523/1/DissB_7700.pdf https://edoc.unibas.ch/523/1/DissB_7700.pdf](#)



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