



**BURULI ULCER (*ACHA ERE*) INFECTION: KNOWLEDGE, ATTITUDE AND PRACTICES AMONGST BURULI ULCER PATIENTS IN UZUAKOLI, BENDE LGA**

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**ABSTRACT**

*Mycobacterium ulcerans* causes a chronic, debilitating necrotizing disease of the tissue and skin called *Buruli ulcer*. It leads to social stigmatization amongst its patients. This study was designed to investigate the prevalence of leg ulcer and knowledge, attitude and practices of Buruli ulcer patients in Uzuakoli, Abia Nigeria. One and fifty (150) suspected leg ulcer patients were examined for Buruli ulcer using Zeihl-Nelson stain method and gram staining method to detect organisms present. Four different microorganisms were identified, out of the number analyzed, 18 (12.0%) comprising 6 (33.3%) males and 12 (66.6%) females were infected with Buruli ulcer. The females had the highest infection rate and were significant ( $p < 0.05$ ). The infection rate was highest amongst patients of the age group 41 – 50years (66.6%) while those between age of 1 – 10years, 11 – 20years, 21 – 30years showed low infection rate though the age related prevalence was not significant statistically ( $P > 0.05$ ). Patients whose occupations were farming showed high infection rate of 4 (66.6%) while those who are civil servants showed low infection rate. There is need to create more awareness mainly via health education on the causes, prevention and control of Buruli ulcer.

**KEYWORDS:** *Buruli ulcer*, Stigmatization, Knowledge, Attitude, Practices.

**INTRODUCTION AND LITERATURE REVIEW**

Buruli ulcer (BU) caused is amongst the neglected diseases of the tropics. It is caused by *Mycobacterium ulcerans*. Buruli ulcer is more prevalence in the rural areas (Onwuchekwa *et al*, 2019). BU infection is destructive to the skin and other soft tissues presenting a large limb ulcer. Patients of BU are usually common in Africa and Australia (Guerra *et al.*, 2008). BU is the third most common mycobacterial disease of the immunocompromise host after leprosy and tuberculosis and it primarily affects people of age group 4 to 60years and above (Shannon and Williams, 2017).

BU infection leads to permanent disfiguration and disability if untreated in more than a quarter of the patients (Asiedu, 2017). Studies have shown that BU is common among people living near the rivers, swamps and wetlands. Few cases of BU have been documented in Nigeria. In 1976, 24 cases of BU were reported in Oyo State Nigeria, in 2006, 14 cases were reported in some southern states of Nigeria while in 2012, Anambra, Ebonyi and Cross River States recorded 9 cases each (Ukwaja, *et al.*, 2016). Several cases of Buruli ulcer in Nigeria are being treated in the Traditional /Herbal homes which makes it a little difficult for its prevalence to be ascertained. It originally emerges as a painless dermal papule or subcutaneous oedematous nodule

which breaks down to form an extensive neurotic ulcer with undermine edges over a period of weeks to months. The *Mycobacterium ulcerans* (MU) are slow growing mycobacteria which produces a soluble polykediteexo-toxin called mycolactone which are able to diffuse deeply in the subcutaneous tissues. Due to its immunosuppressive and cytotoxic properties, there is high rate of tissue dysfunction without inducing inflammation or symptoms such as fever, malaise or adenopathy. The organism that are known to be the causative agents was first described by Sir Albert Hook in patients from Buruli country in Uganda and the causative organisms was isolated in 1948 by MacCallum who discovered an acid-fast bacilli in a biopsy from a leg-ulcer in a child from Bairnsdale region of Victoria, Australia in 1940. A reemergence of causes led the 1998 WHO to reclassify Buruli-Ulcer as a neglected emerging infectious disease. The history of BU in Africa has many publications before 1980 and after 1980 in countries like Nigeria, Ghana, Gabon, Congo. Where Uganda a group known as Uganda Buruli group studied in the epidemiological and clinicopathological aspects of the disease and termed it Buruli Ulcer which was because large number of cases were first and famously dedicated in the district of Buruli near lake Kyoga and also the information and facts about BU in Congo was articulated by Janssens in 1972 and Meyers in 1974 (WHO, 2005).

**Epidemiology:** These diseases that are caused by *Mycobacterium ulcerans* (M.u) have been suggested to be present in ground water and a nutrient rich environment may favour its survival and growth also the (M.u) are able to colonize man-made reticulum systems and are likely to be spread by aerosol. BU have been reported in 33 countries where the highest endemic causes recorded so far occur in countries in central and western Africa which include Cameroon, Nigeria, Togo, Liberia, Benin. In Nigeria, it has occurred among Caucasians living on campus of the University of Ibadan after 1965 when a stream was dammed for an artificial lake (WHO, 2005).

From epidemiological and biological findings, it is noted that environmental factors, it is noted that environmental factors plays an important role in the survival of the causative agent. It is also noted that outbreaks have followed human migration, man-made topographical modification such as dams and resorts, deforestation and increased basic agricultural activities.

In several places the disease has not been well considered as a public health problem with reasons which include that Buruli Ulcer are not notifiable

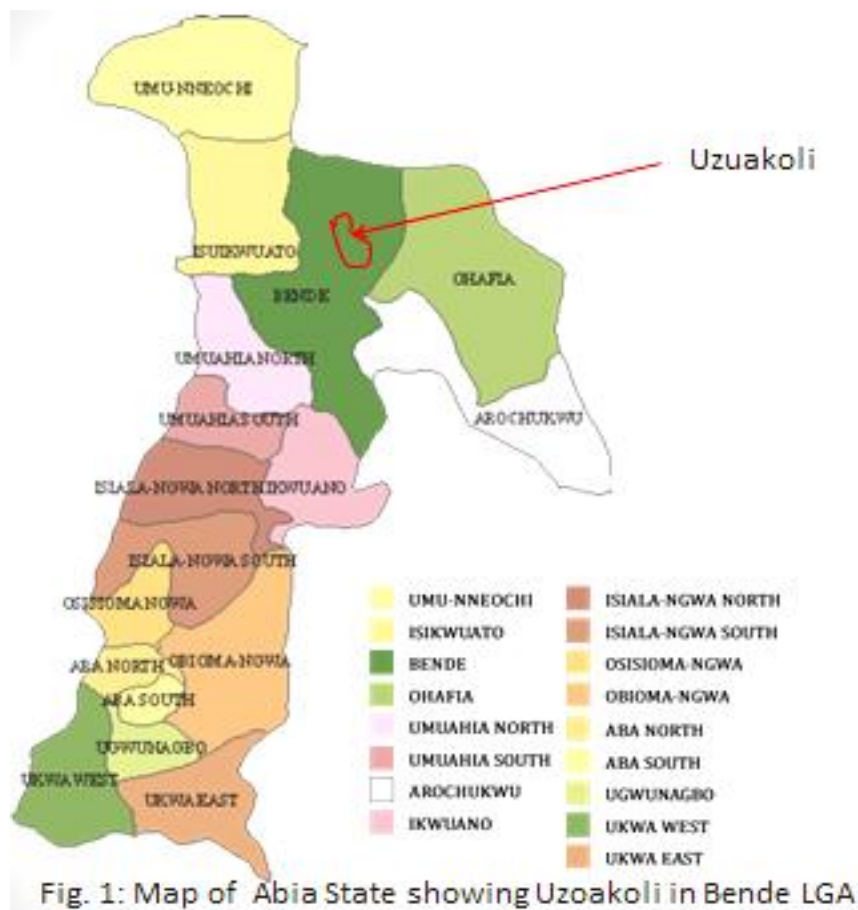
diseases and also in some places where this disease occurs, patients receive care from traditional healers or from voluntary mission, health care centres which then makes the disease not to come to the attention of the ministries of health.

**Modes of Transmission:** The disease is known to occur often in close proximity of water bodies, but no specific activities that bring people into contact with water have been identified (i.e fetching of water fishing, washing and bathing).

The mode of transmission of Buruli Ulcer is not entirely known, where recent evidence suggests that insects may be involved in the transmission of the infection. These insects are aquatic being belonging to the genus "Naucorir" family (Naucoridae) and Diplomyceur family (Belostomatidae).

Trauma is the most frequent means by which *M.ulcerans* is introduced into the skin from surface contamination the initial trauma can be as slight as a hypodermic needle puncture or as severe as gunshot or exploding land mine wounds while Epidemiological evidence has not clearly supported person to person transmission (WHO, 2005).

### Study Area



**Data Collection:** This was based on the administration of questionnaires and collection of biopsy samples from the neurotic base of the lesion in patients of leg ulcers.

**Administration of Questionnaires:** A descriptive survey of patients was done using questionnaires to obtain information such as age, sex, occupation, height, knowledge, attitude and practice on Buruli ulcer.

**Samples Collection:** Using a sterile swab sticks, swabs were collected from different necrotic base of lesions from 150 leg ulcer patients within Uzuakoli, Bende L.G.A, Abia State and these samples were taken immediately to Medical / Public Health Parasitology and Entomology Laboratory Unit of Abia State University Uturu for bacteriological analysis. Smears obtained by swab were prepared with materials from the necrotic base and undermined edges of the lesions and were stained with Ziehl-Neelson and was inoculated onto Lowenstein-Jensen medium.

**Bacterial Isolation and Identification:** All the biopsy samples collected was cultured in sterile Petri dish plates using the prepared media for the bacteria cultivation. The plates were incubated at 37°C for 18-24 hours. The isolates of *E.coli*, *staphylococci*, *pseudomonas* and *Mycobacterium ulcerans* species obtained was characterized and identified based on their motility,

microscopic and colonial morphologies, Gram staining reaction, biochemical tests which include; catalase, citrate test, indole test, oxidasetest, and urease test, as described in medical laboratory manual for tropical countries with reference to the Bergey's manual of systemic bacteriology (Cheesebrough, 2005). Smears were prepared and examined microscopically with oil immersion at x100 objectives (Chessbrough, 2005).

## RESULTS

Out of 150 samples examined, 18 were infected with *Mycobacterium ulcerans* representing 12%, 60 representing 40% were infected with *pseudomonas*, 42 representing 28% were infected with *E.coli* and 30 representing 20% were infected with *Staphylococci* (Table 1). The result was not significant ( $p > 0.05$ ,  $Z_{cal} = 1.72$ ,  $Z_{tab} = 1.96$  and  $1.96$ ). Patients aged within 11-20years and 21 – 30 years were not infected while age groups 31 – 40years and 41-50years were infected representing 33.3% and 66.6% respectively (Table 2). The result was significant ( $p < 0.05$ ,  $Z_{cal} = 7.05$ ,  $Z_{tab} = 1.96$  and  $1.96$ ). Table 3 shows that in all 12 (16.6%) patients are farmers, while traders and students were 3 each. The result shows a significant different ( $p < 0.05$ ,  $Z_{cal} = 4.8$ ,  $Z_{tab} = -1.96$  and  $1.96$ ). In all, females were infected more than the males as shown in Table 4. The result was significant ( $p < 0.05$ ,  $Z_{cal} = 11.14$ ,  $Z_{tab} = 1.96$  and  $1.96$ ).

**Table 1: Prevalence of infection based on organism present.**

Organism present	No. of biopsy sample	Percentage infection (%)
Mycobacterium ulcerans	18	12%
Psuedomonas	60	40%
E. coli	42	28%
Staphylococci	30	20%
Total	150	

**Table 2: Prevalence based on Age-groups.**

Age (years)	No of samples examined	No of samples infected with MU	% infection
11 – 20	6	0	0
21 – 30	9	0	0
31 – 40	30	6	20
41 – 50	90	12	13.3
51 and above	15	0	0
Total	50	18	12

**Table 3: Prevalence of infection based on occupation.**

Occupation	No of samples examined	No of samples infected with MU	% infection
Farming	75	12	16.6
Trading	30	3	10
Student	15	3	20
Civil servant	30	-	-
Total	150	18	12

**Table 4: Prevalence of infection based on gender.**

Gender	No of samples examined	No of samples infected with MU	% infection
Male	54	6	11.1
Female	96	12	12.5
Total	150	18	12

**DISCUSSION AND CONCLUSION**

Prevalence of leg ulcer was carried out among leg ulcer patients aged 11 to 51 years in Uzuakoli, Bende LGA, Abia State. The total number of patients with leg ulcers in the study area were 150, out of which Buruli ulcer had 12% prevalence. Four organisms responsible for different infections were also identified which include *Mycobacterium ulcerans*, *Pseudomonas aeruginosa*, *Escherichia coli* and *Staphylococci aureus species*. The gender-related prevalence shows that infection was significantly higher in females than their male this higher infection rate in female could be as a result that females in the study areas are mostly farmers who often go to farm frequently on bare foot and always come in contact with soil and water environment especially stagnant water which is similar to a study by Guerra *et al.* (2008), in Amazon River Basin where people living around the area are related to frequent contact with contaminated water for domestic activities and was observed to have the infection more than other people.

The prevalence of Buruli ulcer infection based on occupation is a basic factor that can influence the prevalence of the causative organisms, farmers were significantly infected compared to other occupations such as traders, students, civil servants; those who are farmers show high infection rate of 12 (16.6%) while those who are civil servants show a no infection rate. This could be as a result of having close contact and walking barefooted at their farming site which could be contaminated with high microbial deposition in the soil and other environmental pollutants as recorded by Shannon and Williams (2017), and Onwuchekwa *et al.* (2019) which states that people who engage in some agricultural activity and have high close proximity to water are liable to come in contact to the causative agents of Buruli ulcer than non-agricultural practitioners.

However, no or less emphasis and sensitization hygiene are the main reasons why people are at high risk of contacting these organisms in rural areas. Also, the knowledge of Buruli ulcer in the study area was minimal and based mainly on diabolic means which it is said to be caused through witchcraft and they believe that the causative agent has no medical relationship and the only treatment option considered most appropriate was traditional with herbs which could be as a result of lack of standard hospitals and qualified medical practitioners in the area, and also lack of basic infrastructure and poor governmental aid to the endemic areas. Good sensitization of Buruli ulcer by stakeholders will go a long way in eradicating this debilitating disease.

More also, patients receive care from traditional healers or from voluntary mission healthcare centres which may be one of the reasons why the disease has been given little or no attention by the Health systems in Nigeria. Based on the organisms found in the 150 samples examined, it was observed that only 18 samples gave a positive result which then justifies that most leg ulcers termed Buruli ulcer “*Acha ere*” as popularly known are not what they are known to be. That is to say that Buruli ulcer is a leg ulcer but not all leg ulcers are Buruli ulcer.

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