The Mysteries of Buruli Ulcer in the African Region: Causes, Symptoms, and Treatment.

By: Wai Phyo Thant, Lydia Nobert, and Serge Bataliack

Buruli Ulcer (BU) affects the skin and bones of humans and causes permanent disfigurement that leads to long-term disability and stigma associated socioeconomic burden. It starts as a painless swelling (nodule), a painless area of induration (plaque), or a diffuse, painless swelling of the legs, arms, or face (oedema). It progresses silently with no pain or/and fever. Sometimes, these areas burst (ulcerate) within four weeks with/without antibiotics. When it goes deeper, the bone is affected and causes deformities, i.e., it cannot do its functions.

Causes of Buruli Ulcer

Buruli ulcer is a skin disease caused by a bacteria called Mycobacterium ulcerans. It begins as a tiny bump but can rapidly damage your skin if not treated promptly. The bacteria's toxin leads to skin loss. Detecting it early and using antibiotics are vital for effective treatment. People affected by BU are frequently discovered near sluggish or stagnant bodies of water, where Mycobacterium ulcerans exists in aquatic insects, molluscs, fish, and the water itself. The mode of transmission to the human body remains uncertain.

source: Left Photo from WHO, right photo from Wikipedia

Categories of Buruli Ulcer

The disease is divided into three categories based on how severe and big the tissue damage (lesions) is:

- Single small lesion: This type has a size of less than 5 cm in diameter and is found in 32% of all cases.
- Non-ulcerative, ulcerative plaque, oedematous forms: This type has a size ranging between 5 to 15 cm in diameter and makes up 35% of all cases.

- Large lesions: This type has a size larger than 15 cm in diameter and is either disseminated and mixed forms with osteomyelitis and bone joint involvement, or found at critical sites like the head, breast, or genitalia. It is found in 33% of all cases.

Most of the time, the disease is found in the lower limbs of the body (55%), followed by 35% in the upper limbs, and the remaining 10% in other body parts. Because it is most common in the lower limb areas, healthcare workers might mistake them for other causes of ulcerations, such as diabetes or blood vessel insufficiency lesions.

Disease burden in the African Region

Over 90% of global cases are documented in the African Region, with children under the age of 15 years constituting nearly 50% of those affected. According to the most recent fact sheet for the African Region, 13 out of its 47 Member States are considered endemic. Notably, there was a significant decrease of 64% in reported cases within the African Region, with only 1370 BU cases recorded in 2021 compared to the 3845 cases reported in 2011.

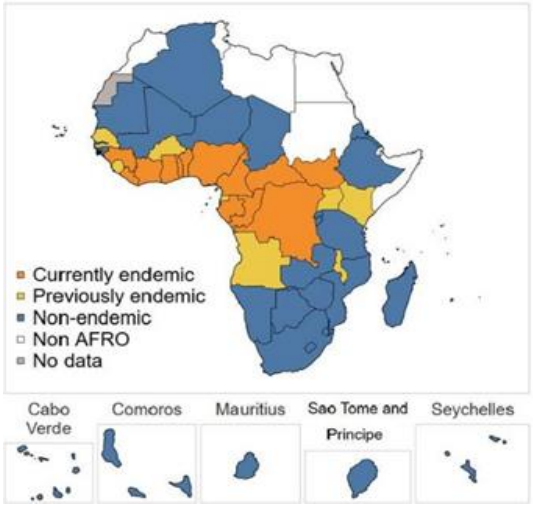

Figure 1. Buruli Ulcer endemicity in the WHO African Region, 2021

Diagnosis of the Buruli Ulcer disease

The diagnosis can be challenging for basic health workers because early lumps look like other skin wounds as shown in the first image above such as insect bites, boils (pus-filled bump), lipomas, ganglions, lymph node tuberculosis, onchocerciasis nodules, or deep fungal subcutaneous infections. Cellulitis with swelling (oedema) might be mistaken for a Buruli ulcer. Diagnosis with a laboratory test is one of the procedures. Standard laboratory methods are applied for confirmation of Buruli ulcer.

Treatment of the Disease

Treatment depends on a timely and accurate diagnosis. Early-stage infections can be treated with antibiotic combinations, such as those of rifampicin, streptomycin, and clarithromycin. Late cases may require surgical procedures for wound debridement and skin grafting, and lymphoedema management to faster healing, resulting short hospital stay. Physiotherapy might also be required for patients with restricted movement.

Disease prevention

Since the mode of transmission is unknown, there are no definitive prevention measures yet. Bacillus Calmette-Guerin (BCG) vaccination may provide limited protection. Early detection followed by full course antibiotic treatment can minimize the chances of disability and prevent the severe disease stage.

Scientific research is prioritizing to understand transmission to humans, rapid diagnostic tests production to get early diagnosis, and best-case (effective) antibiotic treatment for infected individuals, especially for those with HIV infection who are co-infected with BU.

WHO Response on Buruli Ulcer

- In 2019, WHO organized the Buruli ulcer laboratory network for the African Region to strengthen PCR laboratory confirmation in endemic countries. Since thirteen laboratories are participating in this network, the sample can be sent to those laboratories to get PCR-confirmed test results of the Buruli ulcer.
- WHO not only offers technical support but also develops policies, guidelines, standard recording and reporting forms, health promotional materials, and coordinates control and research efforts.
- To assist health workers in the field with diagnosing skin NTDs, including Buruli ulcer, WHO has designed online courses and a user-friendly Skin App available for both Android and iOS platforms.
- Regularly convening all major stakeholders involved in Buruli ulcer, WHO fosters information sharing, disease control coordination, research efforts, and progress monitoring.
- Concurrently, WHO's support extends to three essential research priorities: understanding the mode of transmission, developing rapid diagnostic tests, and establishing best-case antibiotic treatments.
- Moreover, WHO ensures free-of-charge access to treatment for all patients in endemic countries by providing antibiotics.
- To promote efficiency, sustainability, and scalability, WHO advocates integrating Buruli ulcer control within a skin NTDs approach tailored to the diseases prevalent in each country.

References

Buruli ulcer (who.int)
Buruli ulcer (Mycobacterium ulcerans infection)
WHO, 2023, Buruli ulcer
Latest iAHO Buruli Ulcer Regional Factsheet