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RESEARCH

Emergence of mpox in Sierra Leone: investigating the index case, January 2025

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Mpox is a reemerging zoonotic disease caused by the monkeypox virus (MPV) and continues to pose a serious global health challenge. In January 2025, Sierra Leone confirmed its first case in the Western Area Rural district, which marked a significant moment in the nation's public health response. This report describes the clinical, epidemiological, and laboratory investigation of the index case, a 27-year-old male from Hamilton, as well as the actions taken to contain the disease. A rapid response team (RRT) was activated following World Health Organization (WHO) protocols, including the use of WHO case investigation forms, line-listing of cases and contacts, laboratory confirmation using polymerase chain reaction (PCR), genomic sequencing, contact tracing, isolation of high-risk contacts, daily monitoring for 21 days, risk communication, and community engagement. The patient was confirmed to have mpox clade IIb and recovered fully after isolation and medical care. Nine close contacts were identified, monitored for 21 days, and none developed symptoms. Although the exact source of infection was not identified and the findings suggest possible links to close human contact and recent travel during the incubation period. This case emphasizes the importance of early detection, effective surveillance, timely isolation, and clear communication in responding to emerging infectious threats. It also shows the need to protect patient confidentiality and address stigma, which are important for maintaining community trust and cooperation. The report provides valuable guidance for strengthening outbreak preparedness and response in Sierra Leone and other areas confronting mpox and similar infections.

Keywords: mpox, Sierra Leone, outbreak investigation, public health response, emerging infectious diseases

Introduction

Mpox is a zoonotic disease caused by the monkeypox virus (MPV), a genus of the *Orthopoxvirus* genus, endemic to small animals like rodents, squirrels, and primates. It is now recognized as a significant human ailment (1). The virus is divided into two clades: clade I (comprising subclades Ia and Ib) and clade II (comprising subclades IIa and IIb) (2). Clade

I infections have higher severity, with near-10% fatality rates, while clade II infections have survival rates exceeding 99% (3, 4). The incubation period is 7–21 days, followed by a prodromal phase lasting 2–4 days.

Illnesses often resolve within 2–4 weeks. Transmission can occur prior to the onset of the rash, and infected individuals remain contagious until the lesions have completely healed, which may take up to 4 weeks. The virus is known to survive on infected surfaces for up to 2 weeks, especially in dry and hot conditions (5).

Transmission among humans primarily happens by direct contact with lesions, bodily fluids, or respiratory droplets, as well as extended face-to-face interactions. Contaminated items, including apparel, linens, or towels, also facilitate transmission (6). Intimate contact, encompassing oral, anal, and vaginal intercourse, has been recorded as a mode of transmission. Consequently, family members, carers, and healthcare professionals face increased risk, especially in environments characterized by prolonged exposure (7). In the last 2 years, mpox has garnered worldwide attention, leading the World Health Organization (WHO) to classify it as a "Public Health Emergency of International Concern (8)." In 2022, global outbreaks of clade IIb were documented, particularly among sexually active males (9), and in 2024, clade I reemerged, coming from the Democratic Republic of the Congo (10).

The first confirmed case of mpox in Sierra Leone was identified in January 2025 within the Western Area Urban region. The patient was a 27-year-old male from Hamilton. After the diagnosis, the Ministry of Health (MoH) and the National Public Health Agency (NPHA) carried out a fast and coordinated response. A multidisciplinary Rapid Response Team (RRT) was deployed to examine the case, avert future transmission, and notify healthcare providers of possible further infections.

This report describes the clinical and epidemiological investigation of the index case in Freetown, Sierra Leone. It offers recommendations aimed at strengthening public health measures for the prevention, early detection, and control of emerging mpox threats.

Methodology

On January 9, 2025, an outbreak investigation was conducted in the Western Rural District of Freetown, involving an index case. The study used the WHO case investigation form and line-listed form for both the case and contact. An RRT was immediately activated after receiving notification from the Hospital Surveillance Officer, including the Director of Surveillance and Applied Epidemiology, the Emergency Preparedness and Response Manager, and a member of each of the Case Management, Infection Prevention and Control, Surveillance, and Risk Communication and Community Engagement teams, and an epidemiologist.

A National Public Health Emergency Management Committee (PHEMC) was convened at the NPHA Headquarters, and a plan for field investigation was arranged. Following the declaration of the outbreak by the Honorable Minister of Health, the National Public Health Emergency Operation Center (PHEOC) and two district PHEOCs in Western Area Urban and Western Area Rural were activated. The National Incident Management System was constituted to coordinate the response, and an incident action plan was developed. Field visits to the index home and place of work were scheduled, and also visits to the health center where the case was seen since his onset of symptoms on December 22, 2024. All contacts were traced and listed in a 21-day follow-up. Patients and contacts received counseling and health education, while high-risk contacts were subjected to isolation.

Senior leadership of the NPHA and partners were informed and updated. The directors of the NPHA and MoH, Connaught Hospital, and nurses were advised to alert all hospitals, clinics, and health centers across the country about the case after it had been declared as an outbreak by the Honorable Minister of Health. The case definition was based on the MoH/NPHA protocol. All logistics were made available to the field teams, and the MoH/NPHA guidelines for mpox were reviewed and updated on January 12, 2025.

All information about the index case was gathered, and both the case and contacts went through physical examinations. All contacts were monitored for 21 days. Daily reports for both the case and contacts were updated often and shared with the relevant authorities. The MOH/NPHA case definition for mpox was used to classify individuals either as suspect or as a confirmed case in accordance with the Sierra Leone MOH/NPHA protocols.

Results

After the epidemiological investigation and line listing were conducted, the results revealed a confirmed case of mpox in a 27-year-old male from Hamilton, Western Area Rural, Freetown, Sierra Leone. The case recovered fully, and none of the contacts got infected.

Index case

The case is a 27-year-old male who is single and lives in the Western Area Rural, and works as a car dealer. On December 22, 2024, he presented at Connaught Hospital with a fever. On January 6, 2025, his condition worsened with sore throat and bodily pain, followed by skin lesions on his face, palms, soles, arms, and feet.

The sequence of events

On December 26, 2024, he traveled to Lungi and remained there for 11 days. The case came back to Freetown on January 5, 2025. He denied any sexual contact with a suspected case or with any type of rash. Furthermore, there was no history of contact with animals. While he was in Lungi, the patient confirmed having generalized body pain and fatigue and then visited a nurse, where he was treated for fever. On subsequent days, the patient then traveled to Freetown and went to Connaught Hospital; he was seen at the outpatient department by a nurse. The patient's sample was collected from the lesion site and sent to the Military 34 P2+ lab for Mpox diagnosis using the polymerase chain reaction (PCR) detection technique. Thereafter, he was isolated. On January 10, 2025, the results were confirmed positive for mpox. The same samples were sent to Jui P3 Lab for quality control (QC).

Laboratory confirmation

A sample from the patient was collected for sequencing, and the results from the genomic sequencing confirmed the mpox Clade IIb virus.

Source of infection

The root cause of the disease was not identified. Yet the diseases can spread by close contact with an mpox patient, either by bodily fluids, skin-to-skin contact, or lesions.

Contact tracing

On January 11, 2025, a team was set up to identify and list contacts, provide counseling, determine sources where infections occur, and locate active cases. The field team paid visits to the Connaught Hospital administration, the patient's family members, community stakeholders, and his workplace. The team identified and listed nine contacts. Every contact was examined and monitored for 21 days. No one was infected throughout the 21-day contact period.

Risk communication and community engagement

The family was given health education as well as information on preventive and control measures for mpox. Counseling was also provided to the patient and his relatives to assist in dealing with the situation. Contacts were informed of the condition's symptoms and nature and monitored for 21 days after their last visit with the patient.

Outcome of the case

The patient made a full recovery.

Summary result of index case

Table 1 shows that the index case was having a high fever (>38.5°C), sore throat, lesions, and rash, which are the typical signs and symptoms of mpox.

Discussion

The report details Sierra Leone's first mpox outbreak in years, which occurred in the Western Area Rural. The outbreak is most likely caused by close contact, as documented in previous outbreaks (11). The case maintained close contact with members of the Lungi community. He denied having sexual contact with anyone with rashes or being exposed to people with rashes or relatives who were ill with mpox. Virology genome sequencing of the case revealed that it was infected with mpox clade IIb, which spread globally between 2022 and 2023 (12). The condition is believed to be linked to travel, as the case visited Lungi prior to symptom onset, which is consistent with the known mpox incubation period. The virus can spread by close contact with an infected individual (13).

Furthermore, modeling studies have shown that the most important determinant of the basic reproductive number is the number of sexual partners (14). The index case exhibited typical mpox signs, such as fever, body pains, lesions, and a rash. The index case was isolated, and only a few staff members attended to reduce the transmission to Health Care Workers (HCWs). This outbreak showed the aspects necessary for the prompt detection, prevention, and management of mpox. To avoid future transmission, an early and accurate diagnosis is required. Another component of this outbreak is balancing effective quarantine and concern for patient dignity and confidentiality. Maintaining confidentiality and respect for people's rights are important while managing a highly contagious illness in a family environment. Family members in this study had explicit instructions on how to maintain hygiene and isolation, and every effort was taken to ensure their privacy was protected. This strategy enhances public confidence and enables individuals to seek assistance without fear of discrimination (15).

TABLE 1 | Summary result of the case with associated symptoms.

Index case	Fever >38.5°C	Sore throat	Lesions	Rash
Signs and symptoms				

Moreover, history-taking in diseases might be confounded by displayed social stigmas, especially among males who have sexual relations with men. Though the case denied having any sexual intercourse, possibly due to a fear of being judged. Accurate and extensive history-taking is essential for understanding the fundamental epidemiological context, but it entails establishing a safe and nonjudgmental environment in which people feel comfortable giving sensitive information (16). Healthcare personnel should be trained to overcome stigma-related barriers and treat all patients with dignity and respect, regardless of their origins or race. By doing so, it will improve historical quality and, consequently, the precision of outbreak control or investigations.

Limitation

The study has some limitations, which should be acknowledged. The first challenge is to identify the source of the outbreak, given the likely travel history. Second, there is no conclusive data. Third, the line listed was hesitant to be quarantined due to the inconvenience.

Conclusion

The study revealed the first mpox outbreak in Sierra Leone after several years of absence, which was likely caused by close contact. Minimizing the spread requires early detection backed by a strong surveillance system. The outbreak raised awareness about the importance of early diagnosis and the necessity of taking mpox into consideration in individuals with inexplicable rashes.

Recommendation

Public health interventions should prioritize early detection, proper preventative measures, privacy, cultural sensitivity, and local capacity, as well as quarantine rules for contacts.

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Conflicts of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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