



Marburg virus disease outbreak amid COVID-19 pandemic: an emerging concern in Ghana, West Africa

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Dear Editor,

The outbreak of Marburg hemorrhagic fever poses a significant threat to the public's health in sub-Saharan Africa, particularly in Ghana. The *Marburgvirus* genera belong to the Filoviridae family (filovirus)^[1]. The WHO has recognized the Marburg virus (MARV) as one of the most important viruses and rated as a pathogen of Group 4 Risk. It is the cause of a lethal and severely affecting hemorrhagic fever, with a case mortality rate of the virus ranging from 24.0 to 88.0%^[2].

In terms of African history, the first case of Marburg virus disease (MVD) was reported in Uganda in 1967. This occurred in the setting of the continent of Africa. Additional reports of solitary instances and MVD outbreaks have been documented in the countries of Zimbabwe (1975), Kenya (1980, 1987), the Democratic Republic of the Congo (1994, 1998–2000), Angola (2005), and Uganda (2007). In 1975, South Africa also reported outbreaks of the MARV, which was caused by the importation of infected patients from Zimbabwe^[1]. In Africa, fruit bats of the family Pteropodidae are considered natural hosts of filoviruses – the viruses that cause MARV. The Egyptian Fruit bats belonging to the genus *Rousettus aegyptiacus* are considered potential hosts of the MARV, and bats belonging to the genera *Hypsignathus*, *Epomops*^[1,3].

The first case of MVD was reported in 1967 when laboratory staff working with African green monkeys in the Germany and Serbia became infected at the same time. Following the initial

case, numerous other outbreaks occurred worldwide, including in the Uganda, Angola, Congo, Kenya, and the USA in 2008^[2]. In July 2022, Ghana declared its first outbreak of MVD, the second that in Africa after 2020, the starting year of COVID-19 pandemic. The virus was first detected in that region in the year 2021 in Guinea when one case was discovered^[4].

According to research, the MARV can be passed from person to person through direct contact with bodily fluids, such as blood, secretions, organs, or other body fluids of infected individuals which places healthcare personnel and the population at danger. In addition, burial services, particularly those in which loved ones and friends of the deceased person come into physical touch with the body of the deceased person, play an important part in the spread of the virus. During the treatment of the Marburg patients, it has been realized that some of the healthcare professionals had become infected with the virus through close contact with the patients without taking the appropriate infection control precautions or practicing acceptable barrier nursing protocols. According to the records kept by the WHO, around 9% of those who have died from Marburg have been healthcare workers^[1].

On 7 July 2022, the Ghanaian Ministry of Health reported two incidences of MVD in the Ashanti Region^[4]. The first case was a male agricultural laborer, 26 years old, in Adansi North district, Ashanti region, who had previously traveled to the Western region. He moved from the Western area to the Ashanti region before the commencement of symptoms on June 24. On June 26, he sought medical attention and died on June 27. The other case was that of a 51-year-old man who was a farm laborer from the Bekwai region in Ashanti. On June 28, he sought treatment at the same hospital as the previous case but died the following day. Both instances presented with fever, general malaise, nose, mouth, and subconjunctival bleeding^[5]. Till date, the Health Ministry of Ghana has reported three confirmed cases and a suspected case^[6].

The WHO has already deployed its team in Ghana, along with local healthcare authorities, for rapid identification of cases and increased rate of investigations. Surveillance has been strengthened, and sources of transmissions are being actively identified. Educational activities have been increased at the community level to increase the masses' knowledge about Marburg's risks and dangers. Ghana has declared Watch Level 1 concerning the MARV for all travelers coming to Ghana^[7].

Clinical diagnosis of MVD might be difficult because the signs and symptoms are similar to malaria, typhoid fever, dengue, or endemic viral hemorrhagic fevers like Lassa or Ebola. Hence, diagnosis during the initial phase of the outbreak is always challenging. Enzyme-linked immunosorbent assay (ELISA), PCR, and immunoglobulin M Capture ELISA serve as the confirmatory

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tests. Virus isolation should always be done in high containment laboratories. In the later course of the disease, immunoglobulin G Capture ELISA may serve to be handy^[8]. Since a Biosafety Level-IV laboratory is required for the diagnosis of MVD, the best technology and transportation should be used so that even with a small number of laboratories, a large number of samples can be tested very fast, and with all safety protocols in place, which will also serve to be very cost-effective for the Ghanaian government.

Currently, there are no treatment measures known and no protocols in place for MVD. Patient management includes symptomatic and supportive treatment – balancing fluid and electrolyte levels, maintaining oxygen status and blood pressure, replenishing blood and its components, and treating any further complications^[9]. Asian countries are already affected with Crimean Congo hemorrhagic fever^[10]. MVD is creating a new concern in the field of hemorrhagic diseases. COVID-19, Monkeypox, unknown disease like tomato fever and several other diseases are already in the emerging state^[11,12]. Efforts should be made to avoid contact with the fruit bats *Rousettus aegyptiacus* and already affected individuals. Similar control measures that are used for other hemorrhagic fevers can be put into force to curb the spread of MVD. Direct physical contact can be avoided by wearing personal protective gear, and infected individuals should be placed in strict isolation. There is also an increased need for proper sterilization and disposal of needles, personal protective equipments, and patient wastes. Healthcare givers and family members of the ill should take added precautions^[13]. A proper standard operating protocol is highly needed. Preparing a central laboratory with all the needed facilities, is highly important. Adequate amount of medication should be reached in the affected places. Increased caution should be exercised by people traveling to Ghana, especially to Ashanti, the region most affected by the MARV. One should avoid contact with people presenting with fever, chills, myalgia, rashes, sore throat, diarrhea, weakness, stomach ache, and bleeding or bruising due to unknown causes. Travelers should look for symptoms in themselves until 21 days after traveling from Ghana^[6].

There is also an extreme need for increased mass education and awareness campaigns on the risk factors of MARV, protecting themselves from the virus and what to do in case of presentation of symptoms. We realized that more research is needed in this field to improve the knowledge gap. As there is no treatment available, it is only with increased precaution and more awareness that Ghana can win the battle against Marburg.

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Authors' contribution

D.M. helped in conceptualization ideas. All authors were involved in data curation, writing of initial draft, review and editing, and final draft.

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The authors declare that they have no financial conflict of interest with regard to the content of this report.

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