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An outbreak of Marburg Virus Disease (MVD): Transmission and prevention

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DESCRIPTION

Both humans and non-human primates can be afflicted by the uncommon but severe hemorrhagic fever known as Marburg Virus Disease (MVD). The Marburg virus, a genetically distinct zoonotic (or, animal-borne) RNA virus of the filovirus family, is the culprit behind MVD. The only other known members of the filovirus family are the six different species of the Ebola virus.

The African fruit bat *Rousettus aegyptiacus*, is the reservoir host of the Marburg virus. Fruit bats with the Marburg virus do not exhibit overt symptoms of sickness. The Marburg virus can infect primates, including humans, and cause acute illness with a high fatality rate. If additional species could also host the virus, more research is required to confirm this. This Rousettus bat is a commonly seen, widely dispersed cave-dwelling bat in Africa. Given the widespread distribution of fruit bats, MVD epidemics may occur in more places than previously thought. Other continents, like North America, are not known to be home to the virus.

TRANSMISSION

Human MVD infection is caused by initial exposure to mines or caves with Rousettus bat colonies *via* direct human-to-human contact (through broken skin or mucous membranes) with the blood, secretions, organs, or other body fluids of infected persons, as well as surfaces and items (such as bedding and clothing) contaminated with these fluids, Marburg spreads from person to person.

While attending to patients with suspected or proven MVD, healthcare personnel have regularly become infected. Close contact with patients has led to this when infection control measures are not carefully followed. More severe disease, quick deterioration, and probably a greater fatality rate are linked to transmission via contaminated injection equipment or through needlestick wounds. Direct contact with the deceased's corpse during funeral rites has been linked to the spread of Marburg. As long as the virus is present in a person's blood, they are contagious.

SIGNS AND SYMPTOMS

After an incubation period of 2-21 days, symptoms such as fever, chills, headaches, and myalgia suddenly appear. A maculopapular rash may appear around the fifth day following the start of symptoms, with the chest, back, and stomach being the areas that are most noticeable. It's possible to experience nausea, vomiting, chest pain, a sore throat, abdominal pain, and diarrhea. jaundice, pancreatic inflammation, extreme weight loss, disorientation, shock, liver failure, extensive bleeding, and multi-organ malfunction are just a few of the symptoms that get progressively worse.

It might be challenging to make a clinical diagnosis of Marburg Virus Disease (MVD). Many of the symptoms of MVD are comparable to those of other infectious diseases (such as typhoid fever or malaria) or viral hemorrhagic fevers that may be common in the area (such as Lassa fever or Ebola). This is especially true if there is only one example at issue. For MVD, the case-fatality rate ranges from 23% to 90%.

DIAGNOSIS

Clinically separating MVD from other infectious disorders such as malaria, typhoid fever, shigellosis, meningitis, and other viral hemorrhagic fevers can be challenging. To confirm that symptoms are caused by Marburg virus infection, diagnostic techniques such as Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) assays, antigen-capture detection tests, serum neutralisation testing, electron microscopy, and viral isolation by cell culture are used. Patient samples carry a high biohazard risk; hence, laboratory testing on non-inactivated samples needs to be done under the strictest biological containment measures. The triple packaging

strategy should be used to transport any biological samples both domestically and internationally.

TREATMENT AND VACCINES

There are currently no licenced vaccinations or antiviral medications for MVD. Survival is improved by supportive care, rehydration with oral or intravenous fluids, and treatment of certain symptoms. Antivirals like Remdesivir and Favipiravir, which have been used in clinical studies for Ebola Virus Disease (EVD), could be studied for MVD or used under compassionate use or expanded access. Monoclonal antibodies (mAbs) are also being developed.

The EMA authorised the sale of Zabdeno (Ad26.ZEBOV) and Mvabea (MVA-BN-Filo) as EVD treatments in May 2020. The Zaire ebolavirus and three other viruses from the same group have been modified to create four proteins, and this virus, known as Vaccinia ankarae Bavarian Nordic (MVA), is present in the Mvabea (filoviridae). The vaccination may offer MVD protection, but clinical trials have not shown that it is effective.

PREVENTION

Since research on the transmission of the Marburg virus from wildlife to humans is still underway, prevention strategies against infection are not well established. But one method to guard against infection is to stay away from sick non-human primates and fruit bats (*Rousettus aegyptiacus*). Similar to those employed for other hemorrhagic fevers, secondary, or person-to-person, transmission prevention measures are available. Direct physical contact with a patient should be avoided if they have Marburg Virus Disease (MVD), whether they are suspected of having it or have been diagnosed with it. These safety measures include putting on protective clothing, gloves, and masks; isolating the infected person; and sterilising or disposing of needles, tools, and patient waste.

MVD is a fairly rare condition in people. However, when it does, there is a chance that it will spread to other people, particularly medical professionals and the patient's family. It is essential to raise awareness of the clinical symptoms experienced by patients with MVD among both the general public and healthcare professionals. Increased knowledge may enable family members and healthcare professionals to take early and more effective steps to prevent the spread of the Marburg virus.

Another priority is enhancing the use of diagnostic tools. It is now possible to obtain quick testing of samples in disease control centres with Biosafety Level 4 laboratories (laboratories equipped with the highest level of biosafety precautions) to confirm or rule out Marburg virus infection, thanks to modern transportation methods that allow access even to remote areas.