Research Paper

Volume : 5 | Issue : 4 | April 2016 • ISSN No 2277 - 8179 | IF : 3.508 | IC Value : 69.48

Ebola Virus Disease (Evd): An Update.

Medical Science

KEYWORDS : Ebola, outbreak, transmission, prevention, management.

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ABSTRACT

Ebola virus disease (EVD) formerly known as Ebola Hemorrhagic Fever (EHF) is a severe and a fatal illness, with a case fatality rate of about 50%. It is one of the world's most virulent diseases. EVD outbreaks can ruin families and communities and countries economic stability. The infection is transmitted by direct contact with the blood, body fluids and tissues of infected animals or people.

The World Health Organization has declared the Ebola outbreak raging in West Africa is a global public health emergency that requires a strong, immediate and coordinated international response to prevent spread of the disease.

With no available vaccine and specific treatment, screening of travelers from counties with confirmed outbreak and increasing the awareness of the public and health care professionals is the only way available to prevent EVD outbreak in our country.

Introduction:

The disease gets its name from the Ebola River, branch of the Mongala River which is a tributary of Congo River in the Democratic Republic of Congo. The first documented outbreak of Ebola was in 1976, two simultaneous outbreaks in Nzara, Sudan and in Yambuka, Democratic Republic of Congo. Yambuka was situated close to Ebola River and hence the disease was named Ebola.

Ebola is caused by infection with a virus of the family Filoviridae (filovirus), genus Ebolavirus along with genus Marburgvirus and genus Cuevavirus. Ebola virus is zoonotic (animal-borne) with bats being the most likely reservoir.

The identified four subspecies in genus Ebolavirus which have caused disease in humans are: Zaire ebolavirus (EBOV), Bundibugyo ebolavirus (BDBV), Sudan ebolavirus (SUDV) and Taï Forest ebolavirus (TAFV, formerly *Côte d'Ivoire ebolavirus*). The fifth species Reston ebolavirus (RESTV), is found in Philippines and the People's Republic of China, can infect humans, but no illness or death in humans has been reported.

Transmission:

The natural reservoir of ebolaviruses has not proven and how the virus first appears in a human at the start of an outbreak is unknown. The first patient becomes infected through close contact with the blood, secretions, organs or other bodily fluids of infected animals. In Africa, infection has been documented through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest.

Ebola spreads in the community through human-to-human transmission, with infection resulting from direct contact (through broken skin or mucous membranes) with the blood, semen, body secretions, organs or other bodily fluids of infected people, and indirect contact with environments contaminated with such fluids. Burial ceremonies in which mourners have direct contact with the body of the deceased person can also play a role in the transmission of Ebola.

Since EVD can be transmitted by semen, male EVD survivors are declared negative only when two semen samples taken one week apart are found negative by RT-PCR. So, the EVD survivors are educated about abstinence or to practice safe sex and hygiene for 12 months or till two semen samples are tested negative.

Health-care workers have frequently been infected while treating patients with suspected or confirmed EVD. This has occurred through close contact with patients when infection control precautions are not strictly practiced. The instruments should be adequately cleaned/serialized or disposed to prevent transmission of the disease in a health care setting during an outbreak.

Those at higher risk of infection during an outbreak are: health workers, family members or those who were in close contact with infected person, or those who come in contact with the deceased person as a part of burial ceremonies.

The health effects of the virus to at risk population groups, such as immuno-compromised persons, persons with underlying medical conditions, pregnant women and children is not known.

The recent outbreak of EVD has affected both urban and rural population and the case fatality rate varies between 25% - 90%.

Signs and symptoms:

Symptoms may appear anywhere from 2 to 21 days after exposure to Ebola virus though 8-10 days is most common.

EVD is a severe acute viral illness often characterized by the sudden onset of fever, fatigue, weakness, joints and muscle pain, headache, stomach pain and sore throat. These are followed by vomiting, diarrhoea, rash, impaired kidney and liver function and in some patients both internal and external bleeding. Some patients may also develop red eyes, hiccups, cough, chest pain, difficulty breathing and difficulty swallowing. People are infectious as long as their blood and secretions contain the virus.

Some people recover from EVD while others do not and the reasons for the same are not fully understood. There was no significant immune response among those patients who died of EVD.

Diagnosis:

The early symptoms of EVD are nonspecific and it mimics other infectious diseases like malaria, typhoid and meningitis.

Ebola virus infections can be diagnosed definitively in a laboratory through several types of tests:

1. Within few days of suspected symptoms: Antigen-capture enzyme-linked immunosorbent assay (ELISA) testing, IgM ELISA, polymerase chain reaction (PCR), virus isolation.
2. Later in disease course or after recovery: IgM and IgG antibodies.
3. Retrospectively in deceased patients: Immunohistochemis-

try testing, PCR, virus isolation.

The samples from infected patients are extremely biohazardous; testing should be conducted under maximum biological containment conditions.

Laboratory findings may also include low white blood cell and platelet counts and elevated liver enzymes.

Treatment:

Supportive therapy is the standard treatment for EVD and this consists of:

- Oral or intravenous fluids and electrolyte maintenance.
- Monitoring oxygen saturation and blood pressure
- Treatment for specific symptoms, underlying/secondary infections and for any complications.

People who recover from EVD develop antibodies that may last up to 10 years. It's not apparent if people who recover will develop immunity for life or they can be infected with other species of Ebola.

Potential treatment products in the form of blood products, immune therapies and drug therapies are under evaluation. No licensed vaccines are available but 2 potential vaccines are undergoing human safety testing.

The long term complications commonly seen among people recovered from EVD were joint and vision problems.

If a person has the early symptoms of EVD, the patient should be isolated and Government health systems notified. Supportive therapy can continue with proper protective clothing until samples from the patient are tested to confirm infection.

Care should be taken for appropriate cleaning/sterilization and/or disposal of the personal protective equipment's and other instruments.

Prevention and control:

The outbreak control depends on application of a package of interventions - case management, surveillance and contact tracing, a good laboratory service, safe burials and social and community participation. Health education to increase awareness about risk factors and individual protective measures also help reduce human transmission.

The **risk reduction messaging** should focus on the following:

- Wildlife-to-human transmission (contact with infected fruit bats or monkeys/apes and consumption of their raw meat): Animals should be handled with gloves and other appropriate protective clothing. Meat and blood of animal should be thoroughly cooked before consumption.
- Human-to-human transmission (direct or close contact with people with EVD symptoms and/or their body fluids): Gloves and appropriate personal protective equipment should be worn when taking care of ill patients. Regular hand washing is required after visiting patients in hospital, as well as after taking care of patients at home.
- Possible sexual transmission: Male survivors of EVD should practice safe sex and hygiene for 12 months from onset of symptoms or until two semen samples taken a week apart are negative for Ebola virus. Contact with body fluids should be avoided and washing with soap and water is recommended.
- Containment measures: Includes prompt and safe burial of the dead, identifying contacts of people who are infected with Ebola and monitoring their health for 21 days, the importance of separating the healthy persons from the sick persons to prevent further spread and the importance of good hygiene and clean environment.

Controlling infection in health-care settings:

Isolation of suspected or confirmed EVD people. Health-care workers should always take standard precautions when caring for patients, regardless of their diagnosis. These include basic hand hygiene, respiratory hygiene, use of personal protective equipment (to avoid splashes or contact with infected materials), safe injection practices and safe burial practices.

Health-care workers caring for patients with suspected or confirmed EVD should adopt infection control measures to avoid contact with the patient's blood and body fluids and contaminated surfaces or materials such as clothing and bedding. Face protection (a face shield or a medical mask and goggles) are a must if in close contact (within 1 metre) of patients with EVD, a clean, non-sterile long-sleeved gown and gloves.

Laboratory workers are also at risk. Samples taken from humans and animals for investigation of Ebola infection should be handled by trained staff and processed in suitably equipped laboratories.

Avoid direct, unprotected contact with the bodies of people who have died from EVD.

Travel and screening:

The risk of a tourist or business person becoming infected with Ebola virus and developing disease after returning is extremely low, even if the travel included visiting affected areas and local areas from which primary cases have been reported. This is because, transmission requires direct contact with blood, secretions, organs or other body fluids of infected living or dead persons or animal, all of which are unlikely exposures for the average traveler. In any event, tourists are advised to avoid all such contacts.

Travelers who show initial symptoms of EVD should be isolated to prevent further transmission. Although the risk to fellow travelers in such a situation is very low, contact tracing is recommended under these circumstances.

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