

Ebola Virus (*Infectious Diseases*)

Ebola first appeared in 1976 in 2 simultaneous outbreaks, in Nzara, Sudan, and in Yambuku, Democratic Republic of Congo. The latter was in a village situated near the Ebola River, from which the disease takes its name. Members of the Filoviridae, these viruses are stable, highly

infective particles, approximately 80-100 nm in diameter. They are filamentous, elongated, flexible, and enveloped, with genetic material composed of a single nonsense, nonsegmented RNA strand.

Key facts

Ebola virus disease (EVD), formerly known as Ebola haemorrhagic fever, is a severe, often fatal illness in humans.

The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission.

The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.

Community engagement is key to successfully controlling outbreaks. Good outbreak control relies on applying a package of interventions, namely case management, surveillance and contact tracing, a good laboratory service, safe burials and social mobilisation.

Early supportive care with rehydration, symptomatic treatment improves survival. There is as yet no licensed treatment proven to neutralise the virus but a range of blood, immunological and drug therapies are under development.

Transmission

Ebola is introduced into the human population 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 then spreads in the community through human-to-human transmission, with infection resulting from direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people, and indirect contact with environments contaminated with such fluids. Men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness. 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.

However, Ebola is not a respiratory disease like the flu, so it is not transmitted through the air. Ebola is not a food-borne or water – borne illness. Individuals

who are not symptomatic are not contagious. In order for the virus to be transmitted, an individual would have to have direct contact with an individual who is experiencing symptoms.

Signs and symptoms

The incubation period, that is, the time interval from infection with the virus to onset of symptoms is 2 to 21 days. Humans are not infectious until they develop symptoms. First symptoms are the sudden onset of fever fatigue, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, symptoms of impaired kidney and liver function, and in some cases, both internal and external bleeding (e.g. oozing from the gums, blood in the stools). Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes.

Diagnosis

Other diseases that should be ruled out before a diagnosis of EVD can be made include: malaria, typhoid fever, shigellosis, cholera, leptospirosis, plague, rickettsiosis, relapsing fever, meningitis, hepatitis and other viral haemorrhagic fevers. Due to its characteristic course and epidemiology, a history of exposure in an endemic area (ie, sub-Saharan Africa) may prompt clinical suspicion. Culture is positive during the acute stages, and laboratory confirmation via polymerase chain amplification and/or antigen detection may be used.

Treatment

Supportive care-rehydration with oral or intravenous fluids- and treatment of specific symptoms, improves survival. There is as yet no proven treatment available for EVD. However, a range of potential treatments including blood products, immune therapies and drug therapies are currently being evaluated. No licensed vaccines are available yet, but 2 potential vaccines are undergoing human safety testing.

Preventive steps

- Reducing the risk of wildlife-to-human transmission from contact with infected fruit bats or monkeys/apes and the consumption of their raw meat.
- Animals should be handled with gloves and other appropriate protective clothing. Animal products (blood and meat) should be thoroughly cooked before consumption.
- Reducing the risk of human-to-human transmission in the community arising from direct or close contact with infected patients, particularly with their bodily fluids.
- Close physical contact with Ebola patients should be avoided.
- Barrier nursing techniques include:
 - wearing of protective clothing (such as masks, gloves, gowns, and goggles)
 - using infection-control measures (such as complete equipment sterilization and routine use of disinfectant)
 - isolating patients with Ebola from contact with unprotected persons.
 - regular hand washing is required after visiting patients in hospital, as well as after taking care of patients at home.

Reference:

1. <http://www.who.int/mediacentre/factsheets/fs103/en/>
2. <http://www.cdc.gov/vhf/ebola/exposure/index.html>