

Overview of ebola



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Ebola virus is a deadly virus which cause disease in humans and nonhuman primates for instance monkeys, gorillas, and chimpanzees. Infection caused by the Ebola virus strains is known as Ebola hemorrhagic fever or Ebola.

Virus which cause Ebola infection belong to familyFiloviridae, genusEbolavirus.

Five species of Ebola virus are identified. Among these five species, four cause disease in humans which are:

1. Ebola virus
2. Sudan virus
3. Tai Forest virus
4. Bundibugyo virus

Reston virus is the fifth specie and is known to cause disease in nonhuman primates and not in humans.

History:

Ebola virus disease first emerged in 1976 in 2 simultaneous outbreaks, first one in Nzara, Sudan, and second one in Yambuku few months later. Later a case was reported in a village located near a river named as Ebola River. The disease is named after that river. The first attack of Ebola in Sudan affected about 284 people with mortality rate of approx. 53%. The second Ebola virus appeared from Yambuku(EBOZ) has mortality rate of 88% and affected 318 people. Use of contaminated syringes and needles in clinics and hospitals and close personal contact with infected ones are considered as main cause of outbreak of disease.

In 1989, the third strain of Ebola named as Ebola Reston (EBOR) was discovered in USA (Virginia and Pennsylvania) through imported infected monkeys into Virginia from Philippines. In 1990, once again EBOR was emerged in Virginia and Texas by imported monkeys but four people developed antibodies and remained safe. Later in 1994, the last strain of Ebola named as Ebola Cote d'Ivoire (EBO-CI) was discovered while conductance of a necropsy on a dead chimpanzee sighted in the Tai Forest by a female ethologist. One more case occurred in gold-mining camps located in the rain forest in the same year with mortality rate of 60%. Initially the disease was thought to be yellow fever and was identified as Ebola virus disease much later. In 1995, virus appeared in Kikwit with mortality rate of 81%. Later in 1996, ebola virus appeared in South Africa with mortality rate of 50% when medical professional travelled to South Africa from Gabon after treating Ebola-infected patients. He was admitted in hospital and a nurse whose duty was to take care of doctor, also became infected and died. Another case occurred in Mayibout area with mortality rate of 57% when an infected chimpanzee was eaten by people hunting for food. In 2000, virus appeared in Masindi, Gulu, and districts of Uganda with mortality rate of 53%. In 2001 and 2002, disease emerged in the Republic of the Congo and over the border of Gabon and with mortality rate of 82% and was the first time that Ebola virus disease spread in the Republic of the Congo. In 2003, outbreak of infection appeared in Mbomo and Mbandza villages with mortality rate of 83%. In 2004, cases of disease were reported in Yambio county of southern Sudan accompanied with measles at the same time with mortality rate of 41%. Later in 2007, virus affected people in Kasai Occidental Province and Bundibugyo District in western Uganda with

mortality rate of 71% and 25% respectively. In 2008, strains of Ebola-Reston were discovered in pigs. In 2011, a patient died in the Luwero district, Uganda due to Ebola Hemorrhagic fever as diagnosed by The Uganda Ministry of Health. In 2012, a viral attack was reported in the Kibaale District of Uganda. In 2013, disease emerged in the Luwero District. Samples were tested by CDC's Viral Special Pathogens. Recently in 2014, infection was reported in several villages located in the Democratic Republic of the Congo in months of August to November with mortality rate of 74%. In March, virus attacked multiple countries in West Africa.

Worldwide occurrence:

Ebola is a rare disease and has spread in Guinea, Sierra Leone and Liberia.

Severely affected countries by Ebola included Guinea, Sierra Leone and Liberia due to weak health systems, shortfall of infrastructural and human resources. Ebola outbreak also began in Boende, Equateur which is a part of the Democratic Republic of Congo. Ebola virus disease occurs in the Republic of the Congo, Africa, Ivory Coast, Sudan, Gabon, and Uganda, but there are chances of its occurrence in other African countries.

Transmission:

Fruit bats that are included in Pteropodidae family are considered as natural Ebola virus hosts. Introduction of Ebola virus into the human population occurs through close contact with the organs, blood and secretions. Virus can also be transmitted by bodily fluids of infected animals such as gorillas, chimpanzees, forest antelope, monkeys, porcupines, and fruit bats.

Virus spreads via direct close contact through broken skin, fluids of infected people, mucous membranes and materials or surfaces contaminated with these fluids e. g. clothing and bedding.

EVD spreads through close contact with infected patients when control precautions are not firmly practiced. It is transmitted by needles and syringes used to treat Ebola-infected patients.

Transmission of Ebola occurs via those burial ceremonies in which people have direct close contact with the body of the dead infected by EVD.

As long as blood and body fluids e. g semen and breast milk contain the ebola virus, people are considered infectious. Interestingly men can transmit the virus via their semen after recovering from illness

for up to seven weeks.

Symptoms

Symptoms of Ebola virus disease are nonspecific. After the incubation period of 2 to 21 days, signs of Ebola virus are:

- abrupt fever and fever fatigue
- headache
- joint pain
- muscle aches and pain
- sore throat
- weakness

These symptoms are followed by :

. This is followed by

- vomiting,
- diarrhoea,
- rash
- symptoms of impaired kidney and liver function
- both external and internal bleeding e. g. blood in the stools and oozing from the gums in some cases.
- Hiccups
- Stomach pain

It is important to mention that humans are not infectious until they develop specific symptoms for disease.

Diagnosis

Distinguishing EVD from other infectious diseases for instance malaria, typhoid fever and meningitis is a difficult task. For identification of Ebola virus disease following strategies are used in order to confirm that symptoms are caused by Ebola virus.

1. antibody-capture enzyme-linked immunosorbent assay (ELISA)
2. antigen-capture detection tests
3. serum neutralization test
4. reverse transcriptase polymerase chain reaction (RT-PCR) assay
5. electron microscopy virus isolation by cell culture.

ELISA and PCR are considered as efficient diagnostic tests for Ebola virus disease.

Treatment

Still there is no standard treatment for Ebola virus disease and only supportive therapy is available. Supportive therapy includes treatment of specific symptoms and supportive care-rehydration with intravenous fluids or orally. A wide range of treatments including immune therapies, drug therapies and blood products, are recently being evaluated for treatment of Ebola virus disease. Two vaccines are undergoing human safety testing but still there is no licensed vaccine available for treatment.

Prevention and control

Prevention and control of Ebola virus disease is much difficult. One can prevent from disease by early testing and isolation of the infected patient. Moreover , barrier protection for caregivers for instance mask, gown, goggles, and gloves is necessary to prevent others from getting infected.

Outbreak of disease can be controlled by applying a package of interventions, e. g., safe burials , surveillance, , case management , social mobilisation., contact tracing and a good laboratory service.

Outbreak control of disease relies on raising awareness of risk factors and protective measures that individuals can take in order to reduce human transmission. Risk reduction must consider following factors:

- Reducing the risk of wildlife-to-human transmission:

In order to control its outbreak, it is very necessary to avoid contact with infected monkeys or fruit bats and the consumption of their infected meat. Infected and uninfected animals must carefully be handled with gloves and significant protective clothing. Thorough cooking of animal's meat is required

to reduce risk of infection. Reducing the risk of human-to-human transmission:

One must avoid from direct or close contact with people suspected to be Ebola victims. Gloves and specific personal protective equipment must be used while looking after patients at hospitals or at home.

Outbreak containment measures:

It refers to safe burial of the dead, identification of people who may have been remained in contact with infected people, the significance of separating the healthy ones from the sick to prevent further spread and finally the importance of maintaining a neat and clean environment and good hygiene.