Ebola Virus Disease

Public Education

Correspondence: Exon Publications, Brisbane, Australia; Email: books@exonpublications.com

Cite as: Ebola Virus Disease: Public Education. Brisbane (AU): Exon Publications; 2024. Published on 18 Jul.
DOI: https://doi.org/10.36255/ebola-virus-disease-public-education

ABSTRACT

Ebola Virus Disease (EVD) is a severe, often fatal illness in humans caused by the Ebola virus. This article aims to provide information about EVD, serving as a resource for the public to understand the disease better. The article covers the causes, strains, risk factors, prevalence, signs and symptoms, spread, diagnosis, pathophysiology, treatment, and preventive measures of EVD. Written in simple terms, this article is designed to be accessible to all readers, helping them grasp the complexities of Ebola Virus Disease and how to manage and prevent it effectively.

Keywords: Causes of Ebola virus disease; Diagnosis of Ebola virus disease; How common is Ebola virus disease; Introduction to Ebola virus disease; Pathophysiology of

Ebola virus disease; Preventive measures of Ebola virus disease; Risk factors for Ebola virus disease; Signs and symptoms of Ebola virus disease; Spread of Ebola virus disease; The strains of Ebola virus disease; Treatment of Ebola virus disease

INTRODUCTION TO EBOLA VIRUS DISEASE

Ebola Virus Disease is a viral hemorrhagic fever that causes severe illness in humans. The disease was first identified in 1976 near the Ebola River in what is now the Democratic Republic of Congo. Since then, there have been multiple outbreaks, primarily in Africa. EVD is known for its high fatality rate, which can range from 25% to 90%, depending on the outbreak. The Ebola virus is part of the Filoviridae family and is one of the most virulent pathogens known to affect humans (1-3).

CAUSES OF EBOLA VIRUS DISEASE

EVD is caused by the Ebola virus, which is transmitted to humans from wild animals and spreads through human-to-human transmission. The primary reservoirs of the virus are fruit bats, which can transmit the virus to other animals such as monkeys, apes, and antelopes. Humans can become infected through direct contact with the blood, secretions, organs, or other bodily fluids of infected animals. Once a human is infected, the virus can spread to others through direct contact with the blood or bodily fluids

of an infected person, contaminated objects, or infected animals. The virus can enter the body through broken skin, mucous membranes, or needle-stick injuries.

THE STRAINS OF EBOLA VIRUS DISEASE

There are six known species of the Ebola virus, each associated with different outbreak patterns and levels of virulence. These species are Zaire ebolavirus, Sudan ebolavirus, Taï Forest ebolavirus, Bundibugyo ebolavirus, Reston ebolavirus, and Bombali ebolavirus. Zaire ebolavirus is the most deadly, responsible for the largest and most severe outbreaks, including the 2014-2016 West Africa epidemic. Sudan ebolavirus also causes severe disease but has a lower fatality rate than Zaire ebolavirus. Taï Forest and Bundibugyo ebolaviruses have caused smaller outbreaks with lower fatality rates. Reston ebolavirus has been found in non-human primates and pigs but has not caused disease in humans. Bombali ebolavirus is the most recently discovered species and its impact on humans is still being studied.

RISK FACTORS FOR EBOLA VIRUS DISEASE

Certain factors increase the risk of contracting EVD. Individuals living or working in areas where the Ebola virus is present are at higher risk, especially if they come into contact with infected animals or people. Healthcare workers are particularly at risk if they do not use proper

protective measures. Burial ceremonies that involve direct contact with the body of the deceased can also spread the virus. Family members and caregivers of infected individuals are at increased risk due to close contact. Consuming bushmeat, or the meat of wild animals hunted in Africa, can also expose individuals to the virus.

HOW COMMON IS EBOLA VIRUS DISEASE?

EVD is relatively rare but can cause significant outbreaks with high mortality rates. Since its discovery, there have been several notable outbreaks, primarily in Africa. The largest outbreak occurred in West Africa between 2014 and 2016, resulting in more than 28,000 cases and over 11,000 deaths. Smaller outbreaks have occurred in the Democratic Republic of Congo, Uganda, and Sudan. While EVD is not common, its potential for causing large, deadly outbreaks makes it a significant public health concern. Ongoing surveillance and rapid response to outbreaks are essential for controlling the spread of the virus.

SIGNS AND SYMPTOMS OF EBOLA VIRUS DISEASE

The signs and symptoms of EVD typically appear between 2 and 21 days after exposure to the virus. Early symptoms include fever, severe headache, muscle pain, fatigue, and sore throat. As the disease progresses, symptoms can include vomiting, diarrhea, rash, and impaired liver and kidney function. In severe cases, patients may experience

internal and external bleeding, known as hemorrhaging. This can manifest as blood in vomit or stool, or bleeding from the gums and nose.

SPREAD OF EBOLA VIRUS DISEASE

EVD spreads through direct contact with the blood or bodily fluids of an infected person, contaminated objects, or infected animals. The virus can enter the body through broken skin, mucous membranes, or needle-stick injuries. It can also spread during burial ceremonies if mourners have direct contact with the body of the deceased. In healthcare settings, the virus can spread if proper infection control measures are not followed. The Ebola virus is not spread through the air, water, or food, except in the case of handling and consuming bushmeat from infected animals.

DIAGNOSIS OF EBOLA VIRUS DISEASE

Diagnosing EVD can be challenging due to its nonspecific early symptoms, which are similar to those of other infectious diseases such as malaria, typhoid fever, and meningitis. A combination of clinical evaluation and laboratory testing is required for a definitive diagnosis. Laboratory tests include enzyme-linked immunosorbent assay (ELISA), polymerase chain reaction (PCR), and virus isolation by cell culture. These tests detect the presence of the virus or the antibodies produced in response to infection. Early diagnosis is crucial for effective treatment

and isolation of infected individuals to prevent further spread. If EVD is suspected, it is important to seek medical care immediately and inform healthcare providers of any potential exposure to the virus.

PATHOPHYSIOLOGY OF EBOLA VIRUS DISEASE

The pathophysiology of EVD involves the infection of various cells in the body by the Ebola virus. The virus primarily targets immune cells such as macrophages and dendritic cells, leading to a dysregulated immune response. This results in widespread inflammation and tissue damage. The virus can also infect endothelial cells, which line the blood vessels, leading to increased vascular permeability and hemorrhaging. The resulting damage to the immune system and blood vessels can cause severe symptoms, including multi-organ failure. The rapid progression of the disease highlights the need for prompt medical intervention.

TREATMENT OF EBOLA VIRUS DISEASE

Treatment for EVD focuses on supportive care and managing symptoms. This includes maintaining fluid and electrolyte balance, providing oxygen therapy, and treating any secondary infections. Experimental treatments, such as antiviral drugs and monoclonal antibodies, have shown promise in clinical trials. The drug remdesivir and the monoclonal antibody treatment Inmazeb (REGN-EB3) are examples of therapies that have been used to treat EVD.

Vaccines have also been developed to prevent the disease, with the rVSV-ZEBOV vaccine being the most widely used. While there is no specific cure for EVD, early supportive care and experimental treatments can significantly improve survival rates. It is important to seek medical care immediately if EVD is suspected and follow the guidance of healthcare providers.

PREVENTIVE MEASURES OF EBOLA VIRUS DISEASE

Preventing EVD involves taking measures to reduce the risk of exposure to the virus. This includes avoiding contact with infected animals and people, practicing good hygiene, and using personal protective equipment (PPE) when caring for infected individuals. Healthcare workers should follow strict infection control protocols to prevent the spread of the virus in healthcare settings. Safe burial practices are also important to prevent the spread of the virus during funerals. Vaccination is a key preventive measure, especially for high-risk populations such as healthcare workers and individuals living in areas with active outbreaks. Public health education and awareness campaigns can help increase knowledge about EVD and promote preventive measures. Ongoing surveillance and rapid response to outbreaks are essential for controlling the spread of the virus and protecting public health.

CONCLUSION

Ebola Virus Disease is a severe and often fatal illness that requires immediate medical attention and comprehensive

public health measures to control outbreaks. Understanding the causes, symptoms, spread, and treatment of EVD is crucial for managing the condition and preventing its transmission. While EVD is relatively rare, its potential for causing large, deadly outbreaks makes it a significant public health concern. Maintaining good hygiene practices, taking appropriate precautions in high-risk environments, and seeking early medical care are crucial for preventing and managing EVD effectively.

NOTICE TO THE USER

This article was written by professional medical writers for the general public based on peer-reviewed articles indexed in PubMed and peer-reviewed for scientific accuracy by independent experts. It is intended solely for informational purposes and is not to be considered medical advice. The views and opinions expressed in this article are believed to be accurate at the time of publication, but the publisher, editors, or authors cannot be held responsible or liable for any errors, omissions, or consequences arising from the use of the information contained in this article. The publisher makes no warranties, implicit or explicit, regarding the contents of this article or its use.

LICENSE

REFERENCES

1. Feldmann H, Geisbert TW. Ebola haemorrhagic fever. Lancet. 2011 Mar 5;377(9768):849-62. https://doi.org/10.1016/S0140-6736(10)60667-8

2. Baize S, Pannetier D, Oestereich L, Rieger T, Koivogui L, Magassouba N, Soropogui B, Sow MS, Keïta S, De Clerck H, Tiffany A. Emergence of Zaire Ebola virus disease in Guinea. N Engl J Med. 2014 Oct 9;371(15):1418-25. https://doi.org/10.1056/NEJMoa1404505

3. Messaoudi I, Amarasinghe GK, Basler CF. Filovirus pathogenesis and immune evasion: insights from Ebola virus and Marburg virus. Nat Rev Microbiol. 2015 Jul;13(9):663-76. https://doi.org/10.1038/nrmicro3524