

The Killer Virus Ebola

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Abstract: *Ebola viruses for pathological agents associated with a severe, potentially fatal, systemic disease in man and apes. The fatality rate is between 30% to 90%. The first Ebola virus outbreak was seen in the 1970s, in Zaire (now the Democratic Republic of Congo). Most of the outbreak occurs in the Central part of the West Africa including Zaire, Sudan and Uganda. However March and October 2014 reported about 10,000 cases of Ebola virus diseases in West Africa. EVD disease mostly affects the country which is economically deprived as limited sources gradually affect a country's infrastructure and administration. There is a need to setting plans to counter EVD cases in developing countries and devising definitive steps in to limit the spread of the diseases. According to the sources, in their data provided barriers to prevent and control disease in affected countries include irresolute and disorganized health systems, poor personal hygiene practices and false beliefs and stigma related to EVD. EVD is one of the most feared diseases in the world. Also the need to be discuss about how communities should be educated on EVD symptoms, history, mode of transmission, and methods of protection. In this article I describe the epidemiology, pathogenesis, clinical features, diagnosis and treatment of EVD.*

Keywords: Ebola virus disease, Epidemiology, Ebola hemorrhagic fever, Ebola transmission, Ebola prevention and control

1. Introduction

Ebola virus belongs to the Filoviridae family, genus Ebolavirus and frequently occurring infection in human beings [1]. Ebola virus disease shows various serial and nonspecific diseases symptoms including high fever, headache, vomiting, anorexia and diarrhea. In the advanced stages bleeding occurs in the eyes, nose, gums, and guts. The first outbreak of Ebola virus disease was reported in the year 1976 at Democratic republic of Congo [1-4]. This outbreak occurred simultaneously in Nzara, Sudan (involving 281 patients out of which 151 died) and Yambuku, Zaire (now the Democratic republic of Congo) (involving 318 patients out of which 280 died) [5].

The disease got its name from the river Ebola, which passes near the yambuku village where the outbreak occurred first. With an estimated 2350 cases of Ebola virus occurring between the 1970s and 2013, the disease can be referred to as epidemic to some parts of Central Africa [6].

2. Virology of EVD

Ebola virus belongs to the family of filoviridae, which includes three genera: Cuevavirus, Marburg virus, and Ebolavirus. This virus belongs to the order Mononegavirales. About five species of virus have been identified: Zaire, Sudan, Bundibugyo, Reston, and Tai Forest. Most outbreaks of EVD are associated with Zaire ebola virus, Bundibugyo ebola virus, Sudan ebolavirus in Africa [8-11]. The prefix of the family name "filo" derived from latin word for thread or string. Virions have multiple morphological forms of very long filamentous rods or compact convoluted shapes [1]. The ebola virus genome is a single negative-sensed RNA. The virions consisted of seven proteins; nucleoproteins, viral proteins 24, 30, 35 and 40, glycoproteins (GP), and L protein. The virulence of each species may differ markedly from the others [1-3]. For example EVD cases due to EBOV-Z and EBOV-S show high CFRs of over 70% and 50% respectively. While the CFR for EBOV-B is around 27% [3, 7]. Reston Ebola virus

may have low or no virulence in humans but it is thought that virus is highly virulent in simians [1].

3. Transmission of Ebola virus

Although the life cycle of Ebola virus is not precisely known the natural host of Ebola virus are thought to be a species of fruit bat which belongs to the family pteropodidae [13-14]. It is thought that the Ebola virus is transmitted from bats to some species of simians, so EBOV-infected bats and simians may be infectious source of EBOV when comes in contact with humans [12]. There is no evidence that pet cats and dogs, or mosquitoes and other insects transmit ebola virus [15]. Human to human transmission occurs through direct contact with the blood and body fluids (such as urine, feces, semen, breast milk, vomit, mucus) of a infected person, and via surfaces contaminated with these body fluids [16, 17, 18]. The centre for disease control and prevention (CDC-US) and the WHO have recommended that infected individuals should be quarantined for 21 days [19]. The incubation period of Ebola virus is about 2-21 days. According to the new studies Ebola virus transmission occurs when there is high viral load of blood fluids. Patients who have recovered from EVD cannot transmit Ebola virus to others. The WHO advises to abstain from sex or use of condoms for a period of three months after patient is cured. There no until any evidence on when women recovering from the Ebola virus can resume breastfeeding in [20].

4. Clinical features of EVD

The mild symptoms of evd constitute fever, headache, fatigue, sore throat, and muscle pain, which are followed by anorexia, nausea, diarrhoea, vomiting, rash, abdominal pain, cough, shortness of breath, postural hypotension, edema, headache, confusion, and coma [21]. Also this ebola virus tends to cause the severest form of viral haemorrhagic fever in humans. Leukocytopenia and lymphocytopenia may be evident in peripheral blood and subsequent neutrophilia are often seen in the early stages of the disease. These symptoms can resemble other diseases such as malaria,

typhoid, cholera, etc. Cause of death is usually from multiple organ failure due to complication. [1, 3, 22]

5. Diagnosis of EVD

After three days of symptoms, there is detectable level of Ebola virus in the blood [23]. A negative test before this does not rule out the Ebola virus disease. Laboratory finding in EVD include leukopenia, thrombocytopenia, and elevated liver enzyme. IgM enzyme-linked immuno-sorbent assay (ELISA), antigen captured elisa, polymerase chain reaction (PCR) and virus isolation are the diagnostic tests available to test a patient [23]. IgM and IgG antibodies are used for diagnosis in the later stage of recovery. Indication of a good outcome is early and well-regulated inflammatory response with elevated level of IL-6 concentration and IL-1beta, while a defective innate immune response with excessive macrophage and monocyte activation with the release of IL-10, absent antibody response and elevated concentration of interleukin-1 RA and neopterin after a few days of onset of disease is associated with a fatal outcome [24]. According to the latest studies, elevated thrombomodulin and ferritin levels have been associated with death and haemorrhage in Ebola virus infected person [25].

6. Prevention and Control of EVD

According to the reports about 2-8 patients from the most Ebola virus affected African countries monthly, with about% of the destinations being economically deprived countries [26]. As to stop this the very first step is to educate communities on EVD symptoms, history, mode of transmission, and methods of protections, including the importance of personal hygiene practices, via seminars, newspapers, and other social media. One of the popular opinion leader (POL) giving this information would further help to remove the misconception about the nature of the disease and indirectly improve the quality of life of the affected patients and their families [27, 28]. Another important work is to give immediate training to the health workers or health care providers in such areas such as proper diagnosis and isolation of a suspected patient the importance of wearing PPE and safe burial techniques. There is proper distribution of gloves, gowns, masks, soaps, and disinfectants to the health care facilities and hospitals. To enable the safe transport of the EVD patients special ambulances should be reserved [29].

7. Treatment and Therapeutic Drug Development

As we all know there is no definite treatment for Ebola virus, at present [3, 34]. Vaccines and antiviral drugs are not developed for evd. Thus symptomatic treatment methods including electrolyte infusions and antibiotics are used [1, 3]. There are two vaccines which are cAd3-ZEBOVD and rVSV-ZEBOVD developed by the us national institute of allergy and infectious diseases and glaxosmithkline and public health agency of Canada in Winnipeg respectively [31, 32]. In the various experimental cases the drug ZMapp has been administered [33]. Among the anti-viral drugs under developments, a nucleic acid analog known as

“favipiravir” may also be used in the treatment of EVD disease [34]. The speciality of this drug is that this is mainly used for influenza and its function is that it does not allow the viral RNA to replicate through the action of RNA dependent RNA polymerase of influenza virus [35]. Some mechanisms of viral RNA synthesis are similar between Ebola and influenza virus, so it is expected that there is a similar effect of drug on the RNA synthesis of Ebola virus [36]. We may see more and more use of this drug in future to control this epidemic.

8. Conclusion

I have delineated this information of EVD supported the assorted analysis articles. The information we've got up to now, it seems that it'll be tough to predict the extent and outcomes of EVD epidemics in future. But years before HIV infection emerged and unfolded everywhere the planet and currently, because of the continuous efforts by the medical profession, effective treatment ways against the HIV infections are accessible, though the diseases cannot be eradicated. The general public health sector beside individual chief authorities in developing countries should devise methods, keeping the accessible resources in mind to wear down the happening before it happens. EBOV and EVD are areas not well understood at the present, however there's hope that effective treatment ways to combat EVD can presently be developed.

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