Performdigi.com

Expository Essay on Ebola Virus

The **Ebola virus** is one of the most dangerous and deadly viruses known to humans. The Ebola epidemic since its discovery in 1976 came from the Democratic Republic of Congo, formerly known as Zaire, but the largest Ebola outbreak known to date is still ongoing at the time of writing, in the West Africa. An estimated 550 000 reported incidents from Sierra Leone and Liberia took place on January 20, 2015.

The virus is prevalent in many countries including Guinea, Liberia, Sierra Leone, Nigeria as well as occasional reported cases in the USA, Canada. The Netherlands and India show the potential for infection to spread globally. Despite the fact that the disease is highly contagious, life-threatening, and no specific treatment is available, it can be prevented through the use of appropriate measures to prevent and control infection. The study of the Ebola virus is important as such knowledge will pave the way for the reduction of victims, the development of an effective drug and will be useful in controlling the same epidemic.

Virology

The **Ebola virus** is a member of the Philoviridae family. As the name implies the virus has a filamentous shape. Marburg virus and Ebolavirus are two major generations of the virus family that are important in medicine. Bacteria of these two species are studied and presented together due to their many similarities in the life cycle, water storage areas, transmission methods, clinical presentation, treatment and prevention measures. The only difference is that Marburgvirus is still distributed by forest-dwelling bats such as the savannah while Ebolavirus is distributed by bats species accustomed to deep rain forests.

Five subspecies of Ebolavirus, namely, *Ebolavirus Zaire, Ebolavirus Sudan, Ebolavirus reston, Ebolavirus cote d'Ivore, and Ebolavirus bugs,* have been identified and named after the place where they were first discovered. Of these E. Zaire was the first to be isolated and studied and is responsible for a large number of outbreaks including recent outbreaks in 2014 before that E. Sudan accounted for ¼ of all Ebolavirus deaths. With the exception of a slightly lower mortality rate, E. Sudan is almost identical to E. Zaire. E death rate of E case. Sudan is reported as **40-60%** and E. Zaire as **60-90%.**

Transfers

Ebola was originally transmitted to humans as a zoonosis. Different species of bats are found throughout sub-Saharan Africa such as. Contact with bats by biting and scratching or exposure to their discharges and discharges through broken skin or mucous membranes can cause infection in humans. The infection can also be spread to other end users. Those recorded in Africa are deer, wildebeests, chimpanzees, chimpanzees, gorillas, monkeys, and other non-humans. Attacks during the hunting of these animals or handling carcasses of infected animals have led to the introduction of the virus to humans from the wild. Outbreaks appear to be exacerbated during pregnancy and in

childbirth. Records show that outbreaks appear to be exacerbated by the presence of multiple pathogens.

EVD is highly contagious. Infection can be spread in the community and in a hospital setting by direct contact with infected body fluids such as blood, fluid and discharge or the patient's tissues or by direct contact with contaminants such as clothing and bed linen. One of the main reasons for the rapid spread of the epidemic is traditional funeral rites, which include cadaver cleaning, removal of fingernails, toenails and clothing. Caregivers, including health workers, are also at greater risk of contracting the disease. In addition the sperm of the surviving male is said to remain infected for up to 82 days after the onset of symptoms. As long as the virus stays in the body fluids a person stays infected. The spread of the **Ebola virus** is highly suspected but has not been proven by experiments.

Clinical Introduction

EVD caused by different types of Ebola virus brings different clinical features. The incubation period of Ebola virus is generally considered to be 2 - 21 days. **Ebola virus** disease shows a variety of symptoms that develop deep in the prodromal constitution leading to various diagnoses including not only other viral hemorrhagic diseases, but also malaria, typhoid, cholera, and others. bacterial rickettsia and non-infectious causes of bleeding.

The onset of the disease is similar to that of severe hemorrhagic fever. Patients have high fever, fever reaching 39-400C, body aches and fatigue. Subsequent abdominal symptoms such as epigastric pain, vomiting and / or bloodless diarrhea appear if the fever persists throughout the day. 3-5.

After 4 - 5 days of illness macular degeneration may be visible but may not be clearly visible on dark skin. After this stage the bleeding from different areas begins. Bleeding in both the upper and lower digestive tract, the respiratory tract, the urinary tract, the vagina in women can be detected. Continuous petechial in the buccal mucosa, skin and conjunctivae grow. Repeated cleansing bumps that prevent any oral fluid intake and a large amount of wet diarrhea (five liters or more per day) contribute to the loss of excess fluid leading to dehydration. If fluid changes are not enough, bending, extreme fatigue and hypovolemic shock eventually.

Hypovolemic shock was reported in 60% of cases. Despite high body temperature, patients experience cold edges due to peripheral vasoconstriction. Rapid and cord pulses, tachypnea, oliguria or anuria can be detected. At the same time features such as asthma and abdominal pain, muscle and joint pain and headache increase. Although in some cases coughing and dyspnoea occur as a result of pulmonary haemorrhage, other respiratory symptoms are uncommon. Conjunctival injection is a common clinical feature. The most common neurologic symptoms are hypoactive and hyperactive delirium characterized by decreased mental function, confusion, dizziness and unusual tremors. As the disease changes the internal bleeding may also begin but more often by this time the patients are already in a coma.

It is reported that only 5% of patients have bleeding from the gastrointestinal tract before death. Most of the reported deaths occurred as a result of shock during the 7th to 12th day of illness. Symptoms of 40% of patients have improved by day 10 although symptoms such as mouth sores and thrush have already appeared. Most patients who survived until day 13 showed a high chance of

finally recovering. Some patients who showed early improvement in symptoms have had stiff necks and reduced cognitive levels associated with late death.

Pathology

Post-mortem examinations and post-mortem biopsies are very useful in the study of the pathology of the **Ebola virus** disease. Because of the biosafety risk in autopsy staff when handling models, pathological explanations of only a limited number of available conditions.

The most common findings of Haematoxylin and eosin-stained tissue components are oval-shaped or filamentous eosinophilic intracellular inclusions formed by a combination of viral nucleobases. These implants can be found in macrophages, hepatocytes, endothelial cells, fibroblasts of connective tissue etc. Immunohistochemically stains express viral antigens to various infected tissue cells including macrophages, dendritic cells, epithelial cells and sweat glands, intermediate cells and kidney tubes. , seminiferous tubules, endothelial cells and endocardial cells. In addition necrotic cells and cellular waste contain antigens in abundance. Electron microscopy shows an abundance of free viral particles in the alveolar glands, liver sinusoids, and connective tissue cells of the testis and dermal collagen. Karyorrhexis and apoptosis are found in portal triads cells, macrophages of the red spleen pulp and epithelial cells of the tubular kidneys.

Liver tissue exhibits histopathological symptoms including concentrated or widespread necrosis of hepatocytes and central steatosis. Although inflammation is usually mild, hyperplasia of kupffer cells and infiltration of mononuclear inflammatory cells is observed. The infected lung shows congestion, bleeding and intra-alveolar edema but inflammation is not significant. Concentrated infiltration of mononuclear inflammatory cells is known to occur in the lamina propria of the small intestine and colon. Skin biopsies reveal dermal edema, concentrated bleeding, petechiae, ecchymosis, and macular rashes. Spleen and lymph nodes show widespread lymphoid depletion due to apoptosis and necrosis. Inflammation of the kidneys is undetectable although acute tubular necrosis is more common. Even if the heart endocardium contains viral antigens, the myocardium does not show significant damage. Brain histology shows panencephalitis and perivascular infiltration of lymphocytes.

Prevention

The ***World Health Organisation (WHO)*** has recommended a set of measures to prevent and control infection in health workers, including safety measures to be taken in the various stages of EVD patient management.

1. General precautionary measures

Regardless of the disease, it is recommended that health professionals take precautionary measures when treating all patients, as it is difficult to diagnose EVD patients at the onset of the disease. These are,

2. Doing hand hygiene

Use disposable gloves before handling items that may be infected, wear eye protection and a coat before engaging in procedures that body fluids may predict.

3. Hand hygiene

Hand hygiene should be done using soap and water or an alcohol-based hand sanitizer solution, in accordance with WHO guidelines, before wearing gloves and protective equipment (PPE) after exposure to a patient's body fluids after contact with a dirty area or equipment after extracting PPE. if the hands appear dirty.

4. Personal Protective Equipment (PPE)

PPE should be worn before entering EVD patient care facilities in accordance with the WHO-recommended order and removed before leaving the care facility. Contact with used PPE on any part of the face or fragile skin should be avoided. PPE covers,

- **Non-sterile gloves are the right size**
- **Non-slip and long-sleeved dress**
- **Face shield**
- **Locked shoes that prevent piercing and intrusion**

5. Patient placement and management

Suspected or certified EVD patients should be kept in isolation and if possible kept in a single room. Otherwise they must be placed in beds with a gap of at least 1m in between. Visitors should have no restrictions other than those necessary for the patient's well-being as a parent.

Management of used equipment and other items

It is recommended that equipment such as stethoscopes be refined and disinfected before reuse, if different equipment is not available. Parental equipment, surgical blades, syringes and needles should not be reused. They should be discarded in barrels that are resistant to piercing. All solid non-solid waste should be disposed of in non-leaky bags or bins.

Used linen should be collected from non-perishable bags stored during use. They should be washed with water and detergent, rinsed, soaked in 0.05% chlorine for 30 minutes and then dried.

All barrels must remain upright and must be closed when ¾ is full. Before being removed from the wards the outer surfaces of these containers should be disinfected using 0.5% chlorine.

1. Clean the environment

Cleaners should wear heavy rubber gloves, and non-slip, non-slip rubber boots over PPE. Water and cleaning should be used to clean work areas and the floor of the hospital. This should be done at

least once a day. Some dirty areas and contaminants should be cleaned and disinfected using 0.5% chlorine.

2. Biological management

Performing autopsies, post-mortem biopsies and other laboratory tests of certified EVD tissue samples or suspected patients should be minimised and should only be performed by qualified personnel. Full PPE should be worn during template handling. All specimens should be submitted with clearly marked, non-leaky, non-breakable containers, with an antiseptic exterior.

Carcasses should never be washed or embalmed. They should be sealed in two bags, disinfected with 0.5% chlorine and buried immediately. Some cultural and religious practises can be changed if necessary, but body care should be kept to a minimum and full PPE should be worn at all times.

3. In the case of exposure to infected body fluids

All current operations should be safe and dry immediately and PPE should be safely removed. Affected skin should be washed with soap and water and any affected pores such as conjunctiva should be washed with plenty of running water. The person should be tested for fever and other symptoms for 21 days.

4. Pathogenesis

The pathogenesis of the Ebola virus shows similarity to that of most other filoviruses that include immunosuppression, increased vascular permeability and coagulopathy. The Ebola virus enters the scrotum even through skin scratches, either through mucous membranes or by accidental injection. The virus enters monocytes, macrophages and dendritic cells and is carried by lymphatics to circulation. It then spreads to the liver and spleen to infect tissue macrophages and fibroblastic reticular cells. The main cellular targets of this virus are macrophages, dendritic cells and kupffer cells. The Ebola virus shows an interaction between a variety of cellular proteins which is why the infection is characterised by broad tissue and organ tropism.

5. Immunopathology

In many cases of the virus, the immune system plays a key role in controlling the spread of the virus. However the tissues and organs of the fatal EVD cases show less inflammation, which raises the damage to the immune response.

It has been found that the proteins of the structure of filo viruses e.g. VP24 (Virion protein) and VP35 inhibit interferon reactions and thus avoid the host's natural defences. As previously mentioned, apoptosis of natural killer cells and T lymphocytes was revealed in histopathology describing the suppression of dynamic immune responses.

As with most complex phones, the Ebola virus infection also causes significant release of pro-inflammatory and vasoactive substances. Even if pro-inflammatory mediators promote

inflammation and inflammation, the spread of the infection system is not effectively controlled. This is due to vasodilation connected by active ingredients.

6. Endothelial dysfunction and coagulopathy

The virus attacks endothelial cells and endocardial cells and causes injury (18). This causes internal bleeding, fluid and electrolyte imbalance and cardiovascular failure. Endothelial damage leads to platelet aggregation and use. The increased level of inflammatory factors and increased production of surface tissue factor protein in infected monocytes and macrophages promotes coagulation decay. As a result of hepatocellular damage the production of coagulation factors, fibrinogen, protein C and S also decreases. Other social and economic problems associated with the Ebola virus epidemic

In view of the current outbreak, in addition to the large number of lives that have been claimed by the disease, it has created many other serious problems not only in Ebola-affected countries, but also in other African countries.

Agriculture contributes significantly to the African economy. As more and more farmers die of the disease and many leave their farms for fear of contracting the disease, there is a severe shortage of workers in these countries and a decline in food production. The emergence of food shortages in the near future is predicted by experts.

Chocolate companies and many other industries are particularly affected by the shortage of workers. Nigeria and Ivory Coast are the largest cork producing countries but most of the workers are from Liberia and Guinea. International companies such as Nestle and Mars have introduced education and fundraising programs to prevent the spread of the virus to cork workers.

Many schools have been closed because of a deadly epidemic that has swept across the country. Apart from the impact on education, the child support system in government has stalled as a result.

Tourism is another area affected by the epidemic. Although Africa is a larger continent than Europe, the USA and China combined; visitors often see it as a single country since the Ebola epidemic broke out. For example, Tanzania, a popular wildlife sanctuary, is an East African country, located more than 6,000 miles from the Ebola-affected area. Tanzanian hotels reportedly lost 50% of bookings in 2015.

Many African countries refused to host international events and conferences because of the risk of the Ebola outbreak. For example, Morocco, the host of the Africa Cup of Nations, scheduled for January 2015, is calling for a postponement. The government says, "There is no way we can be serious about the health and safety of Moroccan citizens."

Also Read:

- Expository Essay on Leadership in 800-850 words | for 6-12 | Free Pdf
- Expository Essay on Science and Technology in 900-1000 words | Free Pdf