



INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND BIO-SCIENCE

SUPER VIRUS DEADLIER THAN AIDS: EBOLA

AJINKYA B. CHAVAN, NAWAJ BAXU, SUPRIYA C.PATIL, AMAR P. PATIL, R. M. CHIMKODE

SANT GAJANAN MAHARAJ COLLEGE OF PHARMACY, MAHAGAON.

Accepted Date: 15/03/2015; Published Date: 27/06/2015

Abstract: Last year's Ebola hemorrhagic fever seen in African country. It is widely increasing in East Africa. This very harmful virus because it spread through diet, environment, personal contact. It is mostly grows in cool environments. It is very difficult to developed the vaccines and drugs but American scientist developed vaccines i.e. Ebola vaccine these vaccine are positive result in animal such as monkey but not used in human beings .as CDC the death rate of EHF is 90% for this reason it is more danger virus than AIDS. According to WHO In case of AIDS 1.6 million people world wise died HIV virus attack on person's immune cell and weakens the system that means it kill the WBCs but now a days it is cure because number of drugs treatment therapy is available in market for prevent the HIV virus but in EHF no any treatment are available that's why it is more deadlier than AIDS. **Background of Ebola virus:** Ebola virus is a acute viral infections or illness with death rate is 70 to 90% than Rabies and AIDS no any 1 virus that death rate is 90% and cause high hemorrhage fever. EHF is a 1 of 2 genera of family Filoviridae. The main symptoms are fever, vomiting, headache, joint or muscle pain, sore throat, diarrhea, bleeding, neurological pain for these reasons patient die within 6 to 9 days after attack of this virus. In 1976 developed 1 species of genus, "Reston Ebola virus" is packed in aerosol types of container and it use to with spray but it is non pathogenic to human. **Keywords:** Ebola virus, HIV virus, Ebola hemorrhagic fever, vomiting, Mode of transmit ion of disease.



PAPER-QR CODE

Corresponding Author: MR. AJINKYA B. CHAVAN

Access Online On:

www.ijprbs.com

How to Cite This Article:

Ajinkya B. Chavan, IJPRBS, 2015; Volume 4(3): 7-17

INTRODUCTION

Virus is a non-cellular particle which is made up of protein and genetic material. EHF is 1st seen in African country. The family of Ebola virus is *Pteropodidae* are considered to be natural host of the Ebola virus. EHF is typically occurs in tropical regions of Saharan Africa, It is transmitted to humans population from wild animals and spread through person to person transmission. The EHF has enthralled the global interest due to its lethal prospective. The death rate of EHF is 90% for these reason the diagnostic study and research is ongoing on preventing and making of vaccine to kill this virus. Intensive supportive care is required for EHF affected patient or persons.

According to WHO world wise death ratio is find out it is nearly about 1.6 million in case of AIDS but in case of Ebola is 80 to 90% death rate this is big difference than other disease and other virus. AIDS mostly affect the human immune system and kill the WBCs and for this reason the count of WBCs is low due to these reason the strangeness activity of human is totally low and patient become fully weakness and full to action against any disease due to low immunity. Today's people used antiretroviral therapy to protect the HIV but in case of EHF no chance because no any specific treatment available than other disease.

In Africa country the dogs are not fed and have to scavenge for their food. The dogs sometimes eat small dead animals they found near the forest and villages and also eat internal organ of dead animals such as wild animals. EHF is feebly transferred through that meet which infected to Ebola virus. The African people sometimes use these types of meet that included beef meet etc.

The detection of EHF by PCR test it is special test for diagnosis of EHF we can find out within 5min the person suffering from EHF or not EHF is appears in reservoir species it extend throughout central Africa it is most seen in both rural and urban areas and might therefore be a small mammal or flying animal i.e. bat or bird. In 1976 outbreaks of EHF observation in democratic republic of Congo and Sudan identified bats as a potential reservoir. The EHF virus nucleotide sequences and which contains capsid with the help of capsid it is directly attack on cell and penetrate with the help of spines body.

The virus are living or nonliving organism a virus is a non cellular particle which is made up of protein and genetic material that can invade living cell the size of EHF virus or disease is 970nm. EVD is 1 of numerous viral hemorrhagic fever and is rare and deadly spreads through unprotected contact with blood secretions, direct contact of infected needle, that have been contaminated. It is spread through health care workers, families and friends who take care of someone with Ebola and have direct contact with their body fluids and secretions it is previously known as HF (High fever) or EHF is sever condition caused by a virus belonging to

Genus –*Ebolavirus*

Family- *Filoviridae*

These five viruses are-

Bundibugyo virus (BDBV),

Ebola virus or Zaire *ebolavirus* (EBOV)

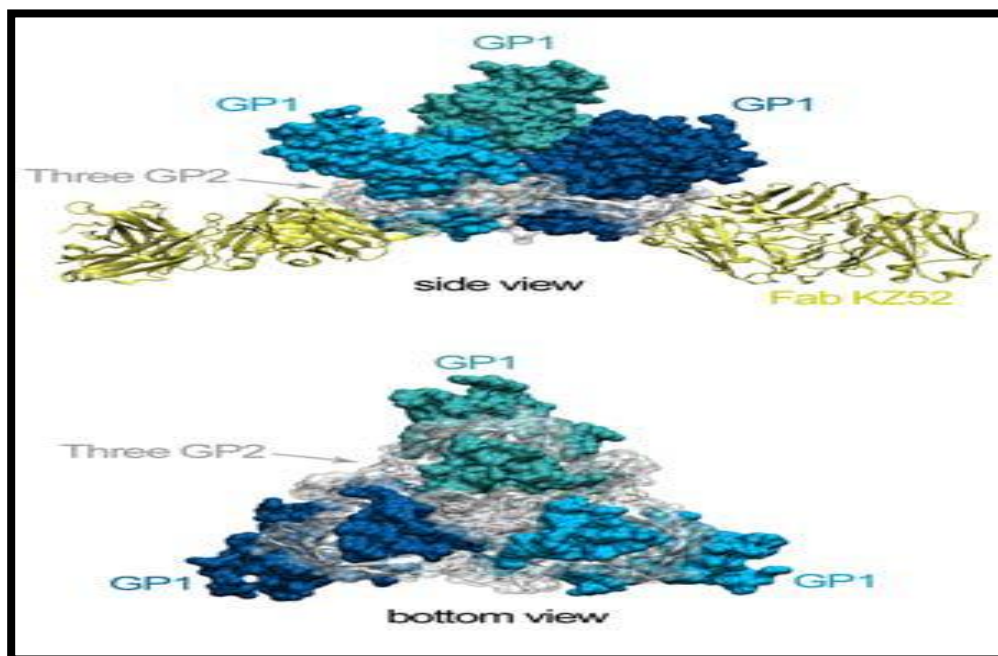
Sudan virus (SUDV)

Tai Forest virus (TAFV)

Reston virus (RESTV)

Structure:

Fig 1: Structure of Ebola virus showing GP protein:



The Ebola virus disease cause a severe bleeding due to cell damage it is called as hemorrhagic fever with fifty to ninety percent lethality for which no vaccines or treatment are available. The fig indicate that crystal structure of the oligomeric, and antibody complex called as glycoprotein which derived from a human survivor clinically the glycoprotein is termed as GP, medicates host recognition; drives fusion of the virus and host membranes and make itself from immune surveillance. The structurally the antibody that neutralize the virus are so rare,

which a neutralizing antibody might bind it identifies very few sites. It provided templates for vaccines and antibodies against the EVD virus. The glycoprotein that is GP is main protein which is responsible for attachment and enters in new host cell shielding of the maintenance of virus stability between the hosts. For development of vaccine and drug and understands the structure and concept of GP having its capsid movement and its required food which responsible for fast development and grow of virus. The virus is a surface forms can be difficult to achieve as they are oligomeric, metastable and heavily glycosylated. The molecular weight of EVD virus is comprised of heterogeneous carbohydrate and unsaturated polypeptide. Marnie Fusco and Erica Ollmann Saphire of The Scripps Research Institute was able to crystallize the trimetric, perfusion form of GP, in complex with a neutralizing antibody derived from a human survivor of the 1995 Kiewit, Zaire outbreak. It has grow ~50,000 crystals for screen and project and 800 large crystals over ~ 30 trips to ALS and SSRL it is useful to find 1 crystal that diffract to 3.4 Å and permit structure determination. The glycoprotein crystal required for attachment, fusion and entry. EVD is pseudo type virus with the crystallization construct plus the transmembrane domains are functional in infectivity assays and exhibit antibody neutralization profiles identical to wild-type GP.

Fig 2:Map of ebola virus where it is most affected area in africa:



This Congo/Gabon Red border area has highest frequency of EVD outbreaks. Kikwit and Yambuku are not so far from that region, suggesting that other parts of Congo (Shanghaied Likouala) provinces may experience outbreaks sometime in the future. History of EVD is difficult to establish because of cultural backdrop. Ebola might break out in the Kinshasa/Brazzaville cities where it is most spread and round about 12 million people live in this area.

Transmission:

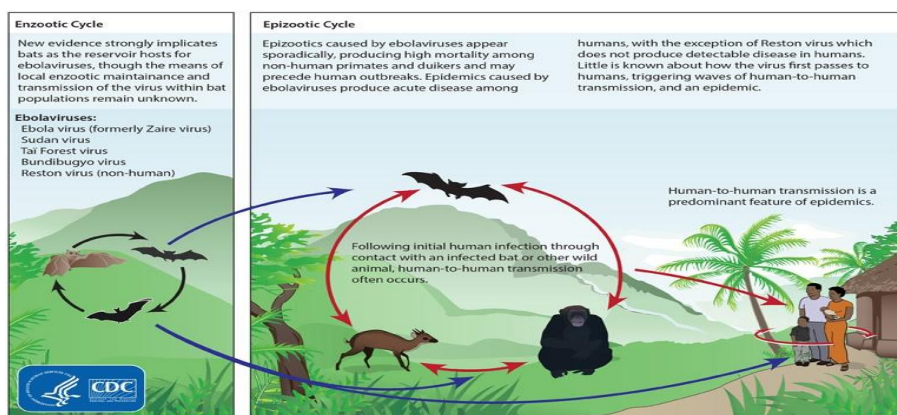
Because the natural reservoir of EVD has not yet been proven the particular manner in which virus first affected in a human at the start of an outbreak is unknown. The researchers have hypothesized that the 1st patient infected through contact with an infected animal. Following are number of reason which causes the EVD.

- In case direct contact with the body secretions or blood of an infected person.
- Exposure to objects like needles that have been contaminated with infected body sweat and secretions.

The EHF virus is spread through friends and families because they are very close in come contact with infectious secretions when caring for ill persons.

The outbreaks of Ebola HF, the disease can spread fast or quickly within health care settings such as a clinic or hospital. Ebola viruses can occur in health care settings where hospital staff and doctors are not wearing protective equipment, like gloves, masks, and gowns. Sanitization is carefully maintained and proper cleaning and disposal of instruments like syringes, and needles is also important. In case of instruments are not disposable, they must be clean with help of sterilization chemicals in case of words fumigation must be necessary and sterilized before being used again. Ebola virus disease is transmitted through direct contact with virus-containing body fluids or secretions like, blood, vomits, urine, feces, and possibly sweat from a person who developed signs and symptoms of illness. It is also spread by contact with infected animals or contaminated objects. The unlike contagious illnesses like measles or influenza Ebola virus disease has not been demonstrated which can spread by the respiratory site or route and therefore EVD is not spread through casual contact in schools, markets, or trains /buses etc. EVD is not transmitted by mosquitoes.

Fig 3: Life cycle of Ebola virus:



Incubation period: The incubation period of Ebola Virus is 2-21 days.

Signs and Symptoms :

- Fever
- Headache
- Joint and muscle aches
- Weakness
- Diarrhea
- Vomiting
- Stomach pain
- Lack of appetite

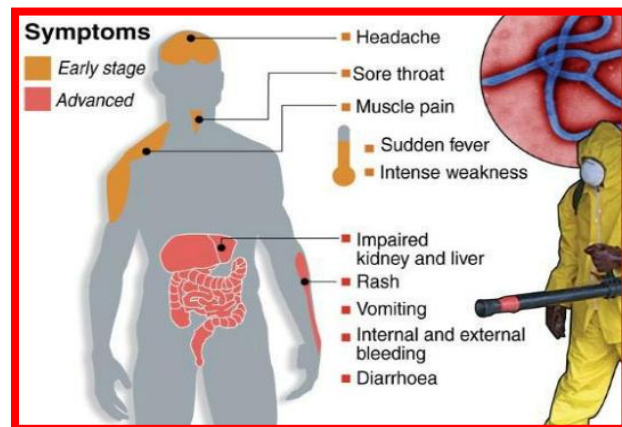
- A Rash
- Red Eyes
- Hiccups
- Sore throat
- Chest pain
- Difficulty breathing
- Difficulty swallowing
- Bleeding inside and outside of the body

Fig 4 : symptoms of Ebola virus

The symptoms are divided into two phases:

1: **Early phase:** Headache, sore throat, muscle pain, sudden fever, intense weakness etc

2: **Advance phase:** Impaired kidney and liver, Rash, Vomiting, Internal and external bleeding, Diarrhea etc



Characteristics:

It has Non living structure and non cellular it contain a protein coat called the capsid and have a nucleic acid core containing RNA or DNA capable of reproducing only when inside a host cell which are present in Some viruses are enclosed in a protective envelope some viruses may have spikes with help of spikes it is directly attack on cell and penetrate in to the cell most viruses infect only specific host cell.

Diagnosis:

Diagnostic test Ebola virus or EHF is an individual who has been infected for only a few days is difficult, because the early symptoms like fever, headache, weakness, vomiting, redness of eyes and skin rash etc its nonspecific to Ebola virus infection and is seen often in patients with more

commonly occurring diseases Japanese scientist discover primer test for diagnosis of Ebola virus within 30 mins. Other test like ELISA test.

Preclinical study:

The Ebola virus injected into monkey and mice. This study reports shows that they are cured from Ebola virus infection.

Clinical Trial: There are no true results from human beings.

Treatment:

THE Standard treatment for Ebola virus is still limited to supportive therapy.

It include following steps:

- Balancing the patient's with the help of electrolytes and fluids
- For Maintaining Blood pressure oxygen supply is necessary its use full to also maintain respiration.
- Treating them for any complicating infections.

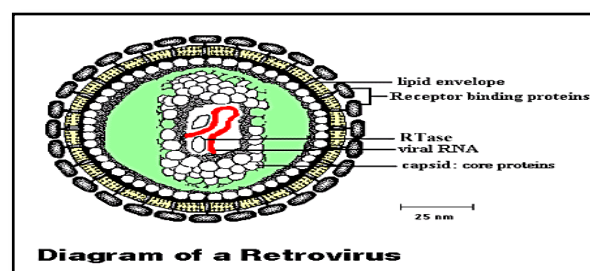
Prevention: Protect from Ebola virus should Wearing of protective clothing like masks, gloves, gowns, and goggles etc.

1. Must use of infection-control measures like complete equipment Sterilization and routine use of disinfectant such as Detol, and spirit,etc
2. The Isolation of EHF patients from contact with unprotected persons.

HIV:

HIV, the AIDS virus, is a Retrovirus .The feline leukemia virus is also a retrovirus .The enzyme reverse transcriptase or RTase, which cases synthesis of a complementary DNA molecule cDNA using virus RNAas a templat.

Fig 5: Structure HIV virus:



Characteristics of retroviruses:

It contains RNA, not DNA family- Retroviridae contain enzyme called Reverse transcriptase. When a retrovirus infects a cell, it injects its RNA and reverse transcriptase enzyme into the cytoplasm of that cell.

Treatment:

- Abacavir (Ziagen, ABC)
- Didanosine (Videx, dideoxyinosine, ddl)
- Emtricitabine (Emtriva, FTC)
- Lamivudine (Epivir, 3TC)
- Stavudine (Zerit, d4T)
- Tenofovir (Viread, TDF)
- Zalcitabine (Hivid, ddC)
- Zidovudine (Retrovir, ZDV or AZT)

WHY EBOLA IS DEADLIER THAN AIDS?

The EHF is the enemy knocking at the door of many African countries and its effects are very fast spreading. than other viruses, like HIV, Hepatitis A, B, C, IN casr of HIV and Hepatitis they are stay in the body fluids of an infected person for 15 years no or without any symptoms, the EHF or Ebola virus , which symptoms like bleeding from the mouth and anus, can kill its victims within few days. Community Health Science, University of Ilorin, Kwara State, Tanimola Akande, describes the Ebola virus in different cases they show the disease state and finally they concluded the mode of transmission of disease is the major reason for deadlier than HIV virus also in other virus. He says, "That Ebola has no cure is not the reason why it is deadly.HIV also has no cure, yet it does not kill all its victims, if it is properly managed. Ebola is deadlier because it is easy to contract; it is in all the body fluids of an infected individual as its infection can be through saliva, blood, sweat, sperm, excreta, body tissue. It can also be contracted by touching the surface an infected person has touched."Also, the natural host for Ebola is fruit bats, chimpanzees and other forest animals that many eat daily in different parts of the country. You can get it just by coming in contact with the blood of an infected animal. Any virus that can be contracted through food has the potential to wipe off many lives."

The physician, who says that Ebola virus has very tricky symptoms, which often mimic that of common illness, such as malaria, dengue, Lassa and typhoid fever, notes that many health workers may have already come in contact with an infected patient without knowing it.

He adds, “When a patient comes to your hospital and presents you with symptoms, such as fever, headache, general body pain, you are likely not to wear gloves or biohazards suits before treating the patient. That is the tricky part. You are infected before you know it is Ebola.”

To contain the transmission of the disease, Akande urges Nigerians to stop eating bush meat, as well as to wash their hands and fruits regularly before eating. He also advises health workers to wear protective kits always while attending to their patients.

Akande states, “We have been talking about HIV/AIDS, but Ebola is deadlier than HIV/AIDS. People who have HIV live for years if they take their drugs but any contact with an infected Ebola person is almost a death sentence because the virus has no vaccines, and no drugs. The best one can get is only palliative management”.

Ebola is the nightmare virus. It is feared as the second coming of the plagues of the 1400s. Why is this one virus so much more deadly than other viruses?

Simply put, experts list five reasons why everyone must watch out for this virus.

1: Low survival rates:

The case of EHF chance of survival is almost zero, in African country it kills 90 % of those infected with the Ebola virus. The main tread mark of disease is bleeding from mouth and anus. In case of a medical point, any one that contracts this disease should be isolated –to wait for death! It is sad! It kills faster than AIDS, and in an equally dramatic way. Because of its mode of transmission, you cannot bury dead patients in the usual way — patients, dead or alive, are absolutely avoided! Dead bodies are equally infectious.

2: It is almost incurable:

The problem is that there is no drug for treatment or vaccine for protect or cure or prevention. 4 different viruses cause this disease. In case of other we have drugs for HIV/AIDS patients, to help them live longer and better. The treatment offered for Ebola Virus Disease is for the person to die better and more peacefully. The vaccines we have can only prevent monkeys and mice from the disease! Antiviral do not work.

3: It is highly contagious:

AIDS/HIV requires blood intimate contact for transmission; that is the disease requires contact with body. Transmission is by coming in contact with body fluids from diarrhea, vomiting, and bleeding. Doctors and medical staff attending to the patients wear protective kits from head to toe, making them look like astronauts heading for the moon! HIV is highest among commercial sex workers and gays; the people with the highest risk of Ebola Viral Disease are medical workers, their families, and their friends. Hunters that encounter monkeys and bats, and marketers of bush-meats should be careful.

3: No definite way to protect yourself:

There is ABC of HIV/AIDS prevention. There are ways of preventing malaria. But preventing Ebola Virus Disease is not specific or clear-cut. You are advised to wash your hands frequently with soap and water, avoid contact with infected people (and their secretions and blood), and avoid contact with objects contaminated by infected people. Prevention is by hygiene!

Laboratory Investigation:

EHF virus-specific immunoglobulin (IgE) G when the person infected from EHF we can detect with 10 min the person suffering from EHF or not with help of primer test it is also called as ELISA test was detected by using a standard enzyme-linked immune sorbent assay method as previously described (8). Briefly, Maxisorp plates (VWR International) were coated with Ebola virus-Z antigens diluted 1:1,000 in phosphate buffered saline (PBS), overnight at 4°C. Control plates were coated with uninfected Vero cell culture antigens in the same conditions.

CONCLUSION:

The study offers the 1st evidence that is no any commercially available Ebola vaccines. However, recombinant human monoclonal antibody used directed against the envelope GP of Ebola has been demonstrated to possess neutralizing activity. This Ebola virus disease neutralizing antibody mostly useful in vaccine development or as a passive prophylactic agent. Even though scientists have recently made breakthroughs there is still need for extensive research to find vaccines and cures for this deadly virus than the AIDS.

REFERENCES:

1. <http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/ebotabl.htm>
2. <http://www.who.int/mediacentre/factsheets/fs103/en/>

