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EBOLA VIRUS DISEASE (EVD): clinical presentation and management on the field

Nicola Petrosillo

National Institute for Infectious Diseases "L. Spallanzani"-Rome, Italy

overview of Ebola VIRUS DISEASE

What is Ebola?

- A virus belonging to the Filoviridae family of thread-like viruses
- Five strains are known to cause human illness (Zaire, Sudan, Tai Forest, Bundibugyo & Reston)
- Causes the acute viral illness known as Ebola virus disease
- Common in Africa: DRC, Sudan, Uganda also reported in Ivory Coast

How is it transmitted?

- Transmitted to people from wild animals (especially bats & non-human primates) and spreads in the human population through human-to-human transmission
  - Close contact with the blood, secretions, organs or other bodily fluids of infected people; and formites
  - Contact with the body of the deceased person
  - Contacts with infected semen up to seven weeks after clinical recovery

- Nosocomial infection in health facilities due to close contact without the use of correct infection control precautions and adequate barrier nursing procedures

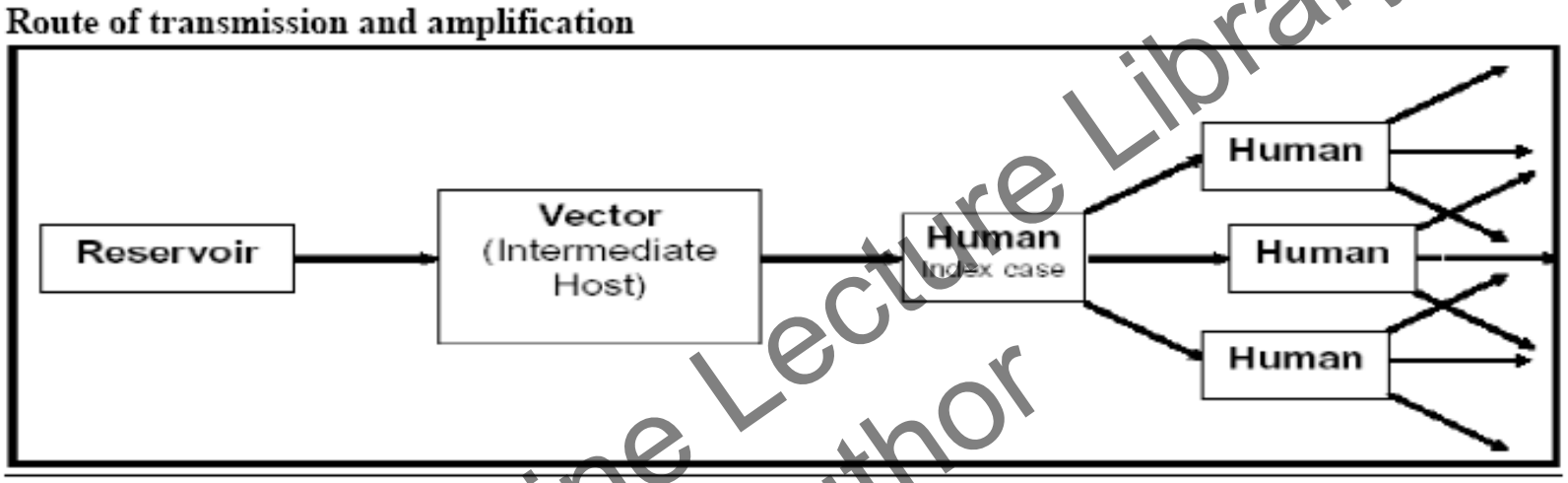
What is infectious?

Ebola is spread through direct physical contact with body fluids like:

- Blood
- Saliva
- Stool and urine
- Vomit
- Sweat
- Snot
- Sexual fluids
- Tears
- Breast milk

Also belongings (linen, clothes…) that are touched by a person, sick or dead with Ebola can be infectious.

Ebola – transmission



Natural host: Likely fruit bats

→ intermediate organism: non-human primate

→Human (index case) → Human (= secondary transmission)

hypsignatus monstrosus

How can you get infected?

- Body fluids coming into:
  - The eyes
  - The nose
  - The mouth
  - The sex
  - Wounds in the skin.
- Via your hands or splashes or via using piercing instruments that have been used by an infected person.
- But the virus cannot pass through the skin if there is no wound and is not spread via the air.

Clinical management

- **The provision of medical care to critically ill patients can be challenging in any setting, particularly resource-limited (including health personnel, medical supplies and equipment) remote environments where VHFs tend to occur.**

- **During a VHF outbreak, resource limitations along with the inadequate knowledge and skills for minimizing the risks of transmission to the health workers can lead to the de-prioritization of patient care.**

Health workers have an obligation to provide the best medical care to improve patient survival, but also to provide symptom relief and palliation when required. In the context of patients with VHF, clinical care must be strengthened whilst minimizing the risk of onwards transmission to others, including health workers.

Doing Today's Work Superbly Well — Treating Ebola with Current Tools

- **…after spending much of the past 5 months treating patients with Ebola virus disease (EVD), we are convinced that it's possible to save many more patients.**
- **Our optimism is fueled by the observation that supportive care is also specific care for EVD— and in all likelihood reduces mortality.**

- **A common assumption is that a lack of material resources constitutes**
- **the dominant barrier to clinical care. That is not the case.**

- **Intravenous catheters, fluids, and electrolyte replacement are readily available but thus far are being used much too sparingly.**

- **When patients can no longer drink, placement of an intravenous catheter and delivery of appropriate replacement solutions are required, but we have seen many critically ill patients die without adequate intravenous fluid resuscitation.**

Lamontagne F et al. NEJM 2014; October 4

- **Importantly, inadequate care for VHF patients may also lead to increased reluctance on the part of individuals from the community to identify and isolate possible patients.**
- **This downstream effect makes case finding through community triage difficult and can seriously affect outbreak infection control.**

- **The initial clinical manifestations of Ebola, Marburg, Lassa fever and CCHF infections are non-specific and mimic many common infections making them difficult to diagnose early.**
- **Thus, it is important to understand the case definition and expand your differential diagnosis to include other causes of fever and non-specific symptoms (e.g., malaria, typhoid, upper respiratory infections and urinary tract infections).**
- **Also, despite being called a viral haemorrhagic fever, the clinical presentation of VHF only includes haemorrhage in less than half of confirmed Ebola/Marburg cases**

Diagnosis

- Differential diagnoses:
  - malaria, typhoid fever, shigellosis, cholera, leptospirosis, plague, relapsing fever, urinary tract infections, dengue, meningitis, hepatitis and other VHFs

- Lab confirmation:
  - Enzyme-linked immuno-sorbent assay (ELISA), antigen detection tests, serum neutralization test,
  - Reverse transcriptase polymerase chain reaction (RT-PCR) assay, and virus isolation by cell culture

Tests conducted under maximum biological containment conditions

- **In addition, while there is distinction between early and late clinical signs of VHF, it is important to remember that patients may present at different times in the course of their illness.**
- **Severity of illness may depend on a number of factors including the body's natural immune response, mode of transmission, duration of exposure, infecting dose, phase of illness of the case, and possibly even the virus strain.**

Possible predictors of death

Based on experience in former FHF outbreaks and on anecdotal evidence, there are some indicators and symptoms that can predict a fatal outcome from the disease:

- Early in the epidemic: the symptoms and case fatality rate tend to be worse in the first cases of the outbreak and less severe at the end of the outbreak, possibly due a higher virulence at the beginning of an outbreak.
- High contaminating dose of infectious fluids.
- Late or no appearance of immune globulins.
- Pregnancy: so far no pregnant woman has been reported to survive Ebola or Marburg Haemorrhagic Fever
- < 5 yrs of age
- Fast progression of the symptoms
- Bleeding signs
- Tachypnoea
- Early onset of edema
- MOF (Multiple Organ Failure)

Clinical presentation

- Incubation period: varies between 2 to 21 days
- Signs and symptoms:
  - sudden onset of fever, intense weakness, muscle pain, headache and sore throat
  - vomiting, diarrhoea, rash, impaired kidney and liver function, and in some cases, both internal and external bleeding (not always seen)

- **Despite a common belief that haemorrhage is a defining feature of filovirus disease, visible bleeding is not universal. When present, bleeding is not an early presenting feature, but often only appears in the later stages of filovirus disease.**

- **It may manifest as overt bleeding or a combination of major and minor bleeding signs, but is frequently only minimal and sometimes solely internal (and therefore frequently missed).**

TABLE 2

Early and late clinical features of Ebola/Marburg infection

Early clinical features of Ebola/Marburg[11]

- Intense tiredness, weakness, malaise
- Sudden onset of fever (defined as 38.0˚C axillary)*
- Headache
- Myalgia (muscle pain)
- Arthralgia (joint pain)
- Hiccups
- Conjunctivitis
- Nausea and loss of appetite
- Throat pain and difficulty swallowing
- Abdominal pain
- Diarrhoea (can be bloody or non-bloody)

Note: There is often an overlap of early and late symptoms. Patients often do not develop all the signs and symptoms.

Late clinical features

- Confusion and irritability
- Seizures
- Chest pain
- Diarrhoea (watery or bloody)
- Vomiting (sometimes bloody)
- Skin rash
- Internal and/or external bleeding including:
  - oozing from puncture sites
  - rashes suggestive of easy bleeding ecchymoses, petechiae,
  - dark blood in stool (melena, hematochezia)
  - bleeding from the gums
  - conjunctival haemorrhage (bleeding from the eyes)
  - epistaxis (bleeding from the nose)
  - haematemesis (blood in vomitus) (e.g.,
  - haemoptysis (blood in sputum) purpura)
  - unexplained vaginal bleeding in women
  - haematuria (blood in urine)
- Miscarriage in pregnant woman**
- Respiratory distress
- Shock (see definition of shock in section 4)

*Fever may be absent in late stages

** Pregnant patients with VHF often miscarry. However, vaginal bleeding and miscarriage can occur in any pregnancy. During an Ebola/Marburg or CCHF outbreak, fever with miscarriage or abnormal vaginal bleeding (other than normal menstruation) should prompt a PCR test to rule out VHF.

- **EVD pts may have an haemorragic shock (attention: could be internal) or a septic shock.**
- **Pathophysiology of shock and intensive care for EVD is the same as for bacterial infections, malaria, and other causes of septic shock.**
- **Intensive care support is the only clinical management that can have a positive impact on the clinical outcome.**
- **Shock could be the effect of bleeding + DIC + sepsis..**

Dehydratation

The commonest presentation among EVD pts, due to:

-Fever

-Vomit

-Diarrhea

-Decreased food assumption (anorexia, dysphagia, headac he, abdominalpain).

In these cases, assess skin hydratation and give fluid and oral electrolyte solution, if possible.

Figure 7. Organizational structure of the different committees involved in Ebola or Marburg virus disease outbreak control activities