RWANDA BIOMEDICAL CENTER

A Healthy People. A Wealthy Nation

Epidemic Surveillance & Response Division

GUIDELINES ON RIFT VALLEY FEVER

June 2018

Table of Content

Disclaimer

This guideline is intended for use by healthcare professionals. ESR Division cannot be encountered responsible for any errors or omissions. All healthcare professionals should exercise and apply their own professional analytical decision-making and judgment in interpreting and applying the information presented in this guideline.

1. What is Rift Valley Fever (RVF)?

RVF is a zoonotic mosquito-borne viral disease of domestic and wild ruminants that can cause severe disease in a small proportion of infected humans. The virus is from the family *Bunyaviridae* (genus *Phlebovirus*) and causes outbreaks of abortions and deaths of young livestock (predominantly sheep, goats and cattle). The disease occurs throughout Africa and Middle East Asia when exceptionally heavy rains favour the breeding of the mosquito vectors. Humans become infected primarily from contact with infected tissues of livestock or wild (game) animals, and less frequently from mosquito bites. The mosquitoes which transmit the virus (*Aedes* and *Culex* mosquitoes) are present in Rwanda; however, these species generally prefer to feed on livestock outdoors at night.

2. How is it transmitted to humans?

- Direct or indirect contact with the blood or tissues of infected animals are the most common transmission route. This may include:
    - Handling of animal tissue during slaughtering, butchering or skinning of animals,
    - Assisting with animal births,
    - Conducting veterinary procedures, and/or
    - Disposal of carcasses or foetuses.

- Less common modes of transmission include:
    - Inoculation, for example via a wound from an infected knife or needle-stick injuries or contact with broken skin,
    - Inhalation of aerosols produced during the slaughter/necropsy of infected animals,
    - Bites of infected mosquitoes (most commonly *Aedes*), and/or
    - Consuming raw (unpasteurised or uncooked) milk from infected animals.

- No human-to-human transmission has ever been documented.

Occupational groups such as herders, farmers and farm workers, abattoir workers and veterinarians/animal health workers are at especially high risk of infection.

3. RVF Case definition & criteria for laboratory testing

Suspected case

A person presenting with fever and either myalgia, arthralgia, or headache

OR a person presenting with unexplained encephalitis, hemorrhage, hepatitis, ocular pathology (retinitis), or renal failure with or without fever and has been in last 6 days in area where RVF is known to occur or has been reported.

Probable case

A suspected case with history of close contact with an RVF affected ruminant (Cow, goat and sheep) during the previous 6 days. Close contact includes

- Slaughtering and butchering (traditional or commercial),
- Disposal of carcasses/fetuses.
- Assistance with birthing or other animal husbandry activities resulting in exposure to animal blood and body fluids, and/or
- Veterinary procedures
- Consumption of meat and raw (unpasteurized/uncooked) milk

Confirmed case

A suspected or probable case with laboratory confirmation either by ELISA showing the presence of anti-RVFV IgM or by RT-PCR

NOTE:

1. Consider an RVF affected animal as one confirmed by a veterinarian or by laboratory confirmation
2. Other common causes for these symptoms must be excluded
3. Always fill the investigation form (2 copies, one for the hospital record and another one to send to NRL with the sample) and the line list

4. What are the clinical features in humans?

Typically, illness is asymptomatic or mild in the vast majority of infected persons, with a small proportion experiencing severe disease. The true overall mortality rate following RVF infection is difficult to estimate given that case definitions and laboratory testing methods used in the various documented outbreaks differed significantly. Although the World Health Organization (WHO) Rift Valley fever fact sheet states an overall mortality rate of <1%, mortality rates noted in documented outbreaks range from <1% to 45%. The greatest number of laboratory-confirmed human cases in a single outbreak was recorded in the Saudi Arabian RVF outbreak during 2000, where the case fatality rate was 14.2%.

Mild illness

- The incubation period (interval from infection to onset of symptoms) for RVF varies from **two to six days**.
- Clinically, it presents as a fever with flu-like symptoms (including myalgia, arthralgia and headache).
- Some patients may also develop neck stiffness, sensitivity to light (photophobia), pain behind the eyes, loss of appetite and vomiting; in such patients the clinical presentation may be mistaken for meningitis.
- Symptoms of RVF usually last from four to seven days, after which time the immune response becomes detectable with the appearance of antibodies and the virus gradually disappears from the blood.

Severe illness

A small percentage of patients develop a much more severe form of the disease, which can manifest as one or more of the following complications:

- **Ocular disease (retinitis):** This may occur in up to 10% of infected patients. Onset of retinitis is usually one to three weeks after appearance of the first symptoms (which may be very mild or subclinical), and usually presents as painless blurred or decreased vision, or scotomata. It may resolve within 10 – 12 weeks with no sequelae. If lesions occur in the macula, up to 70% of patients will experience

permanent loss of vision.

- **Meningoencephalitis:** The onset of meningoencephalitis usually occurs one to four weeks after the first symptoms (which may be very mild or subclinical) of RVF appear, and in some cases neurological complications can manifest
  >60 days after the initial symptoms of RVF. Clinical features may include: intense headache, loss of memory, hallucinations, confusion, disorientation, vertigo, convulsions, lethargy and coma. Although the mortality rate in patients who experience only this form of the disease is low, residual neurological deficit, which may be severe, is common.

- **Hepatitis:** This is characterised by markedly raised transaminase enzyme levels (ALT and AST), and may occur together with or precede other complications (e.g. haemorrhage or meningoencephalitis).

- **Renal failure:** Acute renal failure, characterised by elevated urea and creatinine levels, may be secondary to hypovolaemia, multiple-organ dysfunction, hepatorenal syndrome or possibly also direct virus-related injury.

- **Haemorrhagic fever:** Haemorrhagic manifestations appear two to four days after the initial onset of illness, and may present as haematemesis (vomiting blood), melaena (passing blood in the faeces), a petechial /purpuric rash or ecchymoses, bleeding from the nose or gums, menorrhagia, or bleeding from venepuncture sites. Thrombocytopenia is invariably present ± laboratory evidence of disseminated intravascular coagulation (DIC). Most cases also have evidence of hepatitis (markedly raised ALT and AST levels, or jaundice) which may precede the haemorrhagic state. The mortality rate of patients developing the haemorrhagic form of the disease is high (up to 65%).

5. How is it diagnosed in the laboratory?

Live virus or viral nucleic acids may be detected in blood during the early phase of illness or in post-mortem tissue by RT- PCR or isolation in cell cultures or mice. Haemagglutination inhibition assay (HAI) and enzyme-linked immunoassay (ELISA) tests

may confirm the presence of specific IgM and/or IgG antibodies to the virus.

6. Procedure following detection of a suspected case

Step 1: Notify the case

- RVF is a notifiable medical condition and should be notified to ESR through eIDSR

Step 2: Collect specimens for laboratory testing

- All suspected cases of RVF should have TWO clotted blood specimens (either red top tubes or SST-gel tubes which usually have a yellow top) of sufficient volume (±5 ml each) taken for viral detection and antibody determination.
- The specimens should be packaged in accordance with the guidelines for the transport of dangerous biological goods (triple packaging using absorbent material) and transported directly to:
- ALL specimens should be labelled AND accompanied by a fully completed RVF suspected case investigation form (see page 8).

7. How is it treated? Is there a vaccine?

- No specific treatment is available for RVF; management comprises general supportive therapy.
- Early dialysis for patients with renal failure may improve outcome.
- Beware of and promptly treat nosocomial infections, particularly in critically ill patients.
- Ribavirin is NOT recommended for treatment of RVF.
- Moderate to high dose corticosteroids are NOT recommended as adjunctive therapy for RVF.
- Standard infection prevention and control precautions should be followed;
- Patients do not require isolation or barrier nursing. Human-to-human transmission has not been demonstrated.
- Follow-up of patients for at least 1 month after symptoms resolve is advised to monitor for possible development of ocular complications (retinitis in particular) or neurological complications.
- There are no human RVF vaccines for use by the general public.

- Note: Should a patient present with a haemorrhagic fever where both RVF is differential diagnoses, manage as possible RVF until laboratory test results are available:
    - Implement appropriate infection prevention and control measures (including isolation and barrier nursing);
    - Start treatment with ribavirin as soon as possible; and
    - Notify laboratory ESR, collect full blood sample/specimens and send immediately to NRL.

8. Infection prevention and control in healthcare settings

Although no human-to-human transmission of RVF has been demonstrated, there is still a theoretic risk of transmission from infected patients to healthcare workers through contact with infected blood or tissues. Healthcare workers caring for patients with suspected or confirmed RVF should implement "Standard Precautions".

"Standard Precautions" define the work practices that are required to ensure a basic level of infection control, and are recommended in the care and treatment of all patients regardless of their perceived or confirmed infectious status. They cover the handling of blood (including dried blood), all other body fluids, secretions and excretions (excluding sweat), regardless of whether they contain visible blood, and contact with non-intact skin and mucous membranes. A two-page reminder with checklist can be downloaded at www.who.int/csr/resources/publications/EPR_AM2_E7.pdf

9. How can RVF be prevented?

Public health education and risk reduction plays a vital role in preventing human infections. Messages to the community, especially within affected areas should focus on:

- Avoiding high risk animal husbandry procedures and slaughtering practices through the use of gloves and other protective clothing, especially when handling sick animals.
- Avoiding the unsafe consumption of fresh blood, raw (unpasteurised or uncooked) milk or animal tissue. In outbreak regions, all animal products (blood, meat and milk) should be thoroughly cooked before eating. Slaughtering of sick animals for consumption should be discouraged during outbreaks.
- Personal and community protection against mosquito bites through the use of insect repellents (containing 30-50% DEET), insecticide-treated bed nets, and wearing of light-coloured clothing.

10. How are outbreaks prevented or mitigated?

Prevention of RVF outbreaks primarily relies on the prevention of infection in livestock through vaccination. Other ways in which to mitigate the spread of RVF involve control of the vector and protection against their bites. Larviciding measures at mosquito

breeding sites are the most effective form of vector control if breeding sites can be clearly identified and are limited in size and extent. During periods of flooding, however, the number and extent of breeding sites is usually too high for larviciding measures to be feasible.

11. Reference

1. World Health Organization. Rift Valley Fever. www.who.int/mediacentre/factsheets/fs207/en/.

2. Centers for Disease Control. www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/rvf.htm.

12. Rift Valley Fever (RVF) suspected case investigation form, June 2018

To be filled out and send to NRL for human RVF testing.

Patient details			
1. Case identification (Name):			
2. Date of Birth:		3. Gender: □ M □ F	
4. Contact number:			
5. Occupation:		6. Name of farm:	
7.District:	Sector:	Cell:	Village:
Consultation/admission details			
8. Name of the clinician:		9. Phone number:	
10. Facility name:			
11. Date of first consultation: DD / MM / YYYY			
12. Admitted to hospital? □ Y □ N If yes, duration of hospital admission (days)?		13. Required icu care? □ Y □ N If yes, duration of icu care (days)?	
Clinical details on first presentation/admission			
14. Past medical history: Underlying illness? □ Y □ N … If yes, what? Immunosuppression? □ Y □ N … If yes, give Details?			
15. Date of onset of rvf illness? DD / MM / YYYY			
16. SYMPTOMS (tick all that apply): □ FEVER □ MYALGIA □ ARTHRALGIA □ FATIGUE / MALAISE	□ LOSS OF APPETITE □ NAUSEA □ VOMITING □ ABDOMINAL PAIN □ NECK STIFFNESS	□ HEADACHE □ OCULAR PAIN □ PHOTOPHOBIA □ BLURRED VISION □ LOSS OF VISUAL ACUITY	□ CONFUSION □ HAEMORRHAGE If yes, SITE/S:
17. EXAMINATION ON PRESENTATION	□ DEHYDRATION □ JAUNDICE □ PALLOR	□ MENINGISM □ CONFUSION □ RETINITIS	□ HEPATOMEGALY □ ABDO TENDERNESS

(tick all that apply): □ FEVER (≥ 38°C) □ SHOCK (↓BP)			□ RASH
□ **18. HAEMORRHAGE** If yes, tick sites that apply:	□ EPISTAXIS □ HAEMATEMESIS □ MELAENA	□ MENORRHAGIA □ PETECHIAE BLEEDING FROM VENEPUNCTURE SITES	□ BLEEDING ELSEWHERE? Specify:
19. List other clinical findings?			
Clinical progression			
20. Clinical progression to date? □Uneventful recovery or □ Developed complications ... If developed complications, tick all that apply: □ ELEVATED TRANSAMINASE LEVELS (AST, ALT) □ LIVER FAILURE □ RENAL FAILURE □ THROMBOCYTOPENIA □ HAEMORRHAGE □ RETINITIS □ ENCEPHALITIS			
21. OUTCOME: □ ALIVE □ DIED … If yes, DATE OF DEATH?			
22. Exposure (tick all that apply)			
□ CONTACT WITH ANIMALS/ TISSUES □ DRANK UNPASTEURISED MILK □ CONSUMED ANIMAL MEAT NOT SOURCED FROM RETAIL OUTLET □ MOSQUITO BITES	DATE OF EXPOSURE? ……../……/…… DD / MM / YYYY DESCRIPTION OF EXPOSURE:		