

HEALTH WORKERS GUIDELINES

ON

RIFT VALLEY FEVER (RVF)

Developed by:
The National Institute for Communicable Diseases (NICD)
A division of the National Health Laboratory Service (NHLS),

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Introduction

There is currently an ongoing outbreak of RVF affecting sheep, goat and cattle farms within Free State (FSP), Northern Cape (NCP), Eastern Cape (ECP), Western Cape (WCP), North West (NWP), Gauteng (GP) and North West (NWP) Provinces.

As of 9 April 2010, the NICD has confirmed a total of 111 human cases (81 cases from FSP, 22 cases from NCP, 7 cases from ECP and 1 case from NWP), including nine fatalities. The majority of cases report direct contact with RVF-infected livestock through occupational exposure, including: farmers and farm workers, animal health workers, abattoir workers and meat inspectors. Outbreak investigations by the Department of Agriculture, Forestry and Fisheries and Department of Health are ongoing, and are being supported by the South African Field Epidemiology and Training Programme (SA-FELTP) and NICD.

Disclaimer

This material is intended for use by healthcare professionals. While the greatest care has been taken in the development of the document, the National Department of Health and the National Institute for Communicable Diseases do not accept responsibility for any errors or omissions. All healthcare professionals should exercise their own professional judgement in confirming and interpreting the findings presented in the guidelines.

1. What is Rift Valley Fever?

Rift Valley Fever (RVF) is a viral zoonosis that can cause severe disease in a low 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). Humans become infected from contact with infected tissues of livestock, and less frequently from mosquito bites. The mosquitoes which transmit the virus (*Aedes* and *Culex* mosquitoes) are present in South Africa; however, these species generally prefer to feed on livestock outdoors at night. The disease occurs throughout Africa and Middle East Asia when exceptionally heavy rains favour the breeding of the mosquito vectors.

2. Has South Africa been affected in the past?

Yes. The last major outbreak of RVF on the interior plateau of South Africa occurred in 1974-76 during prolonged heavy rains, causing 10,000 to 20,000 human cases. Since then, sporadic outbreaks and human infections have been documented within KwaZulu-Natal, the Kruger National Park, Limpopo, Gauteng, North West, and Northern Cape Provinces.

3. How is it transmitted to humans?

- Direct or indirect contact with the blood or tissues of infected animals, including:
 - handling of animal tissue during slaughtering or butchering,
 - assisting with animal births
 - conducting veterinary procedures
 - disposal of carcasses or foetuses
- Uncommon 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 of infected animals
 - bites of infected mosquitoes (most commonly *Aedes*): at present, there is no evidence for this mode of transmission in the current outbreak.
- Although very rare, there is evidence that humans may also become infected with RVFV by ingesting unpasteurised or uncooked milk of infected animals.
- No human-to-human transmission has ever been documented.

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

4. When should RVF be suspected? Case definition and criteria for laboratory testing

Any person reporting recent close contact with livestock in or from suspected RVF-affected areas, presenting with:

- Influenza-like illness (which may include fever, myalgia, arthralgia or headache), **OR**
- Fever and features of: encephalitis, haemorrhage, hepatitis and/or ocular pathology (retinitis).

****Precautions – other causes for these symptoms must be excluded where appropriate**, including malaria, Crimean Congo Haemorrhagic Fever (CCHF) and Tick-Bite fever. Obtaining a thorough history including other signs and symptoms, recent travel, insect (e.g. tick) exposures, contact with livestock, etc. will assist clinicians in narrowing the differential diagnosis.

5. What are the clinical features in humans?

Typically, illness is asymptomatic or mild in the vast majority of infected persons. Severe disease occurs in <1% of infected persons.

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 or 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, but the overall mortality rate is <1%. Complications include ocular (retinal) disease (0.5-2% of patients), meningoencephalitis (<1%), hepatitis, or haemorrhagic fever (<1%). The mortality rate of patients developing the haemorrhagic form of the disease is high (50%).

- **Ocular disease (retinitis):** Onset of retinitis is usually one to three weeks after appearance of the first symptoms, and usually presents as blurred or decreased vision. It may resolve within 10 – 12 weeks with no sequelae. If lesions occur in the macula, ±50% of patients will experience a permanent loss of vision. Death in patients with only the ocular form of the disease is uncommon.

- **Meningoencephalitis:** The onset of meningoencephalitis usually occurs one to four weeks after the first symptoms of RVF appear. Clinical features may include: intense headache, loss of memory, hallucinations, confusion, disorientation, vertigo, convulsions, lethargy and coma. Neurological complications can appear later (> 60 days). 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 enzymes (ALT and AST), and may occur together with other complications (e.g. haemorrhage or meningoencephalitis).
- **Haemorrhagic fever:** Manifestations appear two to four days after the initial onset of illness. Usually, evidence of severe liver impairment (such as jaundice, or elevated liver enzyme levels) is present, followed by haemorrhage. This 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, and bleeding from venepuncture sites.

6. How is it diagnosed in the laboratory?

The virus 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. Enzyme-linked immunoassay (ELISA) may confirm the presence of specific IgM and/or IgG antibodies to the virus. These tests are performed by the Special Pathogens Unit, NICD.

7. Procedure following detection of a suspect case

Step 1: Notify the case

- RVF is a notifiable medical condition and should be notified to your local Department of Health telephonically.

Step 2: Collect specimens for laboratory diagnosis

- All suspected cases of RVF should have both a clotted blood (red/yellow top tube) and EDTA blood (purple top tube) specimens taken for viral detection and antibody.
- 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:

**The Special Pathogens Unit
National Institute for Communicable Diseases (NICD)
No. 1 Modderfontein Rd
Sandringham, 2131**

- The specimen/s should be accompanied by the RVF specimen submission form (available at www.nicd.ac.za).
- Samples should be kept cold during transport.

Should you require any clinical advice, or identify a patient with severe illness, please call the NICD Hotline 082-883-9920.

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

- No specific treatment is available for RVF; management is aimed at general supportive therapy.
- Ribavirin is not recommended.
- Standard infection control precautions should be followed; patients do not require isolation or barrier nursing. Human-to-human transmission has not been demonstrated (see section on infection control).
- Continual follow-up of patients for a 1 month period after symptoms resolve is necessary to monitor the possible development of retinal lesions.
- There are no human RVF vaccines registered in South Africa for use by the general public.

9. Infection control in healthcare settings

- Although no human-to-human transmission of RVF has been demonstrated, there is still a theoretical 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.

10. How can RVF be prevented?

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

- Avoiding high-risk animal husbandry procedures and slaughtering practices through use of gloves and other protective clothing, especially when handling sick animals.
- Avoiding the unsafe consumption of fresh blood, raw milk or animal tissue. In epizootic regions, all animal products (blood, meat and milk) should be thoroughly cooked before eating. Slaughtering of 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.

11. How are outbreaks prevented or mitigated?

Prevention of RVF outbreaks primarily relies on the prevention of infection in livestock through vaccination and vector control. Farmers and veterinarians may refer to the Veterinary Control Guidelines. A veterinary (animal) vaccine is available in South Africa. 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.

12. Where can I get more information?

- Regular updates and these guidelines are available through the NICD website (www.nicd.ac.za).
- Questions from the general public can be directed to the Department of Health hotline:
 - 0861-DOH-CDC (0861-364-232)
- Additional information on RVF is available on the following website references:
 - World Health Organization. Rift Valley Fever. www.who.int/mediacentre/factsheets/fs207/en/.
 - Centers for Disease Control. www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/rvf.htm