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Guidelines for Management, Prevention and Control of Crimean-Congo Hemorrhagic Fever (CCHF)

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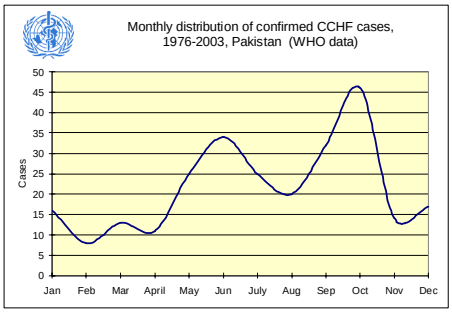
Crimean Congo Haemorrhagic Fever (CCHF) is a viral haemorrhagic fever caused by the Nairovirus of the Bunyaviridae family, transmitted to humans by the bite of the Hyalomma tick or by direct contact with blood of an infected animal or human. CCHF is a severe disease with a high case fatality rate ranging from 2% to 50%. The disease was first described in Crimea in 1944 and identified in 1956 in Congo and thus developed the current name for the disease and its causative virus.[1]

Geographical distribution and trend of CCHF in Pakistan

CCHF was first reported in Pakistan in 1976 but the number of cases has shown a dramatic rise since 2000 with 50-60 cases being reported annually. While Balochistan and NWFP provinces are the most affected areas, one case has been reported from Azad Jammu and Kashmir in 2003, and in 2004 one case has been reported from Attock District of Punjab Province. In Pakistan, the incidence of CCHF peaks in June and October but cases occur throughout the year (Graph-1).[2]



Graph-1 Seasonal occurrence of CCHF in Pakistan.

Reservoirs, hosts, transmission, and incubation:

Reservoir hosts are believed to be hares, birds and Hyalomma ticks. Domestic animals (sheep, goats and cattle) act as amplifying hosts. In Pakistan, CCHF is transmitted from the adult tick (Hyalomma genus), direct contact with the blood / tissue of infected domestic animals (e.g. butchering), or direct contact with the blood / tissue of infected people (e.g. nosocomial). Population migration with animals contributes to the higher probability of susceptible animals being bitten by infected ticks, thus increasing the risk of transmission to humans who handle the animals.[3]

The incubation period after tick bite is usually 1 to 3 days, with a maximum of 9 days. The incubation period following contact with infected blood or tissues is usually 5 to 6 days, with a documented maximum of 13 days. [4]

Case definition

Suspected Case

Patient with sudden onset of illness with high-grade fever over 38.5°C for more than 72 hrs and less than 10 days, especially in CCHF endemic area and among those in contact with sheep or other livestock (shepherds, butchers, and animal handlers). Note that fever is usually associated with headache and muscle pains and does not respond to antibiotic or anti-malarial treatment.

Probable case

Suspected case with acute history of febrile illness 10 days or less, **AND**

- Thrombocytopenia less than 50,000/mm^3 **AND** any two of the following:
- Petechial or purpuric rash, Epistaxis, Haematemesis, Haemoptysis, Blood in stools, Ecchymosis, Gum bleeding, Other haemorrhagic symptom **AND**
- No known predisposing host factors for haemorrhagic manifestations[5]

Confirmed case

Probable case with positive diagnosis of CCHF in blood sample, performed in specially equipped high bio-safety level laboratories, i.e.

- Confirmation of presence of IgG or IgM antibodies in serum by ELISA
- Detection of viral nucleic acid in specimen by PCR
- Isolation of virus

Management of the case and biological materials

A suspected case of CCHF should be managed by diagnosing and treating for other likely causes of fever. If there is no response to anti-malarial and antibiotic treatment, the patient‘s platelet count should be checked and examined in view of the criteria mentioned above for “probable CCHF”. All specimens of blood or tissues taken for diagnostic purposes should be collected and handled using universal safety precautions. [6]

If the case meets the criteria for probable CCHF, begin isolation precautions, alert health facility staff, report the case immediately, draw blood samples for CCHF diagnostic confirmation, and start treatment protocol below without waiting for confirmation. Patients with probable or confirmed CCHF should be isolated and cared for using barrier-nursing techniques – masks, goggles, gloves, gowns and proper removal and disposal of contaminated articles. Please see Box-3. Specimens of blood or tissues of probable CCHF cases should be tested only in high-level bio-safety laboratory.

Treatment Protocol

General supportive therapy is the mainstay of patient management in CCHF. Intensive monitoring to guide volume and blood component replacement is recommended. [3,7,8]

If the patient meets the case definition for probable CCHF, ribavirin treatment protocol (Box-1) needs to be initiated immediately with the consent of the patient/ relatives and the attending physician. [3,9,10,]

Note: Ribavirin is not specific treatment for CCHF viral infection but it has been documented that it can help in the treatment of CCHF infection and it should be started in consultation with physician. Please note that pregnancy should be absolutely prevented (whether female or male partner) within six months of completing a course of ribavirin.

Prophylaxis Protocol

In case of known direct contact with the blood or secretions of a probable or confirmed case such as needle stick injury or contact with mucous membranes such as eye or mouth, the recommended procedure is to do baseline blood studies and start the person on the ribavirin protocol in Box 1 with consultation of physician. [4]

Box-1. Treatment Protocol for CCHF disease

High-dose **oral Ribavirin** therapy constitutes the following:

- 2 gm loading dose
- 4 gm/day in 4 divided doses (6 hourly) for 4 days.
- 2 gm/day in 4 divided doses for 6 days.

Household or other contacts of the case who may have had the same exposure to infected ticks or animals, or who recall indirect contact with case body fluids should be monitored for 14 days from the date of last contact with the patient or other source of infection by taking the temperature twice daily. If the patient develops a temperature of 38.5° C or greater, headache and muscle pains, he/she would be considered a probable case and should be admitted to hospital and started on ribavirin treatment as mentioned in Box-1. [4]

Prevention and Control: Public[1,5,6]

1) Educate public about the mode of transmission through tick bites, handling ticks, and handling and butchering animals, and the means for personal protection.
2) Tick control with acaricide (chemicals intended to kill ticks) is a realistic option for well-managed livestock production facilities. Animal dipping in an insecticide solution is recommended.
3) Public should avoid tick-infested areas when feasible especially when ticks are active (spring to fall). To minimize exposure, wear light clothing that covers legs and arms, tuck pants into socks, regularly examine clothing and skin for ticks, and apply tick repellent such as diethyltoluamide (Deet®, Autan®) to the skin or permethrin (a repellent and contact acaricide) to pant legs and sleeves.
4) Persons who work with livestock or other animals in the endemic areas should take practical measures to protect themselves. They include the use of repellents on the skin (e.g. DEET) and clothing (e.g. permethrin).
5) Butchers should wear gloves and other protective clothing to prevent skin contact with infected tissues or blood.
6) In case of death of CCHF patient, family should be informed to follow safe burial practices (Box-2).

BOX-2 Safe Burial practices[6]

- Thick and long rubber gloves or double pair of surgical gloves should be used for washing the body for burial.
- The dead body should be sprayed with 1:10 liquid bleach solution and then placed in a plastic bag which should be sealed with adhesive tape.
- It should then be wrapped in the winding sheet (kafan) for burial.
- Disinfect the transport vehicle by spraying 1:10 liquid bleach solution on any surfaces touching the body and burn all clothing of the deceased.

Prevention and Control: Hospitals and Health Facilities

1) Hospitals should maintain stock of Ribavirin; in Pakistan it is available in the market as Ribazole®.
2) Bio-safety is the key to avoiding nosocomial infection. Patients with suspected or confirmed CCHF should be *isolated* and cared for using barrier-nursing techniques to prevent nosocomial spread of infection. (Box-3).

Box-3. Bio-safety measures[6]

1) The patient should be treated in a separate room under strict barrier nursing.
2) Only designated medical / para-medical staff and attendants should attend the patient. Non-essential staff and attendants should not be allowed to enter the room.
3) All secretions of the patient and hospital clothing in use of the patient should be treated as infectious and should be autoclaved before incinerating.
4) All medical and para-medical staff and attendants should wear disposable gloves, disposable masks and gowns (gowns should be autoclaved before sending to the laundry or incineration). Use of disposable items should be ensured by supervisor.
5) Every effort should be made to avoid spills, pricks, injury and accidents during the management of patients. Needles should not be re-capped but discarded in proper safety disposal box.
6) All used material e.g. syringes, gloves, canulla, tubing etc, should be collected in autoclave-able bag and autoclaved before incinerating.
7) All instruments should be de-contaminated and autoclaved before re-use.
8) All surfaces should be decontaminated with liquid bleach.
9) The samples for laboratory testing should be properly collected, labelled, sealed, and decontaminated from outside with liquid bleach and packed in triple container packing.
10) The designated laboratory should be informed about the sample and it should be transported to the designated laboratory with great caution, ensuring there would be no breakage or spills.
11) After the patient is discharged, room surfaces should be wiped down with liquid bleach to kill the virus and the room should be fumigated.
12) Please see other instructions for contacts of a CCHF case, below.

Instructions for Monitoring and Laboratory Testing for Contacts of CCHF Cases[4]

1. Definition of "contact"	a. People who were exposed to the same animal(s) as the patient. b. Members of the patient's family or others who were exposed to the sick patient. c. Health workers who were exposed to the sick patient, i.e. while physically examining or treating the patient. d. Health workers who experienced accidental needle stick injury or other accident where blood or secretions of patient were in direct contact with open wound or mucous membrane.
2. Monitoring contacts	a. All contacts, except #d. above, should simply be monitored for 14 days (maximum) from the day of last contact with the patient or other source of infection ***by taking temperature twice daily.*** They should have baseline blood tests and start ribavirin ***only if*** they become genuinely sick, i.e. i. Temperature equal to or more than 38.5ºC ii. Severe headache iii. Myalgia (muscle pains) b. Contacts who have had clear cut exposure, see #d. above, should have baseline blood tests directly after the accident and then be placed on prophylactic oral ribavirin. c. CAUTION: A knowledgeable physician should be consulted about starting ribavirin and monitoring the patient during treatment, and the patient should be advised about the potential side effects of treatment and the necessity of absolutely preventing pregnancy (whether female or male partner) within six months of completing a course of ribavirin.
3. Testing blood for CCHF	a. There is no point in testing the blood for CCHF confirmation during the first 14 days after contact unless they are genuinely sick. b. Obtain blood tests to confirm CCHF ***only when*** contact gets definitely sick during the monitoring period (14 days), i. Increased body temperature equal to or >38.5°C, ii. Headache and myalgia. c. After the 14-day observation period, one may consider testing the blood of a contact for research purposes, to confirm whether they did or did not undergo sub-clinical infection

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