Indian J Med Res 138, December 2013, pp 1027-1028

Correspondence

Re-occurrence of Crimean-Congo haemorrhagic fever in Ahmedabad, Gujarat, India (2012): a fatal case report

Sir,

Crimean-Congo haemorrhagic fever (CCHF) is a tick-borne disease caused by a member of the genus *Nairovirus* of the family *Bunyaviridae*. Infection is transmitted to humans by *Hyalomma* ticks or by direct contact with the blood or tissues of infected humans or viraemic livestock[1]. Clinicopathological features usually include fever, body ache, general weakness, anorexia and rapid progression to thrombocytopenia characterized by haemorrhage and hypovolemic shock and death. Mortality rates reported vary from 10 to 80 per cent[1]. This virus has a wide geographic distribution, circulating in Africa, the Middle East, Asia, and Central and South-Eastern Europe[2]. The disease was first clinically described in 1944 in Crimea in the former Soviet Union during a large outbreak of over 200 cases and the virus was identified in 1967 from a patient in Uzbekistan, and was found to be similar to a virus isolated in 1956 in Congo[3].

Based on the serosurvey data, the presence of CCHF was suspected long back in Jammu and Kashmir in India; similarly CCHF reactive antibodies were detected in southern India[4,5]. The presence of this virus (CCHFV) was confirmed for the first time during investigation of a nosocomial outbreak in Ahmadabad, Gujarat State, India in 2011[6,7]. This CCHF outbreak resulted in four deaths in 2011. The National Institute of Virology (NIV), Pune, found evidence of this virus causing viral haemorrhagic fever cases in humans during 2010 in Rajkot, Gujarat, India[6,7]. The diagnosis of these cases was performed by real-time reverse transcriptase (RT)-PCR or IgM and/or IgG positivity by enzyme linked immunosorbent assay (ELISA). A serosurvey in domestic animals before and after the outbreak revealed the presence of CCHFV specific IgG antibodies and viral RNA[7]. This virus was also isolated from *Hyalomma anatolicum anatolicum* ticks from the Kolat village, Sanand Taluka, Ahmadabad, Gujarat, of index case. State government had taken initiatives to track the cases and reduce the tick population. After the nosocomial outbreak in January 2011, again one more suspected human case was confirmed positive for CCHFV by qRT-PCR and RT-PCR in May 2011. This case had similar clinical presentation as described earlier[7].

Here we report a fatal case of CCHF from Ahmadabad, Gujarat on June 21, 2012. A physician, 29 year old male was admitted on June 20, 2012 in Vadilal Sarabhai Hospital, Ahmadabad, Gujarat with complaints of fever, headache, anorexia, general weakness, metallic taste in mouth since last two days. The patient had no symptom suggestive of allergic condition, diabetes, but had past history of hepatitis E virus infection about one and half year ago. Personal history revealed that he was vegetarian, having no addiction of smoking, alcohol, drugs and tobacco consumption. Exposure history also revealed that he had an accidental contact (splash of infected blood in his eyes) with the index patient. This physician had treated the index case, resident of Kochariya village of Bawla Taluka, Ahmadabad, Gujarat, who had similar symptom of haemorrhagic fever and died a week earlier. Cardiovascular system examination was normal, patient was conscious, oriented, no musculoskeletal deformities were observed. Haemorrhagic manifestations included black coloured loose stool. Decrease in platelet counts (32,000 /µl), increased levels of prothrombin time, activated partial thromboplastin time (17.5 & 31.7 sec), and ferritin up to 2928.9 ng/ml indicated severe malfunction of blood coagulating factors. The increased levels of aspartate transaminase (SGOT, 154.8 U/l), alanine transaminase (SGPT, 132.7 U/l) and lactate dehydrogenase (1152.3 U/l) suggested liver dysfunction. Clinicopathological findings were suggestive of viral haemorrhagic fever;

hence, the clinical sample was sent to NIV, Pune, for investigation, especially for CCHFV testing.

Supportive therapy given to the patient during the course of the disease consisted of hydration, antibiotics and control of temperature. Blood transfusions, two plasma and four platelets solutions were transfused. Despite the treatment, the clinical features deteriorated and the patient died on June 22 due to haemorrhagic shock and vital organ failure.

After the death of the index case, a few tick pools, and blood and serum samples of livestock were collected from the house of index case by the Animal Husbandry Department, Gujarat and sent to NIV, Pune, for investigation for CCHFV. After this case, to ascertain whether CCHFV infections had occurred in contacts (hospital staff), an additional suspected six blood samples were received for the testing of viral haemorrhagic fever.

The clinical samples (serum and plasma) of medical professional (human case-A), tick pool (n=1) and animal samples (n=14) and suspected contact human samples (n=6) were screened by real-time RT-PCR and nested RT-PCR specific to CCHFV based on nucleocapsid gene[8,9]. Real-time RT-PCR data showed presence of high titre virus [threshold cycle (Ct)=18] in case-A and also RT-PCR positivity. Of the 14 animal samples (8 calf and 6 adult cow), only one calf sample was found positive for CCHFV in real-time RT-PCR (Ct= 36) and also in nested RT-PCR. Tick pool (n=1) was also found to be negative by RT-PCR. The suspected six human samples were found to be negative for CCHFV by real time RT-PCR.

After confirmation of short fragment as CCHFV, complete S gene was amplified and sequenced from clinical specimen of case A by a single step RT-PCR (NIV unpublished data). Blast analysis showed homology of 99.0 and 98.0 per cent with Tajikistan sequences AY049083 and AY297691. This sequence showed 99.8 per cent homology with Indian CCHFV sequences from outbreak of 2011[7]. The S segment sequence of case-A was analyzed with earlier CCHF outbreak sequence from India, it showed that this sequence clustered in Indian group as reported earlier in Asian/Middle East genetic lineage IV[7].

Phylogenetic studies confirmed that the same viral strain was circulating in Gujarat State, India, and was responsible for causing deadly disease during 2010-2012. This sends an alert to the public health department of the State for careful monitoring of suspected haemorrhagic fever cases for an early detection of CCHF and ticks control in this area to deal with re-occurrence of CCHF cases.

Acknowledgment

Authors thank the Health Department, Government of Gujarat, authorities of Sterling Hospital Ahmadabad, and Animal Husbandry department, Ahmadabad, Gujarat. Authors also thank Shriyut Piyush Gadekar, Prasad Kokate and Ms Divya Zawar, member of diagnostic team of Virus Repository and High Containment Laboratory, NIV, Pune for technical help.

Pragya D. Yadav, Chandrashekhar G. Raut & Devendra T. Mourya*
Virus Repository & High Containment Laboratory, Microbial Containment Complex, National Institute of Virology (ICMR), 130/1 Sus Road Pashan, Pune 411 021, India
**For correspondence*:
mouryadt@icmr.org.in
dtmourya@gmail.com

References

1. Ergonul O. Crimean-Congo haemorrhagic fever. *Lancet Infect Dis* 2006; *6* : 203-14.
2. Hoogstraal H. The epidemiology of tick-borne Crimean-Congo haemorrhagic fever in Asia, Europe and Africa. *J Med Entomol* 1979; *15* : 307-417.
3. Whitehouse CA. Crimean-Congo hemorrhagic fever. *Antiviral Res* 2004; *64* : 145-60.
4. Rodrigues FM, Padbidri VS, Ghalsasi GR, Gupta NP, Mandke VB, Pinto BD, *et al*. Prevalence of Crimean haemorrhagic-Congo virus in Jammu and Kashmir State. *Indian J Med Res* 1986; *84* : 134-8.
5. Shanmugam J, Smirnova SE, Chumakov MP. Presence of antibodies to arboviruses of the Crimean haemorrhagic fever Congo (CHF-Congo) group in human being and domestic animals in India. *Indian J Med Res* 1976; *64* : 1403-13.
6. Mishra AC, Mehta M, Mourya DT, Gandhi S. Crimean-Congo haemorrhagic fever in India. *Lancet* 2011; *378* : 372.
7. Mourya DT, Yadav PD, Shete AM, Gurav YK, Raut CG, Jadi RS, *et al*. Detection, isolation and confirmation of Crimean-Congo hemorrhagic fever virus in human, ticks and animals in Ahmadabad, India,. *PLoS Negl Trop Dis* 2012; *6* : e1653.
8. Drosten C, Gottig S, Schilling S, Asper M, Panning M. Rapid detection and quantification of RNA of Ebola and Marburg viruses, Lassa virus, Crimean-Congo hemorrhagic fever virus, Rift Valley fever virus, dengue virus, and yellow fever virus by real-time reverse transcription-PCR. *J Clin Microbiol* 2002; *40* : 2323-30.
9. Drosten C, Kummerer BM, Schmitz H, Gunther S. Molecular diagnostics for viral hemorrhagic fevers. *Antiviral Res* 2003; *57* : 61-87.