The largest reported outbreak of CCHF in hospital settings: lessons from Kandahar, Afghanistan

Published Online July 28, 2023 https://doi.org/10.1016/S1473-3099(23)00478-4

Crimean–Congo haemorrhagic fever is an emerging infectious disease that is one of the viral haemorrhagic fevers. The case fatality rate can range from 10% to 40%.[1] Such a disease poses a substantial challenge to public health, particularly in low-income and middle-income countries, where poverty is prevalent and close contact between humans and animals is common.[2] Prevention and control of infection with the Crimean–Congo haemorrhagic fever virus is achieved by avoiding and minimising exposure to infected ticks and avoiding direct contact with infected biomaterial and close contact with infected animals and patients. Many cases occur among people involved in the livestock industry. Hospital-acquired infections can also occur due to improper infection prevention and control, and insufficient clinical knowledge and absence of differential diagnosis to suspect and diagnose Crimean–Congo haemorrhagic fever. Consequently, health-care workers are at high risk of becoming infected.

In Afghanistan, Crimean–Congo haemorrhagic fever is one of the priority endemic zoonotic diseases. In 2022, 26 of 34 provinces in Afghanistan reported cases of Crimean–Congo haemorrhagic fever.[3] With more than 21 million livestock that can host the vector in 34 provinces in a country of 40 million population, the endemicity of Crimean–Congo haemorrhagic fever is understandable.[4]

On April 20, 2023, a person with suspected Crimean–Congo haemorrhagic fever was admitted to a private hospital in Kandahar, Afghanistan. One week later, on April 27, 2023, an additional 48 cases were suspected from the same hospital, with 14 of these cases confirmed by laboratory testing as Crimean–Congo haemorrhagic fever. The confirmed cases included 13 hospital staff members (eight nurses, two medical doctors, a laboratory technician, a hospital administrative staff, and a cleaner) and one hospitalised patient. All cases were recorded within 4 days of the positive diagnosis of the first case, from April 26 to April 29. Laboratory tests used ELISA (VectorCrimean CHF-IgM kit; Vector Best, Novosibirsk, Russia) and RT-PCR (Real Star CCHFV-RT-PCR kit; Altona Diagnostics, Hamburg Germany) kits and 15 cases, including the index case, were confirmed as Crimean–Congo haemorrhagic fever. The turnaround time for laboratory results was approximately 2 days. All suspected cases were observed for 14 days.

All individuals with confirmed cases presented various symptoms, including fever, haemorrhage, fatigue, vomiting, abdominal pain, myalgia, epistaxis, ecchymosis, and nausea. People with suspected cases presented with various general manifestations but no haemorrhage.

The index case, a housewife aged 40 years with a history of animal

	Suspected cases (n=49)	Confirmed cases (n=15)	Health-care worker (n=39)	Non-health-care worker (n=10)
Characteristics				
Age, years				
<20	2 (4%)	0	0	2 (20%)
20–30	38 (78%)	10 (67%)	33 (86%)	5 (50%)
31–40	6 (12%)	3 (20%)	5 (13%)	1 (10%)
≥41	3 (6%)	2 (13%)	1 (3%)	2 (20%)
Mean (SD)	27·1 (9·0)	28·7 (9·0)	25·7 (7·5)	32·4 (9·0)
Sex				
Male	30 (61%)	11 (73%)	28 (72%)	8 (80%)
Female	19 (39%)	4 (27%)	11 (28%)	2 (20%)
Occupation				
Health-care worker	39 (80%)	13 (87%)	..	..
Doctor	6 (12%)	2 (13%)	6 (15%)	..
Nurse	24 (49%)	8 (53%)	24 (62%)	..
Laboratory technician	1 (2%)	1 (7%)	1 (3%)	..
Administration	3 (6%)	1 (7%)	3 (8%)	..
Cleaner	5 (10%)	1 (7%)	5 (13%)	..
Housewife	8 (16%)	1 (7%)	..	8 (80%)
No job	1 (2%)	1 (7%)	..	1 (10%)
Farmer	1 (2%)	0	..	1 (10%)
Signs and symptoms*				
Fever	38 (78%)	15 (100%)	28 (72%)	10 (100%)
Extreme fatigue	21 (43%)	13 (87%)	18 (46%)	3 (30%)
Vomiting	24 (49%)	13 (87%)	14 (36%)	10 (100%)
Malaise	18 (37%)	12 (80%)	17 (44%)	1 (10%)
Headache	29 (59%)	14 (93%)	19 (49%)	10 (100%)
Petechia	8 (16%)	6 (40%)	7 (18%)	1 (10%)
Outcome				
Recovery	48 (98%)	14 (93%)	39 (100%)	9 (90%)
Death	1 (2%)	1 (7%)	0	1 (10%)

Data are n (%), unless otherwise specified. *Not mutually exclusive.

Table: **Descriptive statistics of the people involved in the Crimean–Congo haemorrhagic fever outbreak in Kandahar, Afghanistan**

contact, was the only reported death due to this outbreak, resulting in a case fatality rate of 2%. Mean age for all suspected cases was 27 (SD 9) years and for confirmed positive cases 28 (SD 9) years (table). 61% of all suspected cases were males. 73% of confirmed cases were males.

WHO Afghanistan, in close collaboration with national and local health authorities, immediately launched a multidisciplinary response to the outbreak that included an investigation team deployed to the hospital; notifying the International Health Regulations focal point and the regional WHO office (Eastern Mediterranean Regional Office); detailed interviews with patients, hospital authorities, and provincial health authorities; providing resources for contact tracing, drugs (ribavirin), and PPE; enhancing laboratory capacity through training and delivery of laboratory supplies; and disseminating public awareness messages to the public and community leaders.

This nosocomial outbreak presented a classic epidemiological triangle: infection from a tick-harbouring animal to the first person, this index case resulted in infections in some health-care workers due to little awareness and few infection prevention and control measures, and from health workers to a hospitalised patient and other health facility support staff. Similar nosocomial Crimean–Congo haemorrhagic fever outbreaks were reported in various countries, and especially in the eastern Mediterranean region.[2]

Findings and observations from Afghanistan show that transmission due to direct unprotected contact with infected blood, tissue, and secretion is quite common.[3] In our case, in the hospital setting, we faced human-to-human transmission and all confirmed cases were symptomatic. Our findings revealed that infection prevention and control was compromised during patient examination, laboratory testing, and cleaning after the index case and subsequently. Similar findings were reported by Pshenichnaya and Nenadskaya,[5] Tsergouli and colleagues,[6] and Yadav and colleagues[7] but with a much lower number of cases than in this situation. Having such a large number of infected health-care workers was related to severe discrepancies in implementation of standard infection prevention and control protocol found during our visits: personal-protective equipment (including goggles, gowns, and respirators) were not used or used nominally. Similarly, clothes, contaminated objects, and biological liquids of patients were not handled properly. Furthermore, the patient's isolation was not strictly enforced and visiting was unrestricted.

Notably, from one index case, we got 48 suspected cases among which 14 were confirmed, all in one hospital setting. Existing data[2,6] indicate that percutaneous exposure or contact with infected body fluids were the primary routes of nosocomial transmission in this outbreak of Crimean–Congo haemorrhagic fever. Therefore, during the nosocomial infections, different transmission methods were used simultaneously and played an important role, and should not be neglected.

Despite Crimean–Congo haemorrhagic fever being one of the most widespread tick-borne diseases in Afghanistan, the true burden of the disease is still not fully known. Although Crimean–Congo haemorrhagic fever is a notifiable disease, many field-level physicians apparently have difficulties in recognising, differentially diagnosing, and treating this infection. Anecdotal evidence from the field indicated that many cases present without evident haemorrhagic manifestations and patients do not receive the proper medical care.

Our findings show that case numbers of Crimean–Congo haemorrhagic fever will increase drastically in health-care settings if infection prevention and control measures are not respected. It is imperative to adhere to the WHO One Health integrated approach, to sustainably balance and optimise the health of people, animals, and ecosystems. Designing and implementing programmes, policies, legislations, and research in which multiple sectors work together to achieve better health outcomes is mandatory; this is crucial to addressing health threats in the animal–human–environment interface.[8]

We declare no competing interests.

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