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Knowledge, attitude and practice of healthcare workers concerning Crimean-Congo hemorrhagic fever in Western Iran

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ABSTRACT

Objective: To determine the knowledge, attitude and practice of healthcare workers in Kermanshah Province about Crimean-Congo hemorrhagic fever (CCHF).**Methods:** This study was conducted in 2014 on healthcare personnel in different job categories including physicians, nurses, midwives, laboratory staff and network health staff of Kermanshah Province by direct interview.**Results:** A total of 367 respondents who had more than 5 years of experience in their jobs were interviewed. Among them 91% of physicians and nurses, 97% of midwives and health workers and 96% of laboratory staff stated that they had not been confronted with CCHF patients so far. Regarding knowledge, 76% of physicians, 78% of nurses, 77% of midwives and 58% of laboratory staff believed that the disease is remediable. Most of the interviewed participants stated that the disease pertains to people who are in close contact with domestic animals, but they did not consider their own occupations as one of the risk factors. More than 70% of the respondents believed that the disease may exist in the province or their work field. Generally, the knowledge about CCHF was inadequate, with nurses having the lowest level of knowledge.**Conclusions:** Knowledge of Kermanshah healthcare staff about CCHF was poor, especially nurses in a high risk job category. Therefore, it is necessary to conduct specific training programs for the disease identification, transmission, prevention, and treatment as well as the use of personal protection and safety devices.

1. Introduction

Crimean-Congo hemorrhagic fever (CCHF) is an acute hemorrhagic fever caused by segmented, negative-stranded RNA virus belonging to the family Bunyaviridae, genus *Nairovirus*, which is the second most widespread of all medically important arboviruses, after dengue virus. Basically, this disease is transmitted to humans by domestic animals and bite of an infected tick or via aerosol generated from infected animals' excreta. Human to human transmission occurs following contact with an infected person's blood, tissue or fluid discharge. The vectors of this arthropod-borne disease are generally hard ticks of Ixodidae family,

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The study protocol was approved by the Ethic Committee of Kermanshah University of Medical Sciences which approved the investigations. Informed written consent was obtained from all participants in this study. Confidentiality on the content of the records was kept by the investigators and information was only utilized for the research purpose.

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including some species of *Rhipicephalus*, *Boophilus*, *Dermacentor* and *Hyalomma* (in particular *Hyalomma marginatum*). Some species of *Argas* and *Ornithodoros* in Argasidae family have been reported to be infected [1–5]. The virus of the disease can be transmitted via transovarial transmission through the eggs of tick vectors to their next generation and can pass through different stages of their life cycle. Therefore, if a tick bites an infected vertebrate, it will be infected in all its life and can transmit the disease to humans by bites.

Climate has also been found as important predictor of CCHF risk; areas regularly experiencing long period of low rainfall and humidity were associated with increased incidence of CCHF in Iran and Senegal, and higher temperatures were indicators of CCHF occurrence in Turkey, Bulgaria, and Iran [6,7]. Outbreak of the disease occurs in warm seasons when ticks are more active and questing hosts for blood feeding. Most cases were reported between April and September. Increasing mean temperature, normalized difference vegetation index, savannah-type land coverage or habitat fragmentation increased significantly the incidence of CCHF in the CCHF-affected areas [7]. Climate, environmental factors and human behavior that may influence CCHF epidemiology and spread should be further studied. Facilitated tick reproduction and global warming which are mainly attributed to climatic changes should be considered in the potential changing epidemiology of CCHF [8].

Hosts of the disease include a range of domestic and wild animals such as cattle, sheep and goat. The birds are resistant to infection but ostrich is sensitive. In endemic areas where human infection is the source, the disease is of high prevalence. There are no clinical symptoms in animals, and this increases the risk of infection in humans when slaughter the infected animal or contact animal's skin or carrion shortly after slaughtering. CCHF has been ranked as one of the most important nosocomial infections and hospitalized patients could infect others, for which reason they must be isolated. CCHF virus is on the US list of select agent considered to have bioterrorism potential because of its association with rapid-onset of hemorrhagic fever and 30% case fatality rate [5,8–10]. There is considerable difference among mortality rates of the disease in different parts of the world. The difference is not only related to that of diagnostic services-medical care, but also to virulence and pathogenicity of different virus strains across the world. For example, the disease is milder in South Russia with a mortality rate of 5%–10%, but in South Africa and Middle East the mortality rates were reported as 35% and 35%–50%, respectively. It should be noted that the mortality was higher in hospital epidemics [11]. The World Health Organization has listed CCHF among the emerging diseases for which control and prevention measures should be renewed and intensified. According to our consensus measure, the five countries currently having the strongest evidence for presence of CCHF are Turkey, Iran, Afghanistan, Tajikistan, and Pakistan [12,13].

The disease has been reported in several countries from Africa (Senegal, Nigeria, South Africa, Kenya, Tanzania, Ethiopia, Mauritania, Congo, and Uganda), Europe (Bulgaria, Turkey, Albania, Kosovo, Greece, Yugoslavia, Hungary, Russia and Ukraine) and Asia (Iraq, Pakistan, India, Afghanistan, Oman, Iran, China and United Arab Emirates) [13,14], and imported CCHF has never been reported in Northern Europe or in America [15]. CCHF in Iran was first reported in 1970, when virus antibodies were identified in the sera of 45 sheep sent from Tehran to Moscow [16]. After that antibodies of the virus were detected in 13% of people who were living in Caspian Sea littoral from East

Azerbaijan Province [17]. Mortality rate approaching 20% in 2 000 remarkably dropped to 6% in 2007. CCHF, however, is an emerging disease in the country. The disease exists in almost all parts of Iran according to the epidemiological evidences and confirmed cases [18]. In recent decades, confirmed human cases that resulted in death were reported in provinces of Sistan-va-Baluchestan, Khuzestan, Chaharmahal-va-Bakhtiari, Azerbaijan-e-Gharbi, Bushehr, Yazd, Kerman, Tehran, Esfahan, Golestan, Fars, Qom and Khorasan in Iran [6,14,18].

CCHF is an occupational disease for butchers, slaughter house workers, livestock workers, animal husbandry workers, veterinarians and healthcare workers who belong to the group of people at high risk of the disease in the endemic areas of CCHF [12]. In a survey conducted in south of Iran, livestock was identified as the source of infection and CCHF outbreak occurred via two routes: contact with tissue and blood of infected livestock, as well as nosocomial transmission [16]. Hence, the knowledge of people who are in contact with the disease should be evaluated periodically.

Kermanshah Province is important from CCHF point of view because of cattle trafficking with infected areas, illegal slaughtering in the area and confirmed cases of disease and death in the neighboring provinces [11,12,19]. Therefore, it is necessary to evaluate the knowledge of at-risk occupational groups. The aim of this study was to evaluate the knowledge, attitude and practice of the healthcare staff as one of the high risk occupational groups of people towards CCHF.

2. Materials and methods

Kermanshah Province, located at the extreme west of Iran shares border with Iraq, and is located at the coordinates of 33.36–35.15° N and 45.24–48.30° E (Figure 1). The weather is moderate and both cold and warm regions can be found in the province. Annual mean temperature is reported as 15.4 °C and the mean annual rainfall is recorded between 300 and 800 mm. The capital city is Kermanshah and 13 other cities are located in this province. There are many livestock farms in this province and CCHF virus has been detected from ticks and patients in recent years.



Figure 1. Map of Iran and location of Kermanshah Province in Western Iran.

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