The Outcome of Patients with Crimean-Congo Hemorrhagic Fever in Zahedan, Southeast of Iran: A Comparative Study

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Background: Crimean-Congo hemorrhagic fever was rarely reported from Iran before 1999. In a recent outbreak, the disease has been reported from different provinces of Iran, especially from Sistan and Baluchestan. Ribavirin has been recommended by World Health Organization as a potential therapeutic modality for Crimean-Congo hemorrhagic fever. This study was conducted to determine the clinical outcome and the effect of ribavirin in two groups of patients with Crimean-Congo hemorrhagic fever who were treated at different times.

Methods: In this cross-sectional study, we evaluated patients with Crimean-Congo hemorrhagic fever who were admitted to Boo-Ali Hospital in Zahedan, a subtropical area in southeastern Iran, at the first three years after beginning of the last outbreak (1999 – 2003) and those who were admitted during 2005 – 2007. First, we found all patients with confirmed Crimean-Congo hemorrhagic fever infection who were treated with oral ribavirin. Then, they were evaluated for recovery and mortality rate.

Results: We evaluated 123 patients with confirmed Crimean-Congo hemorrhagic fever infection (91 patients treated between 1999 and 2003, and 32 patients between 2005 and 2007). Among the 91 patients, 73 (80%) survived, and 18 (20%) died of the disease. During 2005 – 2007, among the 32 patients who were treated within three days of onset of the disease, only one (3%) died of the disease. The recovery rate was higher among patients who were admitted during 2005 – 2007 than those hospitalized between 1999 and 2003 (97% vs. 80%). There was a significant \(P=0.001\) difference in the mortality rate between the two groups.

Conclusion: Prompt treatment with oral ribavirin can increase the recovery rate in patients with Crimean-Congo hemorrhagic fever.

Keywords: Crimean-Congo hemorrhagic fever • mortality rate • recovery • ribavirin

Introduction

Crimean-Congo hemorrhagic fever (CCHF) is a fatal viral infection. It is distributed throughout the Mediterranean region, Central Asia, Eastern Europe, and Africa.\(^1,2\) It was first observed in the Crimean Peninsula by Russian scientists in 1944;\(^3\) a recent outbreak was reported from Iran.\(^4\) CCHF is a zoonotic arboviral disease, which is transmitted to humans via tick bite or via human or domestic animal (in particular sheep, goats, and cows) blood transmission.\(^1\) It has been said that transmission may also occur through direct or aerosol contact with the blood of patients in advanced stages of the disease.\(^3,4\) After a short incubation period, CCHF is characterized by a sudden onset of high fever, severe headache, dizziness, and myalgia. Additional symptoms can include nausea, vomiting, diarrhea, and somnolence.\(^1,4\) In severe cases, hemorrhagic manifestations, ranging from petechia to large areas of ecchymosis, develop.\(^1,3\) Ribavirin was suggested as an effective drug in recent studies. No adverse event related to ribavirin therapy was noted.\(^1,4,8\) In a recent outbreak in Iran, the mortality rate was reported from 10% to 30%...
The objective of this study was to compare the clinical outcome of patients with CCHF at the beginning of the last outbreak in Iran, when unfortunately ribavirin was not readily available for patients, with that during the last three years when ribavirin was enough in our hospital.

Materials and Methods

This was a cross-sectional study conducted in 2007. The study population included 123 patients with confirmed CCHF (91 patients diagnosed between 1999 and 2003, and 32 patients diagnosed between 2005 and 2007) who were admitted to Boo-Ali Hospital in Zahedan, southeastern Iran. We compared the clinical outcome between these two groups of the patients. The disease was confirmed by Enzyme-Linked ImmunoSorbent Assay (ELISA) and Reverse transcription-polymerase chain reaction (RT-PCR) technique. All patients who were included in this study, were treated with oral ribavirin.

Results

At the beginning of the recent outbreak, from 91 patients who were treated with ribavirin, 73 (80%) survived and 18 (20%) died of the disease. Among the survived patients, 58 (79%) were treated during the initial 72 hr and 15 were treated thereafter. Sixteen patients who were treated after this period, expired. The mortality rate was lower in those who were treated during the initial three days (two vs. 16). During 2005 – 2007, of 32 patients who were treated within three days of the onset of the disease, only one (3%) died of the disease. There was a significant ($P=0.001$) difference in the recovery rate between the two groups who were treated at the beginning of the recent outbreak and during 2005 – 2007.

Discussion

CCHF is a viral hemorrhagic fever of the Nairovirus group. It is widely distributed in wild and domestic animals, such as cattle, goats, sheep, hares, birds, and ticks throughout many regions of Asia, especially the Middle East, Europe, and Africa. Although the first human cases of infectious hemorrhagic fever in Iran were identified in the west of Iran, since 1999, the number of endemic areas have substantially been increased in several provinces of Iran with an increasing morbidity rate and approximately a high fatalities (30%). Between 1999 and 2004, the southeastern part of Iran experienced its largest number of 169 confirmed cases of recorded CCHF patients.

Our study showed that of the 91 patients, the mortality rate was 20%. During 2005 – 2007, out of 32 patients, only one (3%) died of the disease. At the beginning of the recent epidemic in southeastern Iran, we had little information on epidemiology of the disease in this area. Moreover, ribavirin was not readily available for the treatment. However, during the last three years, this drug was enough in our hospital. On the other hand, there was a close collaboration between the academic centers and other state health officials for early recognition of the disease and more importantly, to start oral ribavirin therapy at early stages of the illness. Both of these factors had significant positive effects on survival of the patients. Therefore, while between 1999 and 2004 (in the first study) in Sistan and Baluchistan, we had 165 confirmed patients with a mortality rate of 22%, the rate in the last few years was 3%. Our results showed that oral ribavirin, especially when administered in the early stages of the illness has a significant positive effect on survival of the patients. Chinikar and his colleagues in 2005, showed that 36.31% of suspected patients were IgM positive for CCHF and, 27 (10.89%) of 248 IgM-positive patients subsequently died of CCHF. Alavi-Naini et al., in 2006, showed that 22% of their patients expired. In one report from southeastern Iran in 2006, 21% of CCHF patients who were admitted during a five-year period died of CCHF. In two recent studies, those who died of the disease were referred to hospital late; many of whom received ribavirin after five to seven days of the onset of the illness. Ribavirin is recommended by WHO for treatment of CCHF. The affected patients are usually from rural areas and cannot then afford the money to buy ribavirin. It is therefore suggested that this drug be available in all drugstores and be used as the first line of treatment for patients with CCHF to achieve cure for this important fatal disease.

Conclusion

Prompt treatment with oral ribavirin can increase the recovery rate. Ribavirin should be
given to the all suspected patients with CCHF who have severe thrombocytopenia and a history of travel to the endemic areas.

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References

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