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Using of ELISA in Diagnosis of Crimean-Congo Hemorrhagic Fever Virus, a Case Report

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Abstract This report is a case of Crimean-Congo hemorrhagic fever (CCHF) witch observed in a tourist woman in Istanbul. The patient presented with chills and abdominal pain. For this blood sample has been collected at the onset of the disease and tested for CCHFV antigen by using Enzyme-linked immunosorbent assay (ELISA). In result, antigen positive has been determined and the patient was found to be positive for CCHFV by ELISA.
Keywords CCHFV; ELISA; Istanbul; Case report

Introduction

Crimean Congo haemorrhagic fever virus (CCHFV), is a member of the genus Nairovirus and Bunyaviridae family. Crimean Congo haemorrhagic fever (CCHF) is one of a group of arthropod-borne viral diseases producing acute, sometimes fatal febrile and hemorrhagic symptoms. Initially involving the nervous system, disease may in severe cases progress to vascular disorders such as profuse diapedesis hemorrhages, brain edema, general malaise, and ultimately cardiac arrest (Wilson et al., 1990). The major transmission of the virus is mediated by Hyalomma ticks; it can also be transmitted by squashing ticks, contact with contaminated secretions, blood and sera of patients and viremic animals (Swanepoel et al., 1987; Bosan et al., 2000; Burt et al., 1997; Whitehouse, 2004; Chinikar et al., 2004; Papa et al., 2004). Health workers, relatives of CCHF patients, people working with animals and animal products (shepherds, animal care workers, veterinarians and slaughterhouse workers) and people that had tick bites in CCHF endemic areas are under high risk of being infected by CCHF. Serious endemic CCHF outbreaks have been reported in countries from Europe, Asia and Africa (Whitehouse, 2004; Flick and Whitehouse, 2005; Papa et al., 2004).

1 Case report

The disease started on July 12, 2008, a 22-year-old tourist woman, presented at a local health outlet with high grade fever accompanied with chills, severe headache, dizziness, photophobia, neck pain, myalgia and arthragia.

In the first examination, her vital signs included a high body temperature of 40℃. Two days later, she developed gastrointestinal symptoms including nausea, vomiting, non-bloodily diarrhea and abdominal pain.

2 Results

Regression analysis was performed on the optical density (OD) data of sera, the OD of sample were above 0.40 and considered as a strong positive (++).

3 Discussion

Endemic outbreaks of CCHF have been reported in Turkey between 2002 and 2008 with averages of 5% mortality (Carhan et al., 2008). Seroprevalence of Crimean-Congo hemorrhagic fever (CCHF) in risk groups was carried out in Tokat Province of Turkey (2006-2007). Researchers reported 41 cases of CCHF with one death in July 2005 in Turkey's Yozgat Province, and 50 death cases were reported in Turkey in August 2008 due to CCHF. According to Ministry of Health of Turkey 3 128 Crimean–Congo hemorrhagic fever cases were observed between 2002 and 2008. In Kosovo's Kosovo Polje hospitals reported 70 cases of CCHF with four deaths in May 2010 (Prajapati et al., 2011).

The higher prevalence of CCHF in countries such as

Albania, Bulgaria, the former Yugoslavia, Ukraine, Georgia, Tacikistan, Iran, and Pakistan was reported (Whitehouse, 2004; Chinikar et al., 2004; Papa et al., 2004).

The enzyme-linked immunosorbent assay (ELISA) was a highly sensitive and specific tool for CCHF diagnosis (Garcia et al., 2006).

CCHV is a zoonotic disease that affect people who come into contact with livestock and tick and in endemic areas, animals infection appear to be one of the best indicators of risk to human infection (Kuljic-Kapulica, 2004).

4 Conclusion

We conclude from this report that rapid diagnosis of CCHF is important to prevent the spread of CCHF virus among the health people.

5 Materials and Methods

Peripheral blood sample was collected at the onset of the disease using Vacutainer tubes. Blood sample were centrifuged at 1 500 rpm for 30 min, serum were separated, transferred into 2 mL Eppendorf micro-centrifuge tubes and stored at –20℃ until used for the ELISA.

Detection of CCHFV antigen in serum samples was performed with the use of a commercially kit according to the manufacturer's recommendations. Standardized optical density (OD) values were calculated as follows: standardized OD = (raw OD of sample － raw OD of negative control) / (raw OD of positive control － raw OD of negative control).

Values < 0.22 were considered negative, values > 0.35 positive (+) and values > 0.35 strong positive (++). Samples with OD values from 0.22 to 0.40 were retested with another serum.

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