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Crimean-Congo Hemorrhagic Fever in Iraq During 2010

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Summary

Crimean-Congo hemorrhagic fever (CCHF) is a viral zoonotic disease with a high mortality rate in humans. CCHF is caused by genus *Nairovirus,* in family of *Bunyaviridae,* and is transmitted to humans through the bite of ticks *Hyalomma* spp or contact with blood or tissues of CCHF patients or infected livestock.

The total numbers of positive patients to CCHF virus was 11 out of 44 suspected samples were examined from eight provinces during the period from January to December 2010 . The way of transmission is due to contact with blood and tissues of infected animals, and one patient slaughtered sheep in his house. ELISA was used to detect Crimean-Congo hemorrhagic fever (CCHF) virus-specific immunoglobulin M (IgM) in human serum samples.

حمى القرم - الكونغو النزفية في العراق خلال 2010

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الخلاصة

ان مرض القرم الكونغو النزفية (CCHF) هو مرض فيروسي حيواني المنشأ مع ارتفاع معدل الوفيات لدى البشر. ويتسبب CCHF بواسطة جنس Nairovirus ، في عائلة من الفيروسات البنياوية *Bunyaviridae* ، وينتقل الفيروس إلى البشر عن طريق لدغة القراد أو ملامسة دم أو أنسجة المرضى أو الماشية المصابة. وكان اجمالي عدد المرضى ايجابية لفيروس CCHF 11 عينة من أصل 44 مشتبه اصابتهم بالمرض من ثماني محافظات خلال الفترة من يناير إلى ديسمبر 2010. طريقة انتقال العدوى كانت بسبب الاتصال مع الدم وأنسجة الحيوانات المصابة ، واصابة واحدة نتيجة ذبح خروف من قبله في منزله.استخدم فحص ELISA للكشف عن الاجسام المضادة IgM لمرض فيروس القرم الكونغو النزفية (CCHFV)

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Introduction

CCHF disease is one of the most virulent viral hemorrhagic fevers and it is a life threatening disease reported in many countries in Europe, Asia and Africa(1,2). CCHFV is a member of the *Nairovirus* genus of the family *Bunyaviridae*, Only three members are known to be pathogens of humans, namely, CCHFV, Dugbe and Nairobi sheep disease viruses (3). CCHF was first recognized in the Crimean peninsula in the mid-1940s, when a large outbreak of severe hemorrhagic fever among agricultural workers was identified. However, the virus was first isolated from a patient with a one day fever in Kisangani, Democratic Republic of Congo, in 1956 (4,5,6) .Crimean-Congo hemorrhagic fever (CCHF) virus causes a hemorrhagic and toxic syndrome disease in humans and high mortality rates of up to 50% (7). The geographical distribution of the virus is widespread. The disease is endemic in parts of Africa, Asia, the Middle East and Eastern Europe. In Africa, outbreaks have been reported from South Africa, Congo, Mauritania, Burkina Faso, Tanzania and Senegal. An outbreak in China in 1965 had a case fatality rate of 80%. A large number of cases have also been reported from Middle Eastern countries such as Iraq, United Arab Emirates, Saudi Arabia and Oman(8). Since 2000, outbreaks have been reported in Albania, Kosovo (9), Turkey (10), Pakistan, Iran, Mauritania, Keny (8) and Greece (11).

The occurrence of CCHF closely approximates the known distribution of *Hyalomma* spp. ticks. Humans become infected through the bites of ticks, or possibly by crushing engorged infected ticks, or by contact with blood or tissues from viremic livestock or by direct contact with a patient with CCHF during the acute phase of infection occurs primarily in the hospital (nosocomial infection) and is generally characterized by more severe clinical symptoms and high mortality (12, 13, and 14). Several studies have been done concerning probable risk factors like demographic features and the vocation states. It seems that butchers, veterinarians

and sheepherders are at a special risk due to probable contamination with infected tissues and blood from animals. Medical staff who works in hospitals or laboratories may acquire the infection directly from patients or contaminated human products (15). The aim of this paper is to raise awareness for those working in the field of veterinary medicine and medicine for the importance of this disease in Iraq.

In Iraq the Crimean-Congo hemorrhagic fever was unknown in Iraq till September 1979, when 24 years old lady admitted to AL- yarmok hospital in Baghdad with bleeding tendency at 7.Sep.1979, after 2 days she died. After 4 days the physician and one of the health workers who were in close contact with the patient they developed fever, headache, with bleeding from GI tract. Unfortunately they died too. During that year 10 cases were reported (8 were female and 2 were male). Seven out of ten were died. All the cases were in contact with animal except the physician and the health worker (16). Between Sept. and Nov./1979 , 925 randomly selected persons living in different areas were checked for serological evidence of C.C.H.F. 4.54 % were positive (17) .In experimental infection virus appear in the blood stream in 1 – 5 days of inoculation, three isolates had been recovered from sheep in patients houses and two isolates from adult ticks of *Hyalomma marginatum* in Aziziya district (18). Other study a total of 551 persons and 270 farm animals (93 sheep, 93 cow , 84 goat and 50 rat) were examined for the detection of CCHF-IgG in a focus in Diyala Governorates the prevalence of positive sera was 6.4% in persons and 33.3% in cow and sheep and 28.5 in goat respectively(19,20) .Nosocomial infection in Iraq were reported three times at 1979 (2 cases were died) , 1992 (2 cases) , and 1996 (1case) (17,21). Nosocomial infection has been reported from Turkey (8), South Africa, (22) United Arab Emirates (23), Pakistan (24), and Iran (25). The objective of this paper is to increase awareness of the workers in the field of veterinary medicine and medicine to avoid direct contact with potential infectious materials.

Materials and Methods

The case definition for Suspected cases included individual who had fever, mylgia, malaise, diarrhea, history of tick bites, slaughter of animal, contact with patient in acute case and travel to endemic area.The probable cases included patient who had leukopenia, thrombocytopnenia, elevated of liver enzymes (ALT,AST,), Proteinuria and haematuria. Probable cases with isolation of virus, or Detection of antigen, or Detection of antibody were considered as CCHF confirmed cases.

Acute-phase serum samples from 44 patients from 8 provinces who were suspected with CCHFV infection between January - December 2010. Patients' serum samples were obtained at the time of admission and send to Central public Health laboratory (CCHF.REF.LAB) Baghdad. Diagnosis was confirmed by ELISA for anti-CCHFV IgM as described [CCHF IgM ELISA Kit National Institute for Comm. Dis. Special Pathogens Unit]. The age of suspected patients with CCHF cases was ranged between 5 month and 70 years.

Results

In the period from 1 January to December 2010, 44 suspected cases of CCHF were notified in Iraq. The province reporting most infections was Mosul. Eleven individuals out of 44 were found positive for CCHFV IgM (Figure 1) and (Table 1).

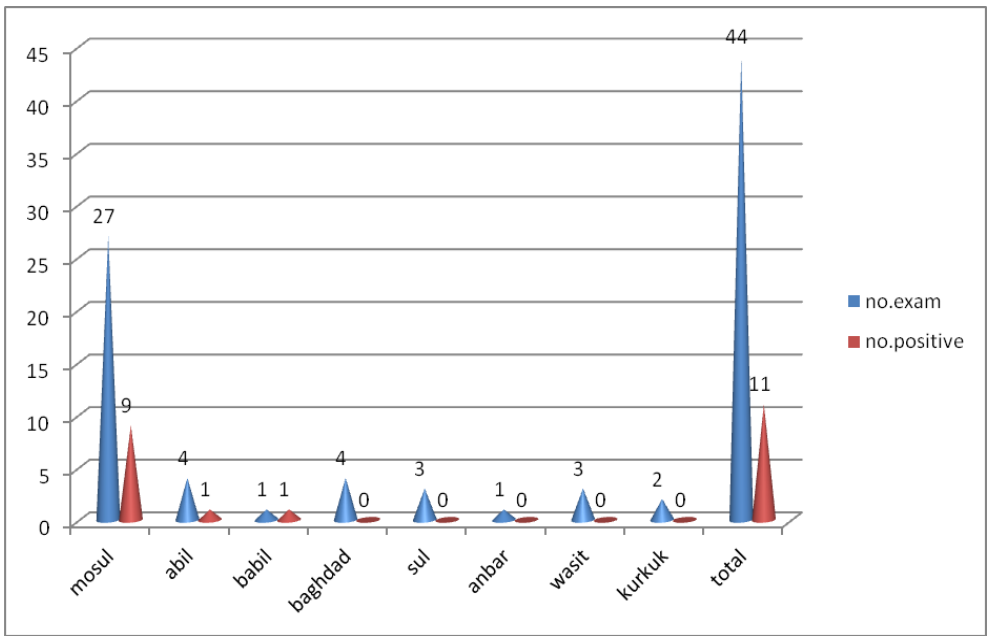

Figure 1: show the suspected and positive cases of CCHF in provinces.

Table 1: The total numbers of positive persons to CCHF virus was 11 out of 44 suspected samples examined by IgM ELISA.

No.	Province	Male		Female		Total Exam.	Total Positive
		No.Exam.	Postive	No.Exam.	Postive		
1	Mosul	13	5	14	4	27	9
2	Kerkuk	2	0	1	0	3	0
3	Erbil	2	1	2	0	4	1
4	Sulimania	2	0	1	0	3	0
5	Babil	1	1	0	0	1	1
6	Kut	2	0	0	0	2	0
7	Baghdad	3	0	0	0	3	0
8	Anbar	1	0	0	0	1	0
Total Exam.		26	7	18	4	44	11

Discussion

The outbreaks start on 9/5/2010 in Mosul province (27 cases) especially in Hai Alkudus (7 out of 9 patients in Mosul). Table 1 demonstrated that the main route transmission of CCHF was through handling blood and tissues of slaughtered viremic livestock at the street (Mousl province), and one patient slaughtered sheep in his house (Babil province). It is clear that when livestock and other hosts are in the viremic period, they are dangerous for transmission of CCHFV to human (26). Eleven out 44 was positive and 4 died, ELISA was used to detect Crimean- Congo hemorrhagic fever IgM antibody in human serum samples. False negative result may occur in died patients due to acute phase (less than five days of infection) and cannot detect IgM antibody in serum (25) and need other test for diagnosis at acute phase like RT-PCR.

Clinical symptoms and patient history, especially traveling to endemic areas and history of tick bites or exposure to blood or tissues of livestock or human patients, are the first indicators of CCHF. The clinical symptoms differs from patient to patient, the most symptoms are fever, bleeding from different parts of body like (gum, nose, bleeding from

needle-puncture sites or gastrointestinal and other haemorrhagic symptom), petechial rash and laboratory tests showed severe thrombocytopenia.

The differential diagnosis should include rickettsiosis (tick-borne typhus and African tick bite fever), leptospirosis, and borreliosis (relapsing fever). Additionally, other infections, which present as hemorrhagic disease such as meningococcal infections, Hantavirus hemorrhagic fever, malaria, yellow fever, dengue, Omsk hemorrhagic fever, and Kyasanur Forest disease should be considered. In Africa, Lassa fever and infection with the filoviruses, Ebola and Marburg, must also be included in the differential diagnosis (12)

There are about 192 confirmed cases of CCHF have been reported from different provinces of Iraq (between 1992 and Dec. 2010); however, five cases of nosocomial infections were recorded in 1979, 1992 and 1996(17, 21). It is of very importance to diagnose suspected cases of CCHF in the early stages as early as possible. Blood samples from suspected CCHF virus cases should be handled carefully, to prevent the transmission of CCHF among medical and laboratory staff.

One of the factors that contributed to the control of this outbreak was the well-coordinated and efficient surveillance system for CCHF that is in place in Iraq. The system is not only responsible for continuous monitoring of this disease but also deals with outbreaks. Rapid and precise laboratory diagnosis of CCHF allowed controlling this outbreak. Nevertheless, a higher level of training and precautionary measures for healthcare workers (such as use of isolation chambers in hospital wards, mask and other medical shields during contact to CCHF patients) and other high risk professions could help to decrease the outbreak rate in the endemic areas.

In conclusion, Iraq as being an endemic country for CCHF in the Middle East beside neighboring countries as Turkey and Iran. Efficient surveillance and control programmes for CCHF in Iraq is needed and could prove beneficial.

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