



The situation of Crimean – Congo Hemorrhagic fever in Albania from 2013-2016

Krasniqi Marsida¹ , Bino Silvia²

1.Catholic University "Our Lady of Good Counsel" Tirana, Albania

2.Institute of Public Health, Tirana, Albania

Corresponding author:

Catholic University "Our Lady of Good Counsel" Tirana, Albania: E-mail: k_marsida@yahoo.it

Publication History

Received: 17 March 2017

Accepted: 15 April 2017

Published: May-June 2017

Citation

Krasniqi Marsida, Bino Silvia. The situation of Crimean – Congo Hemorrhagic fever in Albania from 2013-2016. *Medical Science*, 2017, 21(85), 143-149

Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

General Note

Article is recommended to print as color digital version in recycled paper.

ABSTRACT

Crimean-Congo hemorrhagic fever is a zoonotic viral disease that can be a serious threat to humans. The transmission of the virus is by ticks bite, by direct contact with blood or tissues from infected animals and by humans to humans by infected persons. Clinical signs can vary from asymptomatic to clinical signs as high fever, myalgia, severe malaise, gastrointestinal symptoms, bleeding. CCHFV is endemic in large parts of the world and is regarded as a public health problem in these regions. The aim of this study is to identify the situation of Crimean Congo hemorrhagic fever in Albania and to evaluate the clinical forms of the disease in Albania. This study was conducted at the Institute of Public Health in Tirana in cooperation with the University Hospital Mother Teresa in Tirana and with district hospitals (Kukes, Has, Ersekë, Berat) where cases with CCHF were found. Confirmation of the diagnosis was done in the laboratory of the Institute of Public Health in Tirana. The cases with CCHF were found in Has and Kukes. The symptoms of the patients were fever, high temperature, physical weakness, cephalgia, nausea and vomiting.

Keywords: CCHF, Albania, prevalence, clinical findings.

Abbreviations: CCHF – Crimean Congo hemorrhagic fever. ELISA- Enzyme linked immunoassay, PCR- Polymerase chain reaction

1. INTRODUCTION

Crimean-Congo hemorrhagic fever (CCHF) is a zoonotic viral disease that can be a serious threat to humans¹. The transmission of the virus is by ticks bite; by direct contact with blood or tissues from infected animals and infected persons¹. The transmissions through the air and horizontal communication have been suspected in some cases, but it is not managed to prove conclusively. Other reports determine a connection with the Crimean Congo Hemorrhagic Fever and travel^{2,3}. Nosocomial transmission among caregivers has also been reported. Clinical signs can vary from asymptomatic to clinical signs as high fever, myalgia, severe malaise, gastrointestinal symptoms, bleeding^{3,4,5}. CCHFV is endemic in large parts of the world and is regarded as a public health problem in these regions⁴. The aim of this study is to identify the situation of Crimean Congo hemorrhagic fever in Albania in suspected cases and to evaluate the clinical forms of the disease in Albania.

2. MATERIALS AND METHODS

We have collected all the cases suspected for CCHF from January 2013 to July 2016. The cases confirmed with CCHF were included in this study. The study was conducted at the Institute of Public Health in Tirana and in cooperation with the University Hospital Mother Teresa in Tirana and with district hospitals. The confirmation of the diagnosis was done in the laboratory of the Institute of Public Health in Tirana.

- Questionnaire

A structured questionnaire was conducted to all the patients suspected CCHF. The questionnaire was conducted in 3 parts. In the first part the variables considered in the questionnaire were: age, gender, living environment (rural/urban), occupation, history of tick bites, history of contact with livestock, signs and symptoms of the patients. This part of questionnaire was completed during an interview with the patients.

In the second part of the questionnaire, questions about laboratory findings (level of AST/ALT, level of creatinina, level of PT, level of leucocytes in serum etc.) were completed. Laboratory findings data were taken from the clinical record of the patients.

In the third part of the questionnaire, question about the differential diagnosis of the suspected cases with CCHF were completed. In this part the results of ELISA-test and PCR-test were reported. The results of ELISA-test and PCR- test were taken from the Institute of Public Health in Tirana. Only the questionnaire with confirmed CCHF patients was included in this second part of the study.

- Statistical analyses

All the data collected were analyzed by the use of SPSS. The descriptive data were calculated in frequencies, percentage and means values. Chi-square test (X²) was used for the association between categorical variables. A 'p' values lower than 0.05 ($p < 0.05$) was considered as statistically significant.

3. RESULTS

In this study 128 cases suspected for CCHF were taken. The patients with the same symptoms and signs, which didn't respond to the medical treatment, were included in this study. The table 1 gives a clear picture of socio-demographic data of 128 patients suspected for CCHF in Albania, from 2013 to 2016. The mean age of the patients included in the study is 43.7 ± 18.2 , were 61.7% of them are male, and 38.3% are female. 82.8% of the patients live in rural area, were 79.7% of them reported that they had contact with animals and 16.4% reported history of tick bite. Regarding the occupation of the patients, 58 patients or 45.3% of all cases, reported that they work as housewife and 39 patients or 30.4% of them that they work as farmer.

To all of these patients ($n = 128$), blood samples were taken and send for ELISA test. The blood samples, which were positive for ELISA IgM, were sent for PCR test. As we can see from table 2, we have 7 patients with IgM positive by ELISA-test and from them only 3 cases were confirmed with CCHF by PCR-test.

From 128 suspected cases with CCHF, only 3 cases or 2.3% of all cases were confirmed for CCHF by PCR. The mean age of patients with CCHF was 40.1 ± 17.7 years old, were 2 or 66.7% of cases were male and 1 or 33.3% of all cases were female. All the 3

cases with CCHF were presented in spring-summer of 2013 and had a history of tick bite. Regarding the occupation of the patients with CCHF, as is shown in table 3 all of three cases were housewife.

From table 4 we can see the distribution of suspected cases and confirmed cases with CCHF by years. As we can see, we have only 3 cases confirmed with CCHF in 2013. In the other years, we didn't found any case with CCHF. The cases, which were negative for CCHF, were diagnosed for other infection disease as; leptospirosis, Hantan etc.

Table 1 Socio-demographic data of cases suspected with CCHF from 2013-2016

Socio-demographic data	Total n=128
Age (mean ± St. Deviation)	43.7 ± 18.2
Male nr. (%)	78 (61.7%)
Female nr. (%)	50 (38.3%)
Risk factors	
Rural life	106 (82.8%)
Contact with animals	102 (79.7%)
Tick bite	21 (16.4%)
Farming-husbandry	89 (69.5%)
Animal tissue contact	16 (12.5%)
Contact with CCHF patients	0 (0%)
Occupation	
Farmer	39 (30.4%)
Housewife	58 (45.3%)
Student	3 (2.3%)
Healthcare workers	6 (4.7%)
Other	22 (17.2%)

Table 2 Distribution of CCHF cases that were confirmed by serologic test

Laboratory test	Nr. Positive
ELISA - IgM ,IgG	27
ELISA - IgM	7
PCR	3

Table 3 Demographic data of cases with CCHF

	Confirmed
Total nr (%)	63 (100%)
Age (mean ± st.Dev)	40.1 ± 17.7
Male	2 (66.7%)
History of tick bite	3 (100%)
Spring-Summer	3 (100%)

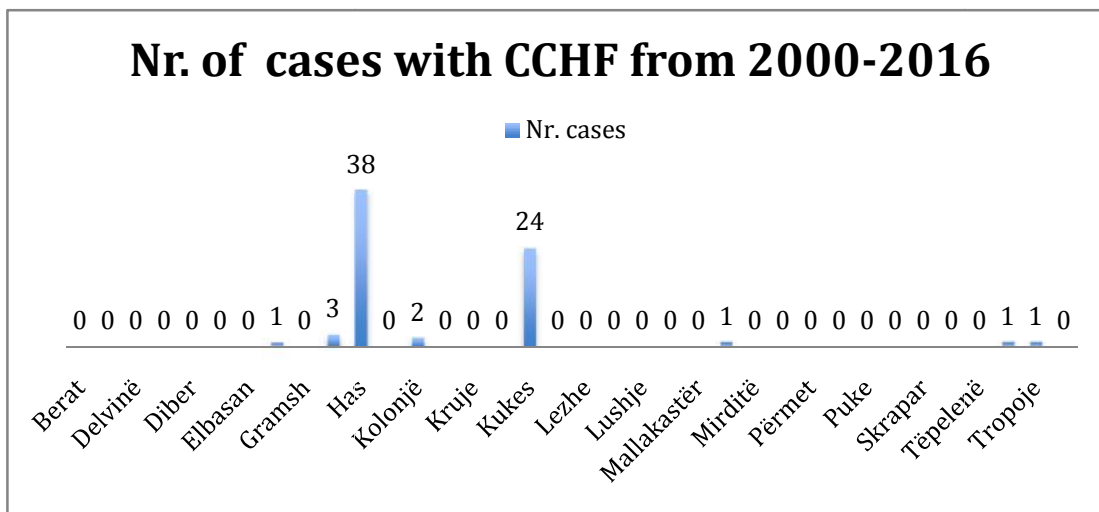
Occupation	
Farmer	0
Housewife	3 (100%)
Student	0
Other	0

Table 4 Distribution of cases suspected and confirmed with CCHF by years

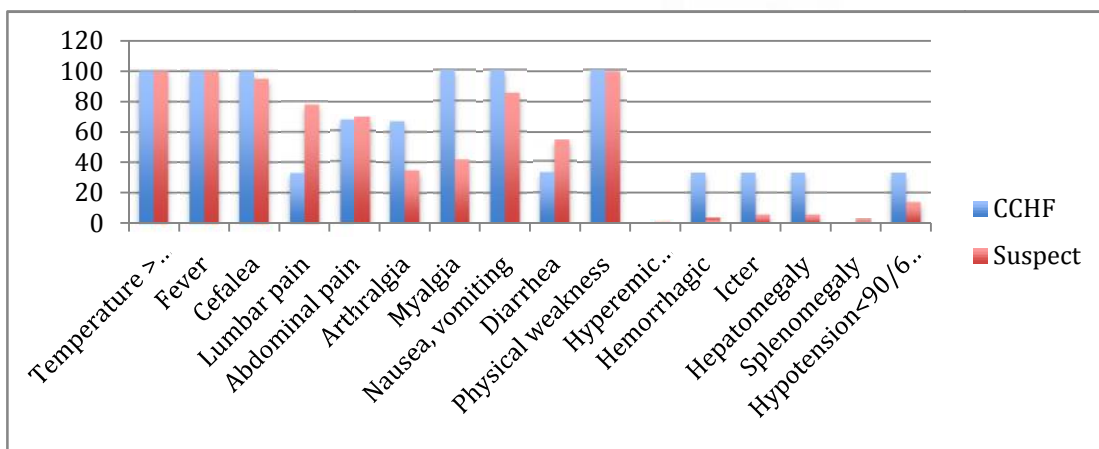
Year	Suspected n=128	Confirmed n=3
2013	68	3
2014	32	0
2015	19	0
2016	9	0
Total	128	3

Table 5 Symptoms and signs of cases and suspected with CHHF

Signs and Symptoms	Suspected n=128		Confirmed n=3		Total number of patients	P value
	Number	%	Number	%		
Temperature > 38.5°C	125	100	3	100	128	N.S
Fever	125	100	3	100	128	N.S
Cefalea	119	100	3	95	122	N.S
Lumbar pain	97	33	1	78	98	N.S
Abdominal pain	86	67	2	69	88	N.S
Arthralgia	44	67	2	35	46	N.S
Myalgia	52	100	3	42	55	N.S
Nausea, vomiting	106	100	3	85	109	N.S
Diarrhea	67	33	1	54	68	N.S
Physical weakness	124	100	3	99	127	N.S
Hyperemic conjunctiva	1	0	0	1	1	N.S
Hemorrhagic	5	33	1	4	6	N.S
Icter	7	33	1	6	8	N.S
Hepatomegaly	7	33	1	6	8	N.S
Splenomegaly	3	0	0	2	3	N.S
Hypotension <90/60 mmHg	18	33	1	14	19	N.S



Graphic 1 Distribution of Cases with CCHF by district, from 2000 to 2016



Graphic 2 Prevalence (%) of symptoms and signs in cases and suspects with CCHF

From Graphic 1 we can see that almost all suspected cases are found in Has and Kukës. Regarding the cases confirmed with CCHF, we found that all the cases were from Has district. Our findings are correlated with the distribution of cases with CCHF in years. Has and Kukës for some reasons are the two hot districts for the spread of cases with CCHF.

Regarding symptoms and signs we can see from table 5 that temperature > 38.5°C, fever, cefalea, nausea and vomiting, physical weakness and myalgia are represented in all cases with CCHF. Even in suspected cases we have a high prevalence of this symptoms, this because the selection of patients was set by the symptoms and signs and the impossibility to react to the medical treatment. We didn't find any significance between cases suspected and cases confirmed with CCHF regarding the symptoms and signs.

In the graphic 2 we can see the prevalence of symptoms and signs in cases and suspected with CCHF. The symptoms and signs are represented as percentile, and we can see the higher prevalence of fever, temperature, myalgia and physical weakness. The difference between cases and suspected with CCHF are seen in cases with hemorrhagic, hepatomegaly, and splenomegaly. Cases with CCHF have a higher prevalence.

4. DISCUSSION

The majority of cases with CCHF in Albania are from Has and Kukes, both situated in the north-east part of Albania. The northeastern part of Albania is characterized by a Mediterranean climate with a hot dry summer. The average summer temperature is 23-24° C. Winter is wet with the possibility of frost. Rainfall is higher. These climatic conditions are suitable for crops such as maize, vegetables, forges, vines and fruit trees⁴. Albania is one of the most vulnerable in the region to changing climate trends. In 15 years the weather has change with the increasing temperature^{6,7}. These changes in climate and their resulting effects on agriculture have an impact on the spread of the disease, because tick activity and CCHF risk increase with rising temperature^{6,7,8}.

Different studies has shown a higher prevalence of Hyalomma tick in sheep and cattle^{8,9}. Sheep and cattle are raised in Kukes and Has, which increases the possible contact of people with the animals and the ticks that have the virus of CCHF.

The diagnosis of CCHFV from blood and tissue samples, serology of the viral antigens, and antibodies against the viral antigen are used. Antibodies can be isolated by ELISA-test; PCR-test can also be used for the diagnosis of the viral genomic^{10,11,12}. Immunoflourescent test can also be performed to confirm serology of cases^{13,14,15}. In our study, diagnostic test were performed in the Institute of Public Health in Tirana. 128 blood samples suspected for CCHF were sent for the identification of Immunoglobulin IgM and IgG by ELISA-test. Cases positive for IgM were sent for PCR-test to confirm the diagnosis.

CCHF may be asymptomatic or with onset of symptoms which include fever, headache, fatigue, myalgia, nausea, vomiting and diarrhea. It can progress into organ failure in the other days^{16,17,18}. Generally, recovery time of patients takes 10 days. In our study, clinically mild or moderate cases generally had fever, physical weakness, myalgia, high temperature, nausea and vomiting, and hepatomegaly. The mean time of hospitalization of the patients was 11 days, were the longer time of staying in hospital was 22 days, and the shorter time of staying in hospital was 4 days.

Regarding the prognoses of the disease, in Albania we have only cases with good general condition, which represent the 81.8% of all cases, and we didn't found any case with aggravated general condition. We don't have case-fatality rate, which may be influenced by the fact of early diagnosis of the cases and the supportive treatment that is available in hospitals where cases with CCHF occur. Studies has shown a case fatality rate of up to 40%, especially in outbreaks^{18,19,20,21}.

5. CONCLUSION

From the suspected cases with CCHF from 2013 to 2016 in Albania, only 3 cases were confirmed from CCHF. Cases with CCHF were find in Has and Kukes. The symptoms of the patients were fever, high temperature, physical weakness, cefalea, nausea and vomiting. Suspected cases with Crimean-Congo hemorrhagic fever virus should be hospitalized, observed and after the differential diagnosis, an early treatment should be start as soon as the final diagnosis is confirmed.

SUMMARY OF RESEARCH

- 1.The main aim of this study is to identify possible causative agents that have a role in the transmission and spread of Crimean Congo hemorrhagic fever in different areas in Albania, to determine the impact of factors and to evaluate the clinical forms of the disease in Albania.
- 2.Identification and differential diagnosis of cases suspected with CCHF in Albania from January 2013 to August 2016.
- 3.To describe socio-demographic characteristics of the patients regarding time, place and person.
- 4.Analyzing the prevalence of clinical signs and symptoms.
- 5.To evaluate the laboratory data of patients.

FUTURE ISSUES

I believe that public heath intervention will play an important role in the prevention of the spread of Crimean Congo Hemorrhagic Fever in Albania. New researches in the field of seroprevalence and the detection of molecular diagnosis for the origin of Crimean Congo hemorrhagic fever in Albania, will prevent the spread of the disease.

DISCLOSURE STATEMENT

There is no special financial support for this research work from the funding agency.

ACKNOWLEDGMENT

I express a big gratitude to all the staff of Public Health Institute for the support.

REFERENCE

1. Vorou, R. M. 2009. "Crimean-Congo Hemorrhagic Fever in Southeastern Europe." *International Journal of Infectious Diseases* 13(6): 659–62.
2. Lukashev, Alexander N. 2005. "Evidence for Recombination in Crimean-Congo Hemorrhagic Fever Virus." *The Journal of general virology* 86(Pt 8): 2333–38.
3. Arikan, Inci, Nilgün Kasifoglu, Selma Metintas, and Cemalettin Kalyoncu. 2010. "Knowledge, Beliefs, and Practices Regarding Tick Bites in the Turkish Population in a Rural Area of the Middle Anatolian Region." *Tropical Animal Health and Production* 42(4): 669–75.
4. Agorastakis, Michalis, and Giorgos Sidiropoulos. 2007. "Population Change due to Geographic Mobility in Albania, 1989-2001, and the Repercussions of Internal Migration for the Enlargement of Tirana." *Population, Space and Place* 13(6): 471–81.
5. Papa, Anna, Silvia Bino, Evangelia Papadimitriou, Enkelejda Velo, Majlinda Dhimolea, and Antonis Antoniadis. 2008. "Suspected Crimean Congo Haemorrhagic Fever Cases in Albania." *Scandinavian journal of infectious diseases* 40(11-12): 978–80. <http://www.ncbi.nlm.nih.gov/pubmed/18609200> (April 6, 2015).
6. Papa, Anna, Silva Bino, Enkelejda Velo, Arjan Harxhi, Majlinda Kota, and Antonis Antoniadis. 2006. "Cytokine Levels in Crimean-Congo Hemorrhagic Fever." *Journal of Clinical Virology* 36(4): 272–76.
7. Papa, A., V. Dalla, E. Papadimitriou, G. N. Kartalis, and A. Antoniadis. 2010. "Emergence of Crimean-Congo Haemorrhagic Fever in Greece." *Clinical Microbiology and Infection* 16(7): 843–47.
8. Papa, A, S Bino, A Llagami, B Brahimaj, E Papadimitriou, V Pavlidou, E Velo, G Cahani, M Hajdini, A Pilaca, A Harxhi, and A Antoniadis. 2002. "Crimean-Congo Hemorrhagic Fever in Albania, 2001." *European journal of clinical microbiology & infectious diseases: official publication of the European Society of Clinical Microbiology* 21(8): 603–6. <http://www.ncbi.nlm.nih.gov/pubmed/12226691> (November 8, 2015).
9. Zavitsanou, Assimina, Fotoula Babatsikou, and Charilaos Koutis. 2009. "Crimean Congo Hemorrhagic Fever: An Emerging Tick-Borne Disease." *Health Science Journal* 3(1): 10–18.
10. Whitehouse, Chris A. 2004. "Crimean-Congo Hemorrhagic Fever." *Antiviral Research* 64(3): 145–60.
11. Humolli, Isme, Isuf Dedushaj, Tatjana Avsic Zupanac, and Sefedin Muçaj. 2010. "Epidemiological, Serological and Herd Immunity of Crimean-Congo Haemorrhagic Fever in Kosovo." *Medicinski arhiv* 64(2): 91–93.
12. Shepherd, a J, R Swanepoel, S P Shepherd, G M McGillivray, and L a Searle. 1987. "Antibody to Crimean-Congo Hemorrhagic Fever Virus in Wild Mammals from Southern Africa." *The American journal of tropical medicine and hygiene* 36(1): 133–42.
13. Flick, Ramon, and Chris A Whitehouse. 2005. "Crimean-Congo Hemorrhagic Fever Virus." *Current molecular medicine* 5(8): 753–60.
14. Atkinson, Barry, John Chamberlain, Christopher H Logue, Nicola Cook, Christine Bruce, Stuart D Dowall, and Roger Hewson. 2012. "Development of a Real-Time RT-PCR Assay for the Detection of Crimean-Congo Hemorrhagic Fever Virus." *Vector borne and zoonotic diseases (Larchmont, N.Y.)* 12(9): 786–93.
15. Chapman, L E, M L Wilson, D B Hall, B LeGuanno, E A Dykstra, K Ba, and S P Fisher-Hoch. 1991. "Risk Factors for Crimean-Congo Hemorrhagic Fever in Rural Northern Senegal." *Journal of Infectious Diseases* 164: 686–92.
16. Ergönül, Onder. 2006. "Crimean-Congo Haemorrhagic Fever." *The Lancet. Infectious diseases* 6(4): 203–14. <http://www.ncbi.nlm.nih.gov/pubmed/16554245> (February 15, 2015).
17. Kalvathev, N., and I. Christova. 2008. "One Step RT-PCR for Rapid Detection of Crimean-Congo Haemorrhagic Fever Virus." *Biotechnology and Biotechnological Equipment* 22(3): 864–66.
18. Liebisch, A. 1997. "General Review of the Tick Species Which Parasitize Sheep and Goats World-Wide." *Parassitologia* 39(2): 123–29.
19. Menne. 2012. "Protecting Health from Climate Change in Albania." WHO/BMU, MOH for Albanian Institution 1.
20. Weber, Friedemann, and Ali Mirazimi. 2008. "Interferon and Cytokine Responses to Crimean Congo Hemorrhagic Fever Virus; an Emerging and Neglected Viral Zoonosis." *Cytokine and Growth Factor Reviews* 19(5-6): 395–404.
21. Tarantola, Arnaud, Pierre Nabeth, Pierre Tattevin, Christian Michelet, and Hervé Zeller. 2006. "Lookback Exercise with Imported Crimean-Congo Hemorrhagic Fever, Senegal and France." *Emerging Infectious Diseases* 12(9): 1424–26.