



Knowledge Level of High School Students about Crimean Congo Hemorrhagic Fever

Lise Öğrencilerinin Kırım Kongo Kanamalı Ateşi Hakkında Bilgi Düzeyleri

Emsal AYDIN

Giresun University Faculty of Medicine, Department of Infectious Diseases, Giresun, Turkey

Abstract

Aim: The aim of this study is to determine the knowledge level of high school students about CCHF disease.

Material and Method: The population of the study, which was planned in descriptive type, consisted of 530 students in the first, second, third and fourth grades of high school, and 54.9% (n: 291) of the students were reached. Verbal consent was obtained from the students and they were asked to fill out the questionnaire consisting of 15 questions. Data were calculated using mean, frequency and percentage in SPSS database.

Results: In the study, although the students knew that the transmission was by tick contact, they did not have enough information about how the transmission was, what to do in case of tick contact and the symptoms of the disease

Conclusion: It is necessary to increase the knowledge level of students in order to prevent contagion. In order to increase the level of knowledge, the deficiencies of the students should be determined and the necessary training should be planned.

Keywords: Tick, Crimean Congo hemorrhagic fever, knowledge level, Bunyaviridae

Öz

Amaç: Bu çalışmanın amacı Lise öğrencilerinin KKKA hastalığı hakkındaki bilgi düzeyini belirlemektir.

Gereç ve Yöntem: Tanımlayıcı tipte planlanan çalışmanın evrenini, Lise birinci, ikinci, üçüncü ve dördüncü sınıfta bulunan 530 öğrenci oluşturdu ve öğrencilerin %54,9 (n: 291)'una ulaşıldı. Öğrencilerden sözlü onam alınarak 15 sorudan oluşan anketi doldurmaları istendi. Veriler SPSS veri tabanında ortalama, frekans, yüzde kullanılarak hesaplandı.

Bulgular: Çalışmada öğrenciler bulaşmanın kene teması ile olduğunu bilmelerine rağmen bulaşmanın nasıl olduğu, kene teması durumunda yapılması gerekenler ve hastalığın belirtileri hakkında yeterli bilgiye sahip değillerdi.

Sonuç: Bulaşmanın önlenmesi için öğrencilerin bilgi düzeylerinin artırılması gerekmektedir. Bilgi düzeyini artırmak için öğrencilerin eksiklikleri belirlenerek gerekli eğitimler planlanmalıdır.

Anahtar Kelimeler: Kene, Kırım Kongo kanamalı ateş, bilgi düzeyi, Bunyaviridae



INTRODUCTION

Crimean-Congo hemorrhagic fever (CCHF) virus is a negative-stranded, enveloped RNA virus belonging to the genus Nairovirus of the Bunyviridae family. It is carried by arthropods and transmitted to humans through tick bites. The clinical course ranges from asymptomatic to hemorrhagic fever, which can be fatal. Prevention is important due to the lack of specific treatment and the risk of mortality. The virus is resistant to the external environment and cannot survive outside the host. Geographically, the disease is found in Asia, Europe and Africa and can be transported to distant regions by birds. In our country, it can be encountered in all regions, being common in Eastern Black Sea, Central Anatolia and Eastern Anatolia. The disease, which starts to be seen in the spring months with the warming of the weather, decreases and ends in the fall. People who stay indoors during the winter are more likely to visit open areas in the spring, which increases the risk of contact with ticks and the associated CCHF virus transmission. Young people are more at risk because they are more likely to be in these areas as due to their dynamic nature. In this study, it was planned to measure the level of knowledge of young people to guide the trainings to be given in terms of prevention.

MATERIAL AND METHOD

The study was approved by Ankara City Hospital No: 1 Clinical Researches Ethics Committee (Date: 16/11/2022, Decision no: E1-22-.3019). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

The population of the descriptive study consisted of first, second, third and fourth grade high school students attending Science High School and Girls Vocational High School in Giresun City. The number of all high school students is 530. The sample was not selected and it was aimed to reach the whole population.

Verbal consent was obtained from the students and they were asked to fill out the questionnaire consisting of 15 questions. Data were calculated using mean, frequency and percentage in SPSS database.

RESULTS

The study was conducted in December 2022 with 291 students at Science High School and Girls Vocational High School in Bulancak district of Giresun province. While 79.4% (n:231) of the students knew correctly that tick bites transmit the disease, almost half of them did not know that the blood and secretions of animals and humans were infectious (43.3% (n:126) from animal and 49.5% (n:144) from humans) (Table 1).

Table 1: Students' level of knowledge about the transmission routes of CCHF disease (n=291)

	n	%
CCHF can be transmitted by tick attachment, picking, crushing or bursting the tick with bare hands		
That's right	231	79.4
Wrong	12	4.1
I don't know	48	16.5
CCHF can be transmitted to humans by contact with bodily fluids such as blood, urine and feces of animals with ticks on them.		
That's right	132	45.4
Wrong	33	11.3
I don't know	126	43.3
CCHF can be transmitted to other people through contact with the blood, urine and other excretions of people infected with the disease.		
That's right	105	36.1
Wrong	42	14.4
I don't know	144	49.5

88.7% (n:258) students knew that they should wear closed clothes in the field, vineyard, garden or picnic to protect themselves from the disease, 85.2% (n:248) students knew that they should check their body for ticks every time they return from a rural or picnic, and 70.1% (n:204) students knew where the tick can be found in the body most (Table 2).

Table 2: Students' level of knowledge about ways of protection against CCHF disease (n=291)

	n	%
In order to prevent CCHF, tucking trouser cuffs into socks, wearing closed clothes and wearing boots in the field, vineyard, garden or on a picnic are the most important methods to prevent the tick from attaching to humans?		
That's right	258	88.7
Wrong	6	2.1
I don't know	27	9.3
In order to prevent CCHF, it is absolutely necessary to check our bodies for ticks every time we return from a picnic or a picnic?		
That's right	248	85.2
Wrong	10	3.4
I don't know	33	11.3
Ticks most commonly attach to the back of the ears, armpits, groin and back of the knees?		
That's right	204	70.1
Wrong	18	6.2
I don't know	69	23.7

The level of knowledge on how to intervene when a tick is attached was low. 71.1% (n:207) knew how to remove the tick, 14.4% (n:42) knew what to do before removing the tick and 79.7% (n:232) knew that they could remove the tick themselves. 59.8% (n:174) did not know what to do for the disposal of their removed tick. 69.4% (n:202) knew incorrectly when to apply to the health institution after removing the tick. (Table 3)

74.9% (n:218) correctly recognized the clinical symptoms and 79.4% (n:231) correctly recognized the risk of death (Table 4).

Table 3: Students' level of knowledge on what to do after tick attachment (n=291)

	n	%
If we have a tick attached to our body, were move it ourselves with a cloth, a piece of paper or a pair of tweezers?		
That's right	51	17.5
Wrong	207	71.1
I don't know	33	11.3
If we have a tick attached to our body, we remove the tick ourselves, but before removing it, we pour cologne, alcohol or press a cigarette on it to make it come out of the skin more easily?		
That's right	42	14.4
Wrong	198	68.0
I don't know	51	17.5
If there is a tick attached to our body, there is no need to go to a doctor to remove the tick, there is no harm in removing the tick ourselves?		
That's right	28	9.6
Wrong	232	79.7
I don't know	31	10.7
In the disposal of a tick attached to your body after removing it from the body,		
The tick is crushed by hand or destroyed by bursting	24	8.2
The tick is thrown to the ground and crushed with the foot	12	4.1
The tick is put in a small bottle or jar with bleach and thrown in.	81	27.8
I don't know anything about his	174	59.8
A person with a tick attached after removing the tick from their body		
Go to the doctor immediately, at least the same day	149	51.2
Even if he/she does not have any complaints, he/she should definitely see a doctor within 10 days	53	18.2
Within 10 days, if you have complaints, you should definitely go to the doctor	53	18.2
I don't know anything about this	36	12.4

Table 4: Students' level of knowledge about the clinic of CCHF disease (n=291)

	n	%
The most important complaints when a tick-borne person becomes ill		
Cough, runny nose	14	4.8
Fever, malaise, body pain	218	74.9
Ear pain, itching on the body	26	8.9
I don't have any information on this	33	11.3
Is Crimean-Congo hemorrhagic fever a fatal disease?		
That's right	231	79.4
Wrong	15	5.2
I don't know	45	15.5

DISCUSSION

CCHF is an infectious disease and there is no specific treatment available. Prevention of transmission is important due to the risk of mortality. This can be achieved by raising awareness about the disease. Although the disease is more common in the northern parts of our country, it occurs in all regions, especially in rural areas during the summer season. It is important to raise awareness of people living in these regions as they are at risk.

Young people are in a period when they transition from childhood to adolescence and participate in many activities

due to their dynamic nature. As they gain their own identity, they isolate themselves from their families and try to spend time with their circle of friends. Due to their inquisitive and curious nature, they often spend time in environments where they can come into contact with ticks, especially in a long period starting in spring and lasting until fall. In addition, since we live in a patriarchal society, young people in farming families take part in the fields and among the animals to help the family during the summer periods. Families are weak in warning their children about the risks in these environments, and do not feel the need to provide extra education because they receive education at school. Despite education, young people are selective about information on many issues because their perceptions are variable. Due to the risk of CCHF, which is a mortal disease, knowing the level of knowledge of young people on this subject will direct the education to be given.

Warming weather causes ticks to multiply and increase their numbers in open areas. With the effect of animal transportation and migratory birds, these ticks spread to many regions and cause the disease to be seen in wider areas.^[1,2] In their study, Alkan-çeviker et al. emphasized that the patients who were hospitalized between 2010 and 2018 showed a clustering in the summer months.^[2] In our country, there are reports from many cities, more frequently in Eastern Black Sea, Central Anatolia and Eastern Anatolia.^[4] Increasing awareness of this disease, which is a public health problem, is an effective method to prevent transmission.

Transmission of the disease is most commonly caused by tickbites or crushing ticks with bare fingers.^[2] 16.5% of the students did not know this route of transmission and 4.1% knew it incorrectly. Since transmission can also occur through direct contact with blood or other bodily fluids of farm animals, CCHF is frequently encountered as an occupational disease among veterinarians, butchers and farmers who have contact with animals. Since human blood and body secretions also play a role in transmission, healthcare workers constitute another risk group.^[1,5-8] However, the fact that it is transmitted in this way causes individual other than healthcare workers to be at risk. However, transmission is not seen in other contacts such as hugging and shaking hands with the patient where blood and secretions are not present.^[9] In our study, about half of the students did not have sufficient information about the high potential for transmission through blood and body fluids. In this situation, uninformed young people may not pay the necessary attention to protect themselves in contact with sick animals and people.

The spectrum of clinical manifestations ranges from subclinical disease to acute infection with bleeding and multiple organ failure. Clinical manifestations of CCHF include nonspecific symptoms such as sudden onset of fever, headache, weakness, myalgia, photophobia, abdominal pain, nausea and vomiting. In severe cases, hemorrhagic symptoms are observed; petechiae, ecchymosis, epistaxis, nose bleeds, bleeding gums, melena, hematuria can cause

severe consequences. In this direction, 13.7% (n:40) of the students knew the symptoms of the disease incorrectly and 15.5% (n:45) did not know that it could be fatal.

CCHF has no effective treatment, so prevention of transmission of the disease comes to the fore. This is best achieved by preventing contact with ticks and animal body fluids. People living and traveling in endemic areas should be aware of personal protective measures against tick bites. Ticks can settle on all parts of the human body, including the trunk, extremities, head and neck.^[10] Therefore, when going to risky areas, it is absolutely necessary to check the body for ticks on return. Wearing light-colored clothes allows ticks to be easily detected. Intertwining clothes so that there is no open space minimizes tick exposure. In the questions asked to the students, 9.3% (n: 27) did not know the necessity of wearing closed clothes, 11.3% (n: 33) did not know the necessity of checking the body for ticks, and 23.7% (n: 69) did not know the places on the body that must be checked.

Prevention of tick contact against the disease is as important as the actions to be taken after tick attachment in preventing transmission. In case of tick attachment, the tick should not be held, crushed or squeezed with bare hands. Ticks should be removed with tweezers, the skin should be cleaned with antiseptic after removal and hand hygiene should be followed. In case of possible transmission of the disease, the person who comes into contact with the tick should monitor himself/herself for CCHF symptoms such as fever and bleeding for 10-14 days. As a result of the answers given by the students, it was seen that they misunderstood what they should do before and after the removal of the tick.

Although CCHF disease is subclinical in 88% of cases, it is mortal in 10-40% of cases. In the study, it was observed that students' awareness of the disease was insufficient.

CONCLUSION

Increasing the level of knowledge of people at risk of contact with this disease, especially in endemic areas, will reduce the morbidity and mortality rate of the disease. Young people spend more time in environments where the disease can be transmitted due to their active nature. Therefore, it is necessary to increase the awareness of students in terms of prevention of CCHF transmission and what to do in case of infection. Organizing trainings in schools in this direction will be effective.^[11]

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was approved by Ankara City Hospital No: 1 Clinical Researches Ethics Committee (Date: 16/11/2022, Decision no: E1-22-3019).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

- Messina JP, Pigott DM, Golding N, et al. The global distribution of Crimean-Congo hemorrhagic fever. *Trans R Soc Trop Med Hyg.* 2015;109(8):503-13.
- WHO. Introduction to Crimean-Congo Haemorrhagic Fever [06.12.2022] Available from: <https://www.who.int/publications/i/item/introduction-to-crimean-congo-haemorrhagic-fever>
- Alkan-Çeviker S, Günel Ö, Kılıç SS. Retrospective analysis of Crimean-Congo haemorrhagic fever cases. *Journal of Klimik* 2019; 32(3): 275-80
- Leblebicioglu H, Sunbul M, Guner R, et al. Healthcare-associated Crimean-Congo haemorrhagic fever in Turkey, 2002-2014: a multicentre retrospective cross-sectional study. *Clin Microbiol Infect.* 2016 ;22(4):387. e1-387.e4.
- Perveen N, Khan G. Crimean-Congo hemorrhagic fever in the Arab world: A systematic review. *Front Vet Sci.* 2022;9:938601.
- Vawda S, Goedhals D, Bester PA, Burt F. Seroepidemiologic Survey of Crimean-Congo Hemorrhagic Fever Virus in Selected Risk Groups, South Africa. *Emerg Infect Dis.* 2018;24(7):1360-3.
- Portillo A, Palomar AM, Santibáñez P, Oteo JA. Epidemiological Aspects of Crimean-Congo Hemorrhagic Fever in Western Europe: What about the Future? *Microorganisms.* 2021;9(3):649.
- Shahhosseini N, Wong G, Babuadze G, et al. Crimean-Congo Hemorrhagic Fever Virus in Asia, Africa and Europe. *Microorganisms.* 2021;9(9):1907.
- Gozel MG, Bakir M, Oztop AY, Engin A, Dokmetas I, Elaldi N. Investigation of Crimean-Congo hemorrhagic fever virus transmission from patients to relatives: a prospective contact tracing study. *Am J Trop Med Hyg.* 2014;90(1):160-2.
- Jang MS, Kim CM, Kim DM, et al. Comparison of Preferred Bite Sites Between Mites and Ticks on Humans in Korea. *Am J Trop Med Hyg.* 2016;95(5):1021-5.
- Yılmaz R, Özcetin M, Erkorkmaz U, Ozer S, Ekici F. Public Knowledge and Attitude toward Crimean Congo Hemorrhagic Fever in Tokat Turkey. *Iran J Arthropod Borne Dis.* 2009;3(2):12-7.