



Knowledge Levels Regarding Ticks and Crimean-Congo Haemorrhagic Fever Among Veterinarians, Nurses and Nursing Students

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Received: 28.06.2016

Accepted: 19.10.2016

SUMMARY

The aim of this study is to determine the knowledge levels regarding ticks and Crimean-Congo Hemorrhagic Fever among veterinarians, nurses and nursing students in Turkey. Survey was performed between July 2009 and April 2010 with a questionnaire consisting of 20 questions. Data were collected from 53 veterinarians, 62 nurses and 133 nursing students by face-to-face interviews. The people in the groups knew general characteristics of Crimean-Congo Hemorrhagic Fever, transmission of the disease and medical response with high percentage. Nursing students failed at the questions about general characteristics of ticks. Fourth-grade students were found more successful at 13 questions than other students, also nurses from Amasya were more successful at 16 questions than nurses from Bitlis. Veterinarians gave correct answers to 12 questions out of 20, nurses 6 out of 20 and students 1 out of 20 with the highest percentage and nurses and veterinarians answered one question with equal success. We have found that the participants of this survey have insufficient knowledge about some subjects for ticks and Crimean-Congo Hemorrhagic Fever. It is recommended that the health care workers should be informed about ticks and tick-borne diseases after graduation, also nursing students should receive education about vectors and vector-borne diseases.

Key Words: CCHF, Tick, Veterinary, Nurse, Student

ÖZET

Veteriner, Hemşire ve Hemşirelik Öğrencilerinin Keneler ve Kırım-Kongo Kanamalı Ateşi Yönünden Bilgi Seviyeleri

Bu çalışmanın amacı Türkiye'deki veteriner, hemşire ve hemşirelik öğrencilerinin keneler ve Kırım-Kongo Kanamalı Ateşi yönünden bilgi seviyelerini belirlemektir. Araştırma Temmuz 2009 ve Nisan 2010 tarihleri arasında 20 sorudan oluşan bir anket ile yürütüldü. Veriler; 53 veteriner hekim, 62 hemşire ve 133 hemşirelik öğrencisinden yüz yüze görüşme yolu ile toplandı. Gruplardaki kişilerin Kırım-Kongo Kanamalı Ateşi'nin genel özellikleri, hastalığın bulaşması ve tıbbi müdahale konusunda yeterli oldukları görüldü. Hemşirelik öğrencilerinin kenelerin genel özellikleri hakkındaki sorularda başarısız oldukları, dördüncü sınıf öğrencilerinin 13 soruda diğer öğrencilerden, Amasya'daki hemşirelerin 16 soruda Bitlis'teki hemşirelerden daha başarılı oldukları saptandı. Veteriner Hekimlerin 20 sorudan 12'sine, hemşirelerin 6'sına ve öğrencilerin ise bir soruya en yüksek düzeyde doğru cevap verdikleri gözlemlenirken, 1 soruyu ise hemşire ile veteriner hekimlerin eşit sayıda doğru olarak cevapladıkları tespit edildi. Bu çalışmanın katılımcılarının keneler ve Kırım-Kongo Kanamalı Ateşi ile ilgili bazı konularda yetersiz bilgiye sahip oldukları görüldü. Sağlık çalışanlarının mezuniyet sonrasında keneler ve kenelerle bulaşan hastalıklar konusunda bilgilendirilmesi, ayrıca hemşirelik öğrencilerinin vektörler ve vektörlerle bulaşan hastalıklar konusunda eğitim alması gerektiği kanaatine varıldı.

Anahtar Kelimeler: KKKA, Kene, Veteriner, Hemşire, Öğrenci

INTRODUCTION

Ticks and tick-borne diseases (TBDs) pose a great threat to public health because they can cause serious and fatal conditions. Ticks are obligate hematophagous arthropods that parasitize every kind of vertebrates in almost every region of the world and can cause anemia, toxication,

paralysis, irritation, allergy and also secondary infection because of skin lesion. Ticks are biological and mechanical vectors of viral, bacterial, rickettsial, spirochetal, protozoan and helminthic diseases (Jongejan and Uilenberg 2004). Crimean-Congo Hemorrhagic Fever (CCHF) is one of the most popular TBDs all over the world including Turkey. It is caused by viruses of the Nairovirus genus,

Bunyaviridae family (Ergönül et al. 2004; Deyde et al. 2006). *Hyalomma marginatum* is the main vector in Turkey but also the virus can be transmitted through contact with secretions or blood of infected human or animal (Tonbak et al. 2006). The disease is an important public health issue in Turkey because of its mortality rate and wide distribution (Ergönül et al. 2004; Yılmaz et al. 2009a; Gargılı et al. 2011). CCHF was not officially reported in Turkey before 2002, although epidemics were reported in neighboring countries (Maltezou et al. 2010). First case of CCHF in Turkey was diagnosed in 2002. Between May 2002 and June 2012, 6864 CCHF cases were reported and the mortality rate was recorded approximately as 5% in Turkey (Bakır et al. 2005; Yılmaz et al. 2009a; Anonymous 2012). Most of the CCHF cases were reported from the Central Anatolian and Central Black Sea region of Turkey (Güneş et al. 2011; Yağcı-Çağlayık et al. 2014).

Since CCHF virus can be transmitted nosocomially to some professionals such as animal breeders, butchers, doctors, soldiers, veterinarians, nurses etc., they are under high risk of the disease in endemic areas (Ergönül et al. 2007). Besides antibodies of CCHF virus were detected in healthcare workers (Ergönül et al. 2007; Mardani et al. 2007). Furthermore nursing students have potentiality to contact with patients with CCHF in hospital applications. Several studies were conducted to evaluate knowledge levels of various groups about ticks and one of the most popular TBDs: CCHF (Sheikh et al. 2004; Askarian et al. 2007; Rahnavardi et al. 2008; Yılmaz et al. 2009b; Arıkan et al. 2010; Çilingiroğlu et al. 2010; Özer et al. 2010).

Therefore it is important for these groups to have enough knowledge about ticks and CCHF in order to protect themselves and patients. This study was aimed to evaluate knowledge levels of veterinarians, nurses and nursing students in areas under risk of CCHF in Turkey.

MATERIALS and METHODS

Study area and survey participants

For this descriptive and cross-sectional survey, a questionnaire we prepared was conducted to veterinarians (n: 53), nurses (n: 62) and nursing students (n: 133) in Turkey. Data obtained from nurses were recorded in Amasya which is near the Kelkit Valley where CCHF was first detected in Turkey and also from Bitlis where CCHF has not been officially reported. Nursing students were selected from the Bitlis province. For veterinarians a pilot province was not selected and data were collected from 27 different provinces of Turkey (Afyonkarahisar (2), Ağrı (1), Aksaray (2), Amasya (1), Ankara (4), Antalya (1), Balıkesir (1), Bitlis (1), Bursa (2), Çankırı (1), Denizli (1), Edirne (1), Elazığ (2), Erzurum (1), Giresun (1), Hatay (1), İstanbul (1), İzmir (3), Kahramanmaraş (1), Kırıkkale (1), Konya (12), Nevşehir (1), Niğde (2), Samsun (3), Tekirdağ (1), Trabzon (1) and Yozgat (1)).

Survey instruments

A questionnaire (Table 1) consisting of 20 questions about agent, epidemiology, clinical features and prevention methods of CCHF and also about basic information about ticks was prepared from the literatures related to the subject (Parola and Raoult, 2001; Jongejan and Uilenberg 2004; Anonymous 2012). The information about the age, gender, education and job status was recorded but data not shown because of the parameters were not compared.

It was conducted to participants by face-to-face interviews between July 2009 and April 2010.

RESULTS

A total of 248 healthcare staff including 62 (25%) nurses, 53 (21.3%) veterinarians and 133 (53.6%) nursing students were surveyed during this study. Veterinarians answered 12 questions out of 20 correctly with the highest percentage than the other groups. Nurses have the second highest rate for correct answers to the questions with 6 out of 20. Nurses and veterinarians answered 16th question with equal success (%100). Finally students answered 5th question with the highest rate. Most of the students failed at 20th question with a rate of 5.26%. The eighth question was the most unknown question to nurses and veterinarians with 11.29% and 22.64% respectively. The detailed information about percentages of correct answers is shown in Table 1.

DISCUSSION

Ticks and tick-borne diseases are important health problems in Turkey and in other countries around the world (Gözalan et al. 2007; Aydın and Bakırcı 2007; Aydın et al. 2012; Aydın 2015; Aydın et al. 2015).

Therefore many people apply to the emergency services of hospitals with complaints of tick bite particularly during summer months (Değer et al. 2010). Healthcare workers are of prime importance for these patients with CCHF and at the same time they are under high risk of these diseases (Mardani et al. 2007). It is necessary that they have exact knowledge about TBDs because CCHF can be transmitted from patients to them. On the other hand, people applying to hospitals with complaints of tick bite need proper information. Nurses and nursing students can contact directly with patients in hospital applications and at the same time veterinarians have a mission to inform the public about zoonotic diseases and to take necessary precautions to prevent from these diseases. Due to these reasons, it is essential that the healthcare workers should have exact knowledge about these diseases.

Students, nurses and veterinarians knew that CCHF is a viral disease with the rate of 83.45%, 93.93% and 98.11% respectively. In previous studies; 75.3% of midwifery and nursing students (Özer et al. 2010), 67.1% of patients (Yılmaz et al. 2009b), 76.7% of nurses (Rahnavardi et al. 2008) knew viruses cause CCHF. Nurses, nursing students and veterinarians answered the question of "Adult ticks have wings and three legs" correctly with the rate of 18.79%, 54.83% and 75.47 respectively. The nurses from Amasya province answered the questions correctly with higher percentage than those in Bitlis. Furthermore when all groups are compared for this question, veterinarians were observed as the most successful group among others. Nevertheless, the ratio of accuracy of this question was found unexpectedly inadequate for all groups.

The main vectors of CCHF are *Hyalomma* spp. The knowledge that all tick species are not vectors of CCHF was known by 66.16% of students, 79.03% of nurses and 92.45% of veterinarians. Arıkan et al. (2010) asked this question to participants and 46.7% of them answered correctly.

While removing ticks from the body, alcohol/ether or fire should not be applied on to the tick, because such applications can increase likelihood of transmitting diseases by ticks. Veterinarians knew this knowledge with the rate of 71.69%, students 55.63 and nurses 77.41%.

Table 1. Analysis of correct answers given by participants in terms of profession

Questions and correct answers		Ratio of accuracy (%)										
		Students					Nurses			Vets	Total	
		1 (n:42)	2 (n:33)	3 (n:23)	4 (n:35)	T (n:133)	A (n:29)	B (n:33)	T (n:62)	T (n:53)	(n:248)	
1	CCHF is a viral hemorrhagic disease.	Yes	80.95	69.69	91.30	94.28	83,45	93.10	93.93	93,54	98,11	91,70
2	Adult ticks have wings and three legs.	No	23.80	30.30	17.39	11.42	18,79	75.86	36.36	54,83	75,47	49,69
3	All tick species can transmit CCHF.	No	47.61	60.60	78.26	85.71	66,16	79.31	78.78	79,03	92,45	79,21
4	It is advised that alcohol/ether etc. should be implemented on to tick while a person removing it from the body.	No	33.33	60.60	65.21	71.42	55,63	93.10	63.63	77,41	71,69	68,24
5	The mortality of CCHF is 100 %.	No	73.80	84.84	95.65	85.71	83,45	93.10	54.54	72,58	83,01	79,68
6	CCHF is fatal for animals.	No	35.71	54.54	60.86	68.57	53,38	93.10	69.69	80,64	86.79	44,67
7	There is a vaccine whose protectiveness is high against CCHF all over the world.	No	42.85	66.66	69.56	82.85	63,90	100.00	84.84	91,93	92,45	82,76
8	Breeding of poultry, such as partridge and pheasant, in nature is a good strategy to struggle with ticks.	No	14.28	21.21	8.69	20.00	16,54	10.34	12.12	11,29	22,64	16,82
9	CCHF is observed more frequently during summer months.	Yes	90.47	93.93	91.30	91.42	91,72	93.10	90.90	91,93	96,22	93,29
10	Ticks play a role in transmission of diseases other than CCHF in animals and people.	Yes	52.38	63.63	52.17	57.14	56,39	41.37	54.54	48,38	94,33	66,36
11	After removing the tick, that area of the body should be washed and cleaned with plenty of soap and water, and disinfected with the iodine antiseptic.	Yes	76.19	69.69	82.60	80.00	76,69	96.55	90.90	93,54	79,24	83,15
12	CCHF is characterized by fever, muscle pains, common cold, nausea, vomiting, diarrhea, flushing, bleeding and liver enlargement.	Yes	88.09	81.81	82.60	97.14	87,96	100.00	100.00	100,00	94,33	94,09
13	Incubation period of CCHF ranges from 2 to 14 days after tick bites, but it usually takes between 1-3 days.	Yes	47.61	66.66	65.21	77.14	63,15	96.55	75.75	85,48	86,79	78,47
14	CCHF virus is resistant to the external environment.	No	9.52	18.18	13.04	20.00	15,03	31.03	24.24	27,41	47,16	29,86
15	There is no need to isolate hospitalized patients with CCHF.	No	57.14	42.42	43.47	65.71	53,38	100.00	66.66	82,25	73,58	69,73
16	Animal breeders, veterinarians, farmers, nurses and soldiers are more likely to be exposed to CCHF.	Yes	90.47	84.84	82.60	97.14	89,47	100.00	100.00	100,00	100,00	96,49
17	The tick removed from a person must be killed by crushing.	No	52.38	51.51	69.56	45.71	53,38	93.10	60.60	75,80	54,71	61,29
18	CCHF virus can transmit to humans through direct contact with blood or tissues of viraemic animals.	Yes	64.28	66.66	47.82	71.42	63,90	86.20	57.57	70,96	54,71	63,19
19	The most effective method to fight against CCHF is to destroy ticks completely by applying insecticides to earth.	No	47.61	45.45	47.82	40.00	45,11	65.51	33.33	48,38	73,58	55,69
20	An engorged tick removed from a person attaches to a new person to suck blood if it is not put into a tube containing alcohol.	No	7.14	3.03	0	8.57	5,26	20.68	9.09	14,51	33,96	17,91

A: Amasya, B: Bitlis, 1: first grader, 2: second graders, 3: third graders, 4: fourth graders, Vets: Veterinarians

When we compared the students according to their classes, fourth-grade students were found more successful than others. This result is thought to be associated with that fourth-grade students receive more theoretical and practical training than others. Additionally nurses from Amasya were found more successful than those from Bitlis. This can be a result of that they encountered with the disease and tick bites more than others. Besides it can be associated with that they were trained postgradually on the subject.

Currently, there is no vaccine against CCHF used worldwide. This information was known by all nurses from Amasya. The ratio of accuracy was 63.90% in students and 92.45% in veterinarians. In a similar study (Yılmaz et al. 2009b), 56% of people knew there is no vaccine against CCHF.

Ticks transmit more than 200 pathogens including protozoan, bacterial, rickettsial, spirochetal and viral agents (Parola and Raoult 2001). Students, nurses and veterinarians knew that ticks play a role in transmission of other diseases other than CCHF in animals and people with 56.39%, 48.38% and 94.33% respectively. Veterinarians were found the most successful group for this question. This result may be due to the microbiology, protozoology and virology lessons they took during their bachelor education.

General characteristics of CCHF were known by students, nurses and veterinarians with 87.96%, 100% and 94.33% respectively. This rate was 71.1% for people (Yılmaz et al. 2009b). In another study (Özer et al. 2010) nursing and midwifery students stated the initial symptoms of CCHF are fever (93.7%), headache (65.9%), extreme fatigue, exhaustion (88.8%) and arthralgia-myalgia (68.6%).

We said the groups "The tick removed from a person must be killed by crushing". Unfortunately, some of the participants said "yes". Correct answers were observed 53.38% in students, 75.80% in nurses and 54.71% in veterinarians. However nurses from Amasya answered this question correctly with the rate of 93.10%. In a study (Çilingiroğlu et al. 2010), 49.6% of individuals said that ticks should not be killed by hands when seen. In another study (Arıkan et al. 2010), 83.7% of the people knew this information.

The health professionals should be informed about ticks and TBDs after graduation and also nursing students should be informed about emerging infectious diseases and arthropod vectors before their hospital practice in order to protect themselves and patients from the vector-borne infectious diseases.

In conclusion, we found insufficient knowledge level about ticks and CCHF in our study areas which are under risk of vector-borne diseases. Tick bites and related diseases are important problems for healthcare workers and their knowledge level should be increased after graduation via academic materials and also making them attend conferences or seminars related to the issue.

CONCLUSION

In conclusion, we found insufficient knowledge level about ticks and CCHF in our study areas which are under risk of vector-borne diseases. Tick bites and related diseases are important problems for healthcare workers and their knowledge level should be increased after graduation via academic materials and also making them attend conferences or seminars related to the issue.

ACKNOWLEDGEMENT

The authors extended thanks to lecturers of Health College, University of Bitlis Eren and healthcare worker Ferdi Akgül for their kind help during data gathering. Also we are grateful to the veterinarians, nurses and nursing students who participated to the survey. The authors declare that there is no conflict of interest.

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