

The Knowledge and Attitudes of People at High Risk for Crimean-Congo Hemorrhagic Fever: A Cross-Sectional Survey From an Endemic Region in Turkey

Mehtap Kartal,¹ Berna Aydin,² Necla Tulek,³ Ozlem Acicbe,³ Esra Tanyel,³ Nuriye Fisgin³

¹ Department of Family Medicine, Dokuz Eylul University School of Medicine, Izmir, Turkey

² Department of Forensic Medicine, Ondokuz Mayıs School of Medicine, Samsun, Turkey

³ Department of Clinical Microbiology and Infectious Diseases, Ondokuz Mayıs School of Medicine, Samsun, Turkey

Abstract

Background: Crimean Congo Hemorrhagic Fever (CCHF) has occurred in Turkey since 2002. It has become a growing problem for the country; both the number of cases and the number of geographical regions affected have increased.

Aim: To evaluate the knowledge and attitudes of high-risk people for CCHF and to discuss the possible educational approaches.

Methods: The study was a cross-sectional, descriptive one conducted in an endemic region in November 2008. The questionnaires covering socio-demographical characteristics of the participants, their or their relatives' experiences with ticks and CCHF disease, their knowledge about its transmission, protection and their information sources, were applied by face-to-face interviewing.

Results: Most of the participants were male, graduated from elementary school, engaged in agriculture and/or animal husbandry. Of them, 19.8% had been bitten by a tick at least once and one had been hospitalized with CCHF disease. Although they were living in an endemic region; the percentage of whom hearing CCHF (58%) and aware of its transmission (33.3%) were low. They (71.6%) did not know how to remove the tick from the skin. Information regarding CCHF was generally obtained through television (33.5%) and health workers (23.1%). They (71.6%) expressed their need to be informed.

Conclusion: The need to educate the public about CCHF and the ticks is at an alarming level. These trainings should be structured with the appropriate use of visual and written media via collaborative approach together with community-based medical education strategies.

Keywords: Crimean Congo Hemorrhagic Fever, ticks, community-based education

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Introduction

Crimean Congo Hemorrhagic Fever (CCHF) disease was first identified in Turkey in 2003 in individuals who got sick during the 2002 outbreak.¹⁻⁴ While official numbers of CCHF cases reported by the Ministry of Health was 150 for 2002-2003, the figure rose to 1315 for 2008 and there were 63 fatalities (Table 1).⁵ In addition to these the number of provinces in which the cases seen are increasing.⁵⁻⁷

CCHF is caused by a Nairovirus, a group of related viruses forming one of the five genera in the Bunyaviridae family of viruses. In the spread of this zoonosis to humans, the main role is that of ticks; however, transmission is also possible via blood, tissue and body fluids of infected people or animals.⁷ The incubation period of the disease is generally 1-3 days after tick bites and 5-6 days in case of contact with infected materials and can be changed according to various factors including viral dose and route of exposure.⁷⁻⁹

Individuals in the rural regions engaged in agriculture and animal husbandry are especially under risk.⁸⁻¹⁰ As of today, there is no effective treatment nor a vaccine for the disease. Supportive therapy is the main component of the management; additionally an antiviral, ribavirin, is recommended for infected patients however its mechanism of

CORRESPONDING AUTHOR

Mehtap Kartal
Address: Dokuz Eylul University, Department of Family Medicine,
Inciralti 35340, Balçova/Izmir TURKEY.
Phone number: +90-232-4124954
Fax number: +90-232-2590541.
E-mail: mehtapkartal@gmail.com, mehtap.kartal@deu.edu.tr

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action is not well-known and passive immunotherapy are options that are worked on.^{8,9,11} Until to the development of effective disease-interruption strategy, personal protections are of utmost importance for the prevention of the disease. For the risk groups generally with low educational level and low economical status, the knowledge level and attitudes about ticks and the spread of CCHF should be assessed, this is important for the applying individually effective measures to decrease disease transmission and further spread and possible epidemics in the community. Our aim in this study was to determine the CCHF-related knowledge levels of the individuals under risk, their knowledge and attitudes about ticks and to discuss possible approaches to be used based on the data in hand.

METHODS

The study was planned as a cross-sectional, descriptive one. It was conducted in November 2008 in an endemic region to the high-risk people; in the villages from where some patients had been previously diagnosed and treated at Ondokuz Mayıs University (OMU) School of Medicine (Kiziroglu and Imirler villages of Gumushacikoy subprovince as well as Ogulbagi village of Suluova subprovince of Amasya province). The study was carried out in a convenience sample. In this study, we applied the questionnaires with face-to-face interview method. Sociodemographical characteristics of the participants, the experiences of them or their relatives had with ticks and CCHF disease, their knowledge level about transmission and protection from disease and the information sources they use were questioned with a 24-item questionnaire. The last question consisted of a picture of a hyalomma, and they were asked to name this picture. Approval of the Ethics Committee of OMU was obtained and participants signed informed consent forms before entering the study. Village headmen were the first people met in those villages and information was obtained about their training efforts for the disease in their region.

Table 1: Number of cases and deaths of Crimean-Congo hemorrhagic fever reported in Turkey in 2002-2007.

Years	Cases	Deaths
2002-2003	150	6
2004	249	13
2005	266	13
2006	438	27
2007	717	33
2008	1315	63

RESULTS

Of the 81 participants of the study, 56 (69.1%) were men and mean age was 54.65±14.54 (median=56, range=17-80) years. Of the participants, 60.5% were

elementary school graduates. Fifty-eight (71.6%) participants were working in agriculture sector and/or were dealing with animal husbandry, of whom 23 (28.4%) reported being involved in slaughtering of animals as well.

Table 2: Sociodemographic characteristics of the participants (n=81)

Characteristics	n	(%)
Gender		
Men	56	69.1
Women	25	30.9
Age groups		
<45	19	23.4
45-54	17	21.0
55-64	23	28.4
>64	22	27.2
Education		
Illiterate	15	18.5
Literate	4	4.9
Elementary school	49	60.5
Middle school	7	8.7
High school and university	6	7.4
Villages		
Imirler	34	42.0
Kiziroglu	28	34.6
Ogulbagi	19	23.4
Occupation		
Agriculture and/or animal husbandry	58	71.6
Retired/Housewives/Not working	18	22.2
Civil servants	2	2.5
Headman of the village	3	3.7

Forty-seven (58%) participants mentioned that they heard about a disease called "Crimean Congo hemorrhagic fever" and of whom 31 (38.3%) declared that they knew how the disease spread as well, however 27 (33.3%) of them said that the disease was transmitted by tick bites and others mentioned about transmission with blood, wounds and animals.

Table 3: The distribution of the answers provided by the participants to the question "What have you done upon seeing a tick?" (n=70)

What have you done upon seeing a tick	Number	%
I have not done anything	29	41.5
I medicated the animals	21	30.0
I burned it	6	8.6
I smashed it with a stone	5	7.1
I pulled and discarded it	4	5.7
I stepped on it and killed it	3	4.3
I protected myself	1	1.4
I did not take my cattle to the field	1	1.4

Seventy participants (86.4%) had seen a tick and it was most commonly seen during spring and

summer months (51.9%). Sixteen (19.8%) participants reported having been bitten by a tick at least for once, 11 reported that the bite occurred while working in the field/garden. Of the individuals bitten, 11 had removed the tick by their hands, only five of them had admitted to a health facility and one of them had been hospitalized with the diagnosis of CCHF in the summer of 2007, and he could not notice the tick on his body. Ten participants reported at least one acquaintance who suffered CCHF. The answers of the question "What have you done upon seeing a tick?" are summarized on Table 3. At least one relative of 28 (34.6%) participants had been bitten by a tick in last three years, mostly when they were in the field/garden. Of the people bitten, 19 admitted to a health facility and six of them (31.6%) got sick.

Table 4: The distribution of the results provided by the participants to the question "What would you do to protect yourself from the tick?" (n=132)

What would you do to protect yourself from the tick?	Number ^a	%
I wear boots on my feet, if not I tuck the ends of my pants into my socks	45	34.0
I use appropriate medication for the ticks in the farm for my livestock	21	15.9
I don't know	14	10.6
I cover open parts of my body with a bug repellent medication	14	10.6
I make frequent checks to see if there are any ticks on my body	12	9.1
I wear stuff to cover all my body	11	8.3
I put medication on my clothes	6	4.5
I don't work in the field, I don't go to the farm	2	1.5
I wear gloves	2	1.5
I stay at a distance from animals	1	0.8
I burn the tick	1	0.8
I do not touch the tick	1	0.8
I don't do anything	1	0.8
There is no need to be protected	1	0.8

^a34 people provided more than one response.

Of the participants 52 (64.2%) said that the person bitten by a tick will get sick, 18 (22.2%) said that they will sometimes get sick and this will occur upon being bitten by certain types of tick, 6 (7.4%) said these people will not get sick and 5 (6.2%) had no information about the topic. Only 10 participants could pronounce the name "Crimean Congo Hemorrhagic Fever" correctly.

To the question "Do you know how to protect yourself from the tick?" 55 (67.9%) participants answered as "yes", 23 (28.4%) as "no", two participants as "a little" and one said that there was no need to be protected. The answers provided to the question "What would you do to protect yourself from the tick?" are listed on Table 4.

Twenty-three (28.4%) participants reported that they know how to remove a tick. The answers provided to the question "What would you do when you see a tick on the skin?" are summarized on Table 5.

Table 5: The distribution of the answers provided by the participants to the question "What would you do when you see a tick on the skin?" (n=81)

What would you do when you see a tick on the skin?	Number	%
I go to the nearest health facility before doing anything	45	55.5
I remove it by hand	12	14.8
I do not know	5	6.2
I take it out by a tweezer	5	6.2
I squeeze and kill it upon seeing the tick	3	3.7
I take the tick out and then go to the nearest health facility	3	3.7
I take the tick out by keeping it as a whole and moving it from left to right as if a nail.	2	2.5
I burn it with a lighter	2	2.5
I cut it with nail clippers/knife or other sharp object	4	4.9

Eleven participants reported removing ticks from their own skin and eight from animals adding up to 19 (23.5%) participants in total. The ticks were mostly removed by hand (14 participants).

The village headmen of all three villages reported having been informed both by the teams of the Ministry of Health and those of Ministry of Agriculture and information brochures were seen in the community hall of these villages. Forty-five participants (33.5%) reported having been informed about "Crimean Congo Hemorrhagic Fever" via television; eight (6.0%) participants reported not having any information about this topic (Table 6).

Table 6 The distribution of the answer provided by the participants to the question "Wherefrom /whom did you get the information about Crimean Congo Hemorrhagic Fever and ticks?" (n=134)

"Where/from whom did you get the information about this topic?"	Number ^a	%
From television	45	33.5
From health workers	31	23.1
From family members, relatives, neighbors, acquaintances	18	13.4
From the agriculturists of the Department of Agriculture and Rural Affairs visiting the village	12	9.0
From the brochures of the Ministry of Health	12	9.0
From newspapers and magazines	8	6.0
I do not have any information	8	6.0

^a33 people provided more than one response

Of the participants, 58 (71.6%) reported needing information on "Crimean Congo Hemorrhagic Fever" disease and ticks; 49 (60.5%) said that they would like to see health workers (51.8%) in their villages (60.5%) at any given time (43.2%) to deliver information about this topic. When asked how this training should take place, they mentioned their expectations as one-to-one teaching (58.0%) and use of visual material together with this teaching (8.6%).

Of the participants, 91.4% correctly identified the image they were shown as "tick", 1.2% named it as "Crimean tick", 7.4% reported not knowing what it was.

While answering the questions, some participants made quite interesting remarks. Examples about the ticks were as follows:

... The tick on the animals is harmless; the ones in the field and farms cause disease...

... If the tick is poisonous it will cause a disease...

... There are different types of tick, if the tick spreading "Crimean Congo" bites, there will be a disease...

... The ticks in our village are round, these don't cause disease, thin ticks cause disease...

... The ticks seen during summer are dangerous, those seen in winter are not...

... Poisonous ticks do not live in this village...

There are striking explanations about how to remove a tick.

I either pour gasoline on the tick or burn it directly with a lighter ...

I will take the tick out with my hands and take it to the hospital...

I take the tick out and smash it with my hands...

They provided us medications last year; we did not use them as there were no ticks...

You should cut the tick with a nail clipper, you should not take the head out, and it should dry by itself and come out...

DISCUSSION

Health needs of the society are changing on a daily basis as well as the scope and the dimension of the diseases. Turkey is experiencing one of the largest CCHF related outbreaks in the world, the numbers of cases are increasing and the area affected is getting larger.

Most of the participants in our study were men (69.1%) and were educated at elementary school level (60.5%) and were engaged in agriculture and/or animal husbandry for income generating purposes (71.6%). Despite living in three villages where cases of Crimean Congo Hemorrhagic Fever were seen, the percentages of hearing about a disease called Crimean Congo Hemorrhagic Fever (58.0%) and knowing that it spread with a tick bite (33.3%) were found to be low. These findings demonstrate the need to for more education about the prevention of this disease.

Majority of the participants reported seeing ticks mostly in spring and summer months. Nearly one out of every five participants had history of at least once tick bite while working in the field/farm. Of those bitten, one out of three applied to a health facility and one of the participants had been hospitalized for the treatment of CCHF. One in every three participants had an acquaintance that had been bitten by a tick when working in the field/farm and six of them got sick. The ratio of participants reporting that the individual bitten by the tick will not get sick and that they do not know anything about the issue is 13.6%. All these findings show us that the participants of this study constitute an important risk group for tick exposure and CCHF. That is why they also make a good target group for education purposes.

Despite these findings showing us that they are not away from the ticks or CCHF, having people who do not know how to be protected from ticks (28.4%) and one person reporting that there is no need for protection points out the lack of information in a striking manner. Moreover, most of the participants (71.6%) reported not knowing how to take out the tick they find on the skin. When they see a tick on the skin, they mostly prefer to go to a health facility before doing anything (55.5%), however, there are also those who choose to take it out by hand, smash it like a mosquito, burn it with a lighter or cut it with a nail clipper. This was something reported at theoretical level but had practical implications as well. Of 19 participants who have reported taking the ticks out, 14 did it by hand. Ticks never be tried to be handled by bare hand. The body of the ticks are never be squeezed or crushed because its fluid may contain infective material and this can push into the wound site. Also heating or substance like gasoline, lidocaine will never be applied. Early removal of ticks is another important point that can be well-known for prevention as at least 24 to 48 hours of attachment to the host are required before infection occurs. Proper way of tick removal is grasping its body gently and pulling upward with steady, even traction applied with fine-tipped, angled forceps until it dislodges. Improper techniques trial for the removal of a tick can lead to remain of some parts of tick ending with infection or granuloma formation.¹² While they were living in an endemic area and under high-risk, they were removing ticks from skin by a couple of dangerous ways. It obvious that, in addition to being informed, they certainly need the skills required to remove the ticks.

The study population is limited with certain number of participants and living in a certain region. However, it demonstrates the urgent educational needs especially for protection from the disease. For

this need to be met there has to be a regulation at national level which is systematic, comprehensive and open to cooperation. In the struggle against CCHF, improving the knowledge, skills and attitudes of physicians, medical students and other health staff should be the initial step as studies reported that they have a gap and lack of knowledge.¹³ However, vector-transmitted zoonotic diseases like CCHF necessitates a multi-faceted approach, it causes outbreaks and can lead to fatalities that is why community education is clearly indispensable. In the efforts to educate the public, Ministry of Health, Ministry of Agriculture, civil society organizations and universities should collaborate with the significant contributions of “Community Based Medical Education (CBME)” strategies. CBME is a tool linking the education to the needs of the public and it is utilized by the innovative medical schools nearly for the last 20 years.¹⁴ Service oriented CBME programs include all levels of services starting with the treatment in primary care and leading to services aiming at improving the community together with the inclusion of the community itself.¹⁵ In such programs, universities and other parties work together for the solution of health, education and other problems of the public by having the participation of the public. Therefore, the service, education, and research is performed in a cooperative manner by students, faculty members and other health staff (Figure 1).¹⁶ These programs yielded positive results especially in the struggle with infectious diseases. One the one hand, students and health staff continue their education in the community and on the other hand, the disease-related information, skills and attitudes of the public can be increased with the help of a long-lasting systematic program. Although they require a long-term structure, these programs are more effective than short-term informational meetings.¹⁴

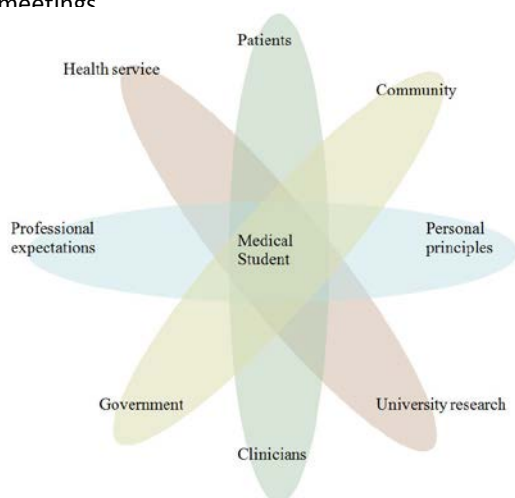


Figure 1: Worley's integration model based on four basic axis¹³

Participants of our study reported that they obtained tick and CCHF-related information mostly from television (33.6%) to be followed by health workers (23.1%), family, neighbors, and acquaintances (13.4%). Although this is the case, there are several people (71.6%) expressing their need for further information. They mostly mentioned that they had anticipated the fulfillment of this need at any given time by health workers in their villages through one-to-one teaching.

One of the issues to be emphasized in the education of the public is the need to equip the individuals with the information and skills to help them remove the tick and to eliminate it as necessitated by the spread routes of CCHF. For example small groups can be formed to convey general information about CCHF and to discuss the disease; to show how to get the tick out can be presented then individuals should be given the opportunity to try for themselves and they should be given feedbacks by demonstration-coaching. Field sightseeing can be organized with small groups, identifications can be made and these can be discussed within the groups. Films and videos about CCHF can be shown; individuals or leaders to be selected from within the community can be trained as trainers and microteaching can be done by organizing trainings in which these individuals are trainers.^{13,17}

CONCLUSION

CCHF is a disease spreading with arthropods, it is hard to control, does not have an effective treatment or a vaccine; for such diseases educating the public is of utmost importance. Educating the public should not be limited to conveying the information, strategies should be provided to equip the individuals with required attitudes and skills; to this end written and visual media can be effectively used within the framework of a long-lasting systematic program. For this purpose, CBME strategies supporting cooperation in between Ministry of Health, Ministry of Agriculture, universities and civil society organizations is recommended.

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