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Original Article

Health-Related Quality of Life and the Prevalence of Post-Traumatic Stress Disorder among Crimean-Congo Hemorrhagic Fever Survivors

Serdar Gul[1], Esen Uz Gul[2], Murat Yesilyurt[1], Baris Ozturk[3]*, Ferit Kuscu[3], and Onder Ergonul[4]

[1]*Department of Infectious Diseases and Clinical Microbiology and*
[2]*Department of Psychiatry, Sorgun City Hospital, Yozgat;*
[3]*Department of Infectious Diseases and Clinical Microbiology,*
Diskapi Yildirim Beyazit Education and Research Hospital, Ankara; and
[4]*Department of Infectious Diseases and Clinical Microbiology,*
Marmara University, Istanbul, Turkey

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SUMMARY: Crimean-Congo hemorrhagic fever (CCHF) is a potentially fatal infectious disease, and it is endemic in Turkey. Patients are placed in isolation when hospitalized, and some may require blood transfusions. Moreover, some patients may require admission to intensive care units (ICU). CCHF is not a recurrent disease, and relapses are not expected. Therefore, no medical follow-up is conducted on recovery from CCHF. In this study, health-related quality of life (HRQL) and the presence of post-traumatic stress disorder (PTSD) among CCHF survivors were evaluated 12 months after recovery from the disease. PTSD diagnosis was established by DSM-IV-TR criteria and HRQL was investigated by using the Medical Outcomes Study Short Form 36. This study included 54 patients. Our results showed that 48.1% of the patients had PTSD symptoms and 18.5% had PTSD. PTSD incidence was higher among patients who required an ICU stay, who had bleeding, and who required blood transfusion. In addition, 4 out of 8 dimensions of HRQL were impaired. However, none of these patients admitted psychiatric problems to health care professionals. Our findings revealed that periodic psychiatric evaluation should be performed on CCHF patients, and they should be provided medical support, if required.

INTRODUCTION

Health-related quality of life (HRQL) is an individual's satisfaction or happiness with the various aspects of life that have an effect on health or are affected by health. Post-traumatic stress disorder (PTSD) is a severe anxiety disorder, which results from an exposure to an extremely traumatic stressor involving direct personal experience such as the following: (i) actual or threatened death or serious injury, (ii) other threat to one's physical integrity, (iii) witnessing of an event that involves death or injury, or (iv) a threat to the physical integrity of another person (1). Diagnostic symptoms for PTSD include reexperiencing the original trauma(s) through flashbacks or nightmares, avoidance of stimuli associated with the trauma, and increased arousal—such as difficulty in falling or staying asleep, anger, and hypervigilance. Formal diagnostic criteria require that the symptoms last more than 1 month and cause significant impairment in social, occupational, or other important areas of functioning (1).

Crimean-Congo hemorrhagic fever (CCHF) is a potentially fatal, tick-borne zoonosis. It is seen in Africa, Asia, Eastern Europe, and the Middle East. The mortality rates vary from 3% to 30%. Humans get infected primarily through tick bites; however, direct contact with a CCHF patient or contact with blood or tissue from viremic livestock can also lead to an infection (2).

In Turkey, 4,453 patients were diagnosed with CCHF and 218 of them died due to this disease since 2002 (3). The disease has the following four phases: incubation, pre-hemorrhagic, hemorrhagic, and convalescence. Patients are hospitalized usually for 9–10 days. The hemorrhagic phase generally starts on the 4th or 5th day after infection and has a relatively short duration (4). Bleeding can be seen in varying degrees from petechia to big hematomas. In addition, gingival, vaginal, nasal, cerebral, gastrointestinal, intra-abdominal, and urinary system hemorrhages can be observed. Patients should be isolated because the disease can spread through blood or body secretions (4).

Most patients recover without complications and sequelae. However, the data regarding the psychiatric morbidity of the disease is very limited. The disease is life threatening in nature and can cause bleeding from various systems. Patients have to be isolated, and the disease leads to a fear of infection among the family members. These factors make the disease an unbearable experience (5). The patients are not followed up because relapse is not expected. Because survivors of other serious diseases such as severe acute respiratory syndrome (SARS), myocardial infarction, endocarditis, Legionnaires' disease, and sepsis have been shown to be psychologically affected by their conditions (6–12), we expect similar psychiatric morbidity among CCHF survivors. The social aspect of the disease is important because majority of the patients are young, actively

*Corresponding author: Mailing address: Department of Infectious Diseases and Clinical Microbiology, Diskapi Yildirim Beyazit Education and Research Hospital, Ankara, Turkey. Tel: +90 312 596 2794, Fax: +90 312 318 6690, E-mail: dbarisozturk@yahoo.com

employed, and are forced to live in the same environment with ticks.

MATERIALS AND METHODS

In this study, we aimed to evaluate the presence of PTSD 12 months after the disease and its effect on the HRLQ among CCHF survivors.

Study design: The present study was conducted in the Yozgat province of Turkey. Patients who survived CCHF (12 months after discharge) were included in the study. Patients aged less than 18 years, those in the manic episode of bipolar disorder, those with mental retardation, or those having psychotic disorders were excluded. CCHF diagnosis was done by Refik Saydam National Hygiene Center, based on the anti-CCHF IgM or positive PCR results. Patients' demographic information, medical follow-up during the period of active disease, and medical procedures carried out during hospitalization were collected.

Psychiatric analysis: CCHF patients were examined by our research psychiatrist. In the current study, PTSD diagnosis was established by DSM-IV-TR criteria. There were 17 items in the questionnaire to diagnose PTSD according to the DSM-IV-TR. Patients were not informed that the questionnaire was about PTSD. HRQL was evaluated by using the Medical Outcomes Study (MOS) Short Form 36 (SF-36). MOS SF-36 is a self administered, generic, multidimensional measure of HRQL (13). Each dimension was scored from 0 to 100 with higher scores indicating better quality of life. In the present study, the patients' average SF-36 scores were compared with the average scores of a control group (60 healthy subjects matched sociodemographically with the study group) and the Turkish population (14).

Statistical analysis: For the analysis of the data, SPSS 15.0 software was used. Patients were divided into two groups: one with a PTSD diagnosis and another without a PTSD diagnosis. For correlations, the Mann-Whitney *U*-Test and χ^2 test were used. For the comparison of average SF-36 scores of patients diagnosed with CCHF and the average scores of the Turkish population, One Sample Test was chosen. A P value <0.05 was considered as statistically significant.

RESULTS

In Yozgat province of Turkey, 132 patients were diagnosed with CCHF; in 2009, 6 patients (4.54%) died from the disease. Fifty-four patients were included in this study. The remaining patients could not be included owing to various reasons (30 patients could not be reached, 21 patients refused to participate, 19 were aged less than 18 years, and 2 had mental retardation) without introducing any selection bias. Forty-three patients (79.6%) were men, and the mean age was 41.6 years (S.D. = 17.2). Psychiatric examination of the patients revealed that 28 patients (51.9%) had no PTSD symptoms. Twenty-six patients (48.1%) exhibited PTSD symptoms. The symptoms exhibited were reexperiencing the original trauma(s) through flashbacks or nightmares, avoidance of stimuli associated with the trauma, and increased arousal—such as difficulty in falling or staying asleep, anger, and hypervigilance. Ten patients (18.5%) were diagnosed with PTSD. In 16 patients (29.6%), PTSD symptoms were present; however, this was insufficient to establish a PTSD diagnosis. None of our patients reported increased alcohol use. Demographic and environmental characteristics, medical procedures carried out during the hospitalization of patients with and without a PTSD diagnosis, and their odds ratios are shown in Table 1. These risk factors were selected as they were thought to be possibly correlated with the psychiatric outcomes of the patients based on our experience and thorough literature review.

Table 1. Examined risk factors for PTSD

	PTSD		P	Odds ratio
	Yes no./mean (%/sd)	No no./mean (%/sd)		
Sex				
Female	2 (18.1)	9 (81.9)	0.974	0.9
Male	8 (18.6)	35 (81.4)		
Age (yr)	44.20 (12.28)	41.33 (18.25)	0.632	
Marital status				
Yes	8 (20.0)	32 (80.0)	0.636	1.5
No	2 (14.2)	12 (85.8)		
Family history				
Yes	3 (37.5)	5 (62.5)	0.134	3.3
No	7 (15.2)	39 (84.8)		
Family death				
Yes	1 (50.0)	1 (50.0)	0.243	4.7
No	9 (17.3)	43 (82.7)		
ICU requirement				
Yes	5 (38.4)	8 (61.6)	**0.034**	4.5
No	5 (12.1)	36 (87.9)		
Bleeding history				
Yes	7 (31.8)	15 (68.2)	**0.037**	4.5
No	3 (9.3)	29 (90.7)		
Transfusion requirement				
Yes	7 (33.3)	14 (66.7)	**0.025**	5.0
No	3 (9.1)	30 (90.9)		

PTSD, post-traumatic stress disorder.

Patients requiring a stay at the intensive care unit (ICU), blood transfusions, and patients with bleeding showed significantly higher rates of PTSD diagnosis (Table 1) than the others. HRQL assays of patients and HRQL averages for the Turkish population and control group are shown in Table 2. The patients' scores for social functionality, emotional health, general health, and mental health were significantly lower than those of the Turkish population and control group (Table 2).

DISCUSSION

CCHF is still an important disease causing labor losses and fatalities. Anxiety due to CCHF can be easily observed among people living in endemic regions. In the present study, patients were studied for HRQL and the presence of PTSD after 1 year of CCHF diagnosis. To the best of our knowledge, the present study is the first study that investigates the psychiatric outcomes of CCHF patients.

Among survivors of many life threatening infectious diseases, psychiatric morbidities were observed

Table 2. Comprasion of HRQL assay scores between CCHF patients and the control group

Quality of life	CCHF patients mean (sd)	Control group mean (sd)	Turkey population mean (sd)	$P^{1)}$
Physical functioning	86.4 (15.2)	86.9 (8.4)	86.6 (25.2)	0.791
Role limitations due to physical health	91.2 (21.8)	92.1 (19.3)	89.5 (29.6)	0.936
Bodily pain	87.3 (9.9)	87.9 (10.1)	86.1 (20.6)	0.359
General health	62.0 (5.5)	71.0 (11.3)	73.9 (17.5)	**<0.001**
Vitality	67.7 (13.6)	69.5 (11.4)	67.0 (13.8)	0.823
Social functioning	80.7 (19.8)	94.9 (10.1)	94.8 (14.2)	**<0.001**
Role limitations due to emotional health	57.5 (15.4)	87.7 (16.0)	94.7 (20.9)	**<0.001**
Mental health	66.4 (17.4)	73.7 (11.2)	73.5 (11.6)	**0.021**

1): Comparison between patients and control group.
HRQL, health-related quality of life; CCHF, Crimean-Congo hemorrhagic fever.

(6–9,12). Similar to CCHF, SARS is an infectious disease that has an acute course, but it is not chronic in process. Similarly to CCHF, SARS was epidemic and fatal; it threatened the society. A study carried out with SARS survivors, 30 months after their recovering from the disease, reported that one-third of the patients suffered from some psychiatric disorders and one-fourth had PTSD (7). In another study carried out 1 year after the SARS pandemic, survivors of this infection were reported to have persistently elevated stress and to be psychologically distressed. During the year of the epidemic, stress, anxiety, depression, and post-traumatic stress symptoms were observed among SARS patients (15). Similarly, among patients quarantined for SARS in Toronto, 28.9% had PTSD symptoms, and 31.2% had symptoms of depression. Moreover, quarantine duration was correlated with PTSD symptoms (16). In addition to CCHF and SARS, *Legionella* pneumonia and abdominal sepsis are fatal infectious diseases that have been reported to have psychiatric morbidities (6,12). In a study conducted on legionellosis 17 months after the disease, it was reported that 15% of survivors had PTSD, whereas only one patient sought medical help (6). In another study conducted on abdominal sepsis patients, it was found that 38% had PTSD symptoms and, 10% were diagnosed with PTSD (12). In accordance with the studies above, the current study revealed that among CCHF patients, 48.1% had PTSD symptoms, and 18.5% had PTSD 12 months after discharge. None of these patients had or witnessed any life threatening trauma prior to being diagnosed with PTSD as reported by patients. The symptoms of PTSD started after CCHF, and the symptoms were related to the disease and the hospitalization period in all patients. These factors suggest that PTSD symptoms were more likely to be due to CCHF. Interestingly, none of the patients sought medical help for their psychiatric problems.

In literature, there are few studies investigating the effects of age and gender on infectious diseases and their psychiatric outcomes. A study conducted on SARS patients reported that women have higher PTSD scores (15). In addition, in a study exploring the relationship between abdominal sepsis and PTSD, young patients were found to have higher risk for developing PTSD (12). In the present study on CCHF patients, PTSD was not found to be correlated with gender and age. The reason for this result may be the unequal distribution of the sample regarding gender (women, 20.4%). More men than women had CCHF as they generally work in open fields. Moreover, patients in this study were mostly middle aged.

When the effects of an ICU stay and/or duration of hospitalization in patients with *Legionella* pneumonia and abdominal sepsis patients with PTSD were considered, these were both regarded as significant risk factors for developing PTSD (6,12). In the current study, ICU stay, bleeding, and requirement of transfusion were found to be related with higher risk of developing PTSD.

The relevant literature presents impaired HRQL dimensions in both infectious and chronic diseases. For example, in a study conducted on *Legionella* pneumonia survivors, it was found that, 17 months after the disease, most of the patients had lower HRQL. In these patients, 7 out of 8 dimensions of HRQL were impaired (6). Similarly, among left-sided native valve endocarditis survivors, 5 out of 8 dimensions of HRQL were impaired after 1 year from discharge. In particular, in patients who were over 60 years of age, 2 dimensions of HRQL were significantly impaired (general health and physical functioning) (10). In the current study, the following 4 out of 8 dimensions of HRQL were impaired: general health, emotional health, mental health, and social functioning. Physical health dimensions were intact but mental dimensions were disturbed. This may be explained by the non-chronic nature of CCHF. Full physical recovery was observed in a month from illness; however, psychological effects of the disease were more resilient.

It is most likely that some of the patients who had PTSD may have an increased alcohol and controlled substance use. Studies from the Asian region did not show such an increase, but these results may be explained by alcohol intolerance in the region (7). In our study, alcohol and substance use were not affected. We attribute this to the religious and cultural characteristics of the region.

Each patient was evaluated by a psychiatrist, who is the only psychiatrist in our clinic and city. The diagnosis was established by using the DSM-IV-TR criteria. The presence of a second psychiatrist might have improved the validity of our results. In addition, among our target patients we could not include 51 patients; 30 patients could not be reached as they mostly resided in rural areas without any telephone or cell phones, and 21 patients refused to participate in the study because of

sociocultural and private reasons. The aforementioned facts are the main limitations of this study.

Patients diagnosed with CCHF were not followed up in the long term because relapse and recurrence were not expected. CCHF patients may develop PTSD as CCHF is a potentially fatal disease, and CCHF patients may require ICU stay and blood transfusions. Moreover, we believe that CCHF patients, especially those who stayed in the ICU, who required blood transfusions, and/or who had bleeding should be psychiatrically monitored in the long run and given medical support, if required.

Conflict of interest None to declare.

REFERENCES

1. American Psychiatric Association (2000): Diagnostic and Statistical Manual of Mental Disorders (revised 4th ed., text revision). Washington, DC.
2. Whitehouse, C.A. (2004): Crimean-Congo hemorrhagic fever. Antiviral Res., 64, 145–160.
3. T.C. Sağlık Bakanlığı: Kırım Kongo Kanamalı ateşi: 2002–2009 yılları vaka sayıları. Online at 〈http://www.saglik.gov.tr/KKKA/dosya/1-69298/h/2002-2009.pdf〉 (in Turkish). Accessed 22 January 2011.
4. Ergönül, O. (2006): Crimean-Congo haemorrhagic fever. Lancet Infect. Dis., 6, 203–214.
5. Marty, A.M., Jahrling, P.B. and Geisbert, T.W. (2006): Viral hemorrhagic fevers. Clin. Lab. Med., 26, 345–386.
6. Lettinga, K.D., Verbon, A., Nieuwkerk, P.T., et al. (2002): Health-related quality of life and posttraumatic stress disorder among survivors of an outbreak of Legionnaires disease. Clin. Infect. Dis., 35, 11–17.
7. Mak, I.W., Chu, C.M., Pan, P.C., et al. (2009): Long-term psychiatric morbidities among SARS survivors. Gen. Hosp. Psychiatry, 31, 318–326.
8. Lancee, W.J., Maunder, R.G., Goldbloom, D.S., et al. (2008): Prevalence of psychiatric disorders among Toronto hospital workers one to two years after the SARS outbreak. Psychiatr. Serv., 59, 91–95.
9. Garralda, M.E., Gledhill, J., Nadel, S., et al. (2009): Longer-term psychiatric adjustment of children and parents after meningococcal disease. Pediatr. Crit. Care Med., 10, 675–680.
10. Verhagen, D.W, Hermanides, J., Korevaar, J.C., et al. (2009): Health-related quality of life and posttraumatic stress disorder among survivors of left-sided native valve endocarditis. Clin. Infect. Dis., 48, 1559–1565.
11. Cohen, B.E., Marmar, C.R., Neylan, T.C., et al. (2009): Posttraumatic stress disorder and health-related quality of life in patients with coronary heart disease: findings from the Heart and Soul Study. Arch. Gen. Psychiatry, 66, 1214–1220.
12. Boer, K.R., van Ruler, O., van Emmerik, A.A., et al. (2008): Factors associated with posttraumatic stress symptoms in a prospective cohort of patients after abdominal sepsis: a nomogram. Intensive Care Med., 34, 664–674.
13. Ware, J.E. and Grandek, B. (1998): Overview of the SF-36 Health Survey and the International Quality of Life Assessment (IQOLA) Project. J. Clin. Epidemiol., 51, 903–912.
14. Koçyiğit, H., Aydemir, Ö., Ölmez, N., et al. (1999): Kısa Form-36 (KF-36)'nın Türkçe versiyonunun güvenirliği ve geçerliliği. İlaç. Ve. Tedavi. Dergisi., 12, 102–106 (in Turkish).
15. Lee, A.M., Wong, J.G., McAlonan, G.M., et al. (2007): Stress and psychological distress among SARS survivors 1 year after the outbreak. Can. J. Psychiatry, 52, 233–240.
16. Hawryluck, L., Gold, W.L., Robinson, S., et al. (2004): SARS control and psychological effects of quarantine, Toronto, Canada. Emerg. Infect. Dis., 10, 1206–1212.