Erciyes Med J 2019; 41(1): 105–7 • DOI: 10.14744/etd.2018.18186

Clinical Outcome of Leptospirosis: A Fatal Case Report

CASE REPORT

Kate Nikolaevna Bukharina, Gulnar Nuralinova, Saule Maukayeva

ABSTRACT

Leptospirosis is a widespread zoonotic disease that is commonly seen in temperate and tropical areas. Here, we have presented a case report of fatal leptospirosis with thrombocytopenia and renal failure. A 22-year-old male soldier was referred to the infectious diseases clinic with complaints of fever, headache, dizziness, sore throat, and weakness. He had a history of staying in a village and tick removal from his head. An extended polymorphic rash on the whole body, congestion on the sclera, hyperemic pharynx, and hepatomegaly were observed. Laboratory examination revealed leukocytosis and impaired liver and kidney function tests. Antibiotic therapy with penicillin G and gentamicin was started with the pre-diagnosis of leptospirosis. The main diagnosis was confirmed by passive hemagglutination test positivity. On day 5 of treatment, bleeding continued, and hemodialysis was performed. The patient died on day 6 of treatment. The physicians should be aware about the clinical presentations of Leptospira infections in endemic areas.

Keywords: Leptospirosis, leptospira, outcome

Cite this article as: Nikolaevna Bukharina K, Nuralinova G, Maukayeva S. Clinical Outcome of Leptospirosis: A Fatal Case Report. Erciyes Med J 2019; 41(1): 105-7.

Department of Infectious Diseases, Semey Kalasy Memlekettik Meditsina University Ringgold Standard Institution, Semey, Kazakhstan

Submitted 21.11.2018

Accepted 24.11.2018

Available Online Date 08.01.2019

Correspondence Kate Nikolaevna Bukharina, Department of Infectious Diseases, Semey Kalasy Memlekettik Meditsina University Ringgold Standard Institution, Semey, Kazakhstan
Phone: +77766130488
e.mail: bukharina_en@mail.ru

INTRODUCTION

Leptospirosis is a widespread and prevalent zoonotic disease caused by pathogenic spirochetes of the genus Leptospira. It is common in both temperate and tropical areas (1). The common cause of human infection is direct or indirect exposure to urine from infected reservoir host animals that carry the pathogen in their renal tubules and shed pathogenic leptospirosis that contaminates soils, streams, surface waters, and rivers (2). Humans may be infected by mucous membranes and abrasions on the skin (1). The various fauna of East Kazakhstan is the favorable environmental source of infectious agents of natural focal infections, including leptospirosis. The incidence of these diseases among the population is caused by epizooty among rodents (3). According to the monitoring of leptospirosis, an increase of its incidence is often observed in the winter and in the spring due to the rise of the biological activity of rodents. An average of 12–20 people annually get sick in the East Kazakhstan region (3). In the Semey region, Leptospira infection in humans has not been registered for the last 15 years. However, one case appeared in Semey in 2012. Here, we have presented a case with complicated organ failure and fatal outcome.

CASE REPORT

A 22-year-old male soldier was admitted to the infectious diseases clinic with complaints of fever (39°C), headache, dizziness, sore throat, weakness, eruption all over the body, and pain in the calf muscles of the legs for 6 days. The patient had been hospitalized 3 days ago in the military hospital, and a combination of antibiotic therapy was initiated (ceftriaxone 2x2 g intravenously in 1 day and oral amoxicillin–clavulanate 3x1 g in 1 day) by the diagnosis of community-acquired pneumonia and cholecystitis. On chest X-ray, pulmonary image was strengthened on all fields, roots of the lungs were expanded, deformed, and heavy mainly on the right, and sinuses were free on admission. The patient was referred to our clinic because of a decrease in urine output and inadequate response to antibiotic treatment. He had a history of viral hepatitis 3 years ago. Before the start of his complaints, he had stayed in a village 40 km from the city for 15 days. He gave a history of tick removal from his head 3 days before the beginning of his complaints.

On admission, the patient's vital signs were normal. An extended polymorphic rash all over the body was observed. Congestion and redness were present in the sclera. In the field of the pillar part of the head, primary affect as infiltrate was seen. The muscles of the body were morbid with palpation. The pharynx was hyperemic. Hepatomegaly was observed with abdominal palpation. Laboratory examination revealed leukocytosis and impaired liver and kidney function tests (Table 1). Urinalysis revealed proteinuria and pyuria, no bilirubinuria, and hematuria. An acute onset of symptoms, toxemia, myalgia, polymorphic exanthema with hemorrhagic compo-

Table 1. A summary of the laboratory test results of the case according to hospital days

Laboratory test	Hospital days						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
WBC (x10^9/l)	4.2		11900	11900	16900		14200
Hemoglobin (g/dl)	15		12.2	11.9	8.1		7
Thrombocytes (x10^9/l)	250			12	10		100
ESR (mm/h)	18		2	5	34		35
ALT (mmol/l)		1.64	1.08	0.61	0.168		
AST (mmol/l)		1,4		0.63			
Tbil (µmol/l)		97.2	124	57	45		27
Dbil (µmol/l)		54	82	36			19
Protein (g/l)		64	55	54	67		61
BUN (mmol/l)		16.5	27.7	25	37.8		36
Creatinine (µmol/l)		13.6	5.6	5.1	6.4		6.2
TT (30–40 s)						54	300
APTT (30–40 s)				55	39.3	43.9	62.8
INR (1.1)		2.2	1.26	1.12		1.59	
Fibrinogen (g/l)				1.93	2.66	2.18	

WBC: White blood cell; ESR: Erythrocyte sedimentation rate; ALT: Alanine aminotransferase; AST: Aspartate aminotransferase; Tbil: Total bilirubin; Dbil: Direct bilirubin; BUN: Blood urea nitrogen; TT: Thromboplastin time; APTT: Activated partial thromboplastin time; INR: International normalized ratio

nent, and dysfunctions in the liver, kidneys, and central nervous system (CNS) supported a clinical diagnosis of leptospirosis with icteric and severe forms. Antibiotic therapy with penicillin G 2 million units six times a day intravenously and gentamicin 0.08 g three times a day intramuscularly was started.

On day 2 of treatment, agitation, visual hallucinations, jaundice, and hepatomegaly increased, and urine output decreased. On the same day, the patient had sudden onset hematemesis. The patient was transported to the intensive care unit on day 3 of treatment. The diagnosis of leptospirosis was confirmed by passive hemagglutination test (the titer was 1/160). Leptospira was also seen in peripheral blood smear. An analysis of the cerebrospinal fluid (CSF) revealed the following: color—yellow, transparency—unclear, cytosis—23, neutrophil—4, lymphocytes—19, protein—0.33 g/l, and glucose—3.5 mmol/l. Microscopic examination and culture of the CSF were negative. Daily fluid electrolyte and blood product follow-up was performed with the diagnosis of disseminated intravascular coagulation and hepatorenal insufficiency. On day 5 of treatment, bleeding continued, and hemodialysis was performed. The patient died on day 6 of treatment despite intensive therapy.

DISCUSSION

Leptospirosis is a zoonotic disease that shows a wide variety of clinical manifestations. The incidence in tropical regions is nearly 10 times higher than that in temperate regions (4). Human infection occurs after exposure to environmental sources, such as animal urine, contaminated water or soil, or infected animal tissue. Risk factors for infection include occupational exposure (farmers, rice farmers, veterinarians, abattoir workers, ranchers, trappers, loggers, sewer workers, pet traders, military personnel, and laboratory workers), household exposure, outdoor activities, and laboratory accidents (5). The patient had also a history of being in an endemic area and tick attachment. He was also in military service training in the field.

Conjunctival erythema is an important and frequent sign of the infection. Hemorrhagic diathesis is also a common finding due to thrombocytopenia (6). In a 6-year case series of 182 patients, conjunctival suffusion had been observed in 55% of the patients (7). The presented patient had a history of acalculous cholecystitis by abdominal ultrasonography in the military hospital. Acalculous cholecystitis is an under-recognized presentation of acute leptospirosis. In the literature, many cases had experienced cholecystectomy with antibiotic treatment in the therapy (8).

On CSF examination, the patient had lymphocytic pleocytosis. Aseptic meningitis is observed in 50%–85% of the patients if the CSF is examined after 7 days of illness. Generally, this finding has been associated with a host immune response to the organism rather than to direct infection (6). However, Romero et al. (9) have reported a 59% polymerase chain reaction positivity in the CSF examination of 39 patients with leptospirosis with meningeal signs.

In hospitalized patients, mortality rates range from 4% to 52% (6). One retrospective review of 282 cases reported that the significant predictors of death include CNS and pulmonary involvement (10). In another review of 35 studies, high case fatality rates were associated with jaundice, renal failure, and age >60 years (11). This patient had a poor prognosis criterion that included the severe presentation of infection, jaundice, renal failure, and central involvement. The outcome of the patient resulted in death despite adequate antibiotic treatment and intensive care support.

CONCLUSIONS

The clinical presentation of Leptospira infection varies from asymptomatic to the severe and fatal form as seen in this case. The physicians should be aware about the clinical presentations of Leptospira infections in endemic areas.

Informed Consent: Written informed consent was obtained from the patient's mother.

Peer-review: Externally peer-reviewed.

Author Contributions: Designed the study: SM. Collected the data: GN. Analyzed the data: KNB. Wrote the paper: SM. All authors have read and approved the final manuscript.

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

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

REFERENCES

1. Day NPJ. Leptospirosis. In: Cohen J, Powderly WG, Opal SM, editors. Infectious Diseases. China: Elsevier; 2017. p. 1103–4. [CrossRef]
2. Bedel C, Ararat E. Anicteric Leptospirosis: A frequently forgotten disease. Erciyes Med J 2018; 40(3): 166–8. [CrossRef]
3. Boyubosinov EU, Kusainov AZH, Maksutova G. Sepizootic and epidemic situation by leptosipirosa in the Republic of Kazakhstan. J Infectology 2015; 7(2): 30–3.
4. Hartskeerl RA, Collares-Pereira M, Ellis WA. Emergence, control and re-emerging leptospirosis: dynamics of infection in the changing world. Clin Microbiol Infect 2011; 17(4): 494–501. [CrossRef]
5. Lupi O, Netto MA, Avelar K, Romero C, Bruniera R, Brasil P. Cluster of leptospirosis cases among military personnel in Rio de Janeiro, Brazil. Int J Infect Dis 2013; 17(2): e129–31. [CrossRef]
6. Day N. Leptospirosis: Epidemiology, microbiology, clinical manifestations, and diagnosis. Available at: https://www.uptodate.com/contents/leptospirosis-epidemiology- microbiology-clinical-manifestations-and-diagnosis?source=history_widget. Accessed February 6, 2019.
7. Vanasco NB, Schmeling MF, Lottersberger J, Costa F, Ko AI, Tarabla HD. Clinical characteristics and risk factors of human leptospirosis in Argentina (1999-2005). Acta Trop 2008; 107(3): 255–8.
8. Davies P, Aoyagi Y. Leptospirosis presenting as acute acalculous cholecystitis. Clin Case Rep 2017; 5(11): 1775–9. [CrossRef]
9. Romero EC, Blanco RM, Yasuda PH. Aseptic meningitis caused by Leptospira spp diagnosed by polymerase chain reaction. Mem Inst Oswaldo Cruz 2010; 105(8): 988–92. [CrossRef]
10. Pappachan MJ, Mathew S, Aravindan KP, Khader A, Bharghavan PV, Karreem MM, et al. Risk factors for mortality in patients with leptospirosis during an epidemic in northern Kerala. Natl Med J India 2004; 17(5): 240–2.
11. Taylor AJ, Paris DH, Newton PN. A Systematic Review of the Mortality from Untreated Leptospirosis. PLoS Negl Trop Dis 2015; 9(6): e0003866. [CrossRef]