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Case Report

Severe Leptospirosis (Weil's Disease) with Multiple Organ Failure in Urban Setting: A Case Report

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ABSTRACT

Leptospirosis is a rare disease that could cause multiple organ failures and death if left untreated. The correct treatment will determine the recovery of patients. A 28-years old male came to the Emergency Department with profuse diarrhea. No prior medical history; worked as a private employee recently assigned to collect rat traps one week before. Laboratories show severe thrombocytopenia, acute liver failure, and acute renal failure support by imaging with the conclusion of hepatomegaly with normal kidney size. During observation in the emergency room, the patient worsens into septic shock. The patient was treated in intensive care, diagnosed with Weil's disease, and treated given antibiotics with aggressive fluid therapy; dialysis was postponed, and close monitoring of the patient's symptoms and organ function. After five days of care, clinical symptoms and organ function improved, and the patient was discharged well. Diagnosis of Leptospirosis is challenging with a combination of signs and symptoms that are not commonly found. Therefore, primary treatment is antibiotic and supportive care such as renal replacement therapy is not routinely needed as long there are improvements in close monitoring. This objective is to increase awareness and treatment option for further severe leptospirosis cases

Keywords: dialysis; fluid therapy; leptospirosis, multi organ failure; Weil's Disease

Highlights: . Novelty in this case is Weil's Disease could manifest as severe acute kidney injury without prominent icteric whilst hepatomegaly with increase liver function occur will be reversable with appropriate conservative management. It benefits as reference to postpone dialysis with proper conservative management.

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INTRODUCTION

Leptospirosis is a zoonotic infection that affects both humans and animals.[1]According to WHO, in 2019, there were 920 cases reported in Indonesia, with 122 deaths. However, this reported case number is a severe underestimate of leptospirosis occurrence in Indonesia, given that the annual morbidity of leptospirosis in the population was recently estimated at 39.2 per 100,000 people.[2]Clinical symptoms are undistinguishable from other infectious diseases such as hepatitis, dengue, and typhoid. Severe cases, rather known as Weil's Syndrome, are the triad of haemorrhage, jaundice, and acute kidney injury.[3]The primary treatment for leptospirosis is antibiotic such as penicillin and supportive care. Hemodialysis as the early supportive therapy for kidney injury did not associate with the mortality rate in a critically ill patient.[4] The objective of this report is to increase awareness and as the reference consideration to treat severe leptospirosis in further cases.

CASE REPORT

A 28th-year-old man from Kemayoran, Central Jakarta, was admitted to the Emergency Department with profuse diarrhoea, nausea, yellowish-red sclera, malaise, and muscle pain, especially below the knee. The stool is brown-yellow with soft consistency without blood; meanwhile, the urine is dark. Symptoms occur around two days before admission with a fever that has never been felt before. There is no prior medical history or high-risk lifestyles such as needle injection and promiscuity. Patient work as a private employee. One week before admission, he was assigned to collect rat traps around the corner of a warehouse. He did not catch a single rat and managed to clear up the trap. No evidence of rat bite or prior flood was recorded during that time.

Physical examination on admission shows vital signs of low blood pressure (109/75 mmHg), regular pulse, breath and no fever (36.5°C). Conjunctival suffusion, normal breath and heart sound, abdominal pain at the epigastric, and no swelling nor jaundice on the extremities. The patient was suspected of having a Hepatitis A infection.

Laboratories and imaging did the further investigation. Laboratory finding shows anaemia, leucocytosis, thrombocytopenia, hyponatremia, increased bilirubin level, slight hypo albumin, normal blood coagulation test, liver injury and renal failure—serologic tests of anti-HAV, HBsAg, anti-HCV, and anti-HIV show negative results (Table 1). Chest x-ray (Figure 1) was clear, and abdominal ultrasonography (Figure 2) shows non-specific hepatomegaly without other organs abnormality. By the time examination was done, blood pressure had dropped to 85/34 mmHg, pulse rate 102 times per minute, respiratory rate 25 times per minute, with a normal temperature of 38.2°C, fall into the diagnosis of septic shock then given norepinephrine 0,1 mcg per bodyweight per minute. Transfusion of one unit thrombocyte concentrate followed by hydration of NaCl 3% 500 ml with crystalloid 2000 ml over 24 hours, antibiotic, proton-pump inhibitor (PPI) and attapulgite was given as initial therapy. The patient was admitted to the ICU for further monitoring.

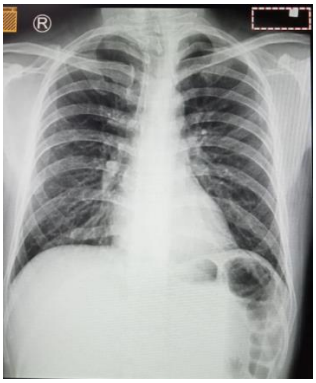

Figure 1. Chest X-Ray, Shows No Abnormality in Lungs and Heart

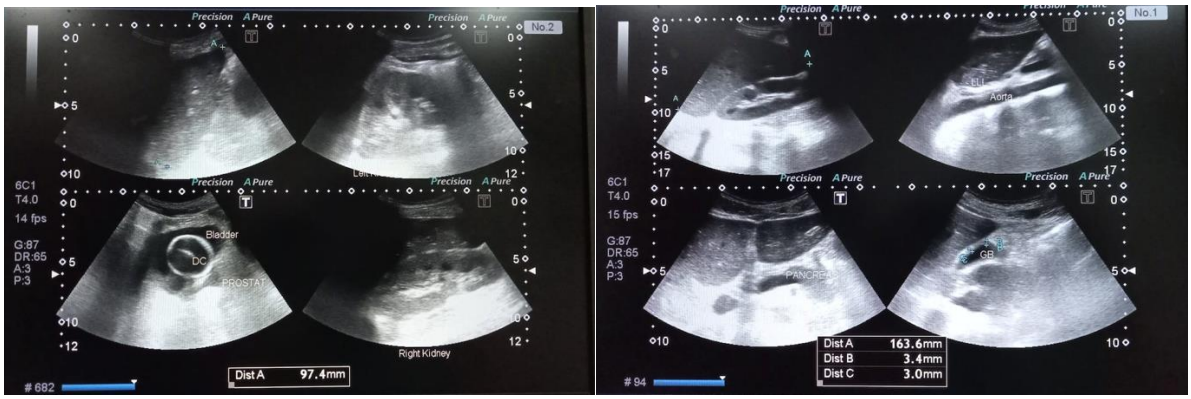

Figure 2. Abdominal Ultrasonography, Shows A Non-Specific Hepatomegaly with Normal Kidney Structure

During intensive care, the patient clinical was improved with normal vital signs, decreasing icteric, and no other symptoms. Follow-up laboratory findings were done with anaemic, improving leucocytes, thrombocytes, and liver and renal function. Norepinephrine support was tapered down, and the patient planned to move to the general wards. Additional test IgM anti-leptospirosis was done and shows a positive result. Treatment of antibiotics, rehydration, and PPI was continued. The patient was hospitalized for another three days. On the last day, the patient clinically improves, and symptoms are all gone but icteric slightly remains. Stool and urine are within normal colours. The patient then discharges with antibiotics and PPI as home medicine.

Table 1. Laboratory Examination

Examination	Result				
	22/8	**23/8**	**24/8**	**25/8**	**26/8**
Hemoglobin (g/dL)	10.3	9.5	9.8	10.1	10.2
Hematocrit (%)	27.8	25.3	27.0	27.8	28.1
Leucocyte (/uL)	20,400	27,680	12,600	6,080	5,950
Thrombocyte (/uL)	36,000	71,000	91,000	119000	163,000
Natrium (mmol/L)	126.0	-	-	-	-
Kalium (mmol/L)	3.67	-	-	-	-
Chloride (mmol/L)	95.5	-	-	-	-
ALT (g/dL)	79.7	-	-	-	-
AST (g/dL)	170.4	-	-	-	-
Albumin (mg/dL)	2.8	-	-	-	-
Creatine (mg/dL)	11.45	8.76	-	-	2.29
Urea (mg/dL)	236.1	283.1	-	-	145.7
eGFR (mL/min/1.73m^2)	6	8	-	-	39
Anti HAV	Non-reactive	-	-	-	-
HBsAg	Non-reactive	-	-	-	-
Anti HCV	Non-reactive	-	-	-	-
Anti HIV	Non-reactive	-	-	-	-
Total Bilirubin (mg/dL)	8.0	-	-	-	5.05
Conjugated Bilirubin (mg/dL)	6.45	-	-	-	3.93
Unconjugated Bilirubin (mg/dL)	1.55	-	-	-	1.12
PT (second)	17.8	-	-	-	-
Control PT	14	-	-	-	-
APTT (second)	31.4	-	-	-	-
Control APTT	31.3	-	-	-	-
IgM Anti-Leptospira	-	-	-	-	Reactive

Abbreviations: g = grams; dL = deciliter; uL = microliter; mm = millimeter; U = unit; L = liter; mEq = milliequivalent, min = minutes

DISCUSSION

In this report, we have described a case of severe leptospirosis or known as Weil's Disease.[1,3] On admission, the patient presented with fever, conjunctiva suffusion, dark urine, and myalgia with leucocytosis, thrombocytopenia, AKI, liver failure, and hyperbilirubinemia. Patients experience septic shock in the ER and are given norepinephrine as support. Treatment given was antibiotics and aggressive hydration. Dialysis was postponed while watchful waiting for the improvement of kidney functions by fluid therapy. Strict monitoring of kidney function and haematology was done. Symptoms and kidney function then recover with the treatment given.

Leptospira is a zoonotic disease that is an emerging global public health problem. Indonesia, with a high incidence of flooding and subsequent presence of stagnant water and poor sanitation conditions in some housing areas, is at high risk for leptospirosis. The transmission from infected animals through their urine (rodents, dogs, livestock, pigs, horses, wildlife) can survive for weeks to months in water and soil. A human can be infected through direct contact with the urine, urine-contaminated water, and wet soil, or ingestion of urine-contaminated food or water.[1,5,6] In the present case, there is no contact with water or soil, but our patient does risk contact with a rat trap which could be contaminated with rodent urine. High-risk infection activities include wading, swimming, boating, and activities that could lead to skin abrasion and water or soil exposure.

Leptospirosis symptoms are usually a flu-like illness of sudden onset, fever, headache, nausea, vomiting, abdominal pain, conjunctival suffusion, and myalgia, typically on the calves and lower back. Severe cases have a classic presentation known as Weil's syndrome consists of the triad of haemorrhage, jaundice, and AKI.[1,3,5] Incidence of severe leptopirosis estimated 5% to 15% of patients.[7]Symptoms that occur in our patients fulfil the severe symptoms. Thrombocytopenia is common in leptospirosis, which suggested a mechanism caused by peripheral platelet consumption due to widespread haemorrhages, immune-mediated platelet destruction caused by antiplatelet antibodies, and inhibited platelet production by bone marrow.[8] It aggravates hemorrhagic manifestation, as does installation access for dialysis if needed. Therefore, transfusion of thrombocyte concentrate was given as a preventative strategy.[9]Septic shock occurs because of severe infection from leptospira which causes vasculitis and systemic inflammatory response syndrome.[10] It could develop into an immunosuppressive state as it evolves until the death of the host.[11] Early administration of the vasoactive drug norepinephrine is beneficial in restoring organ perfusion in septic shock patients.[12]

Treatment of leptospirosis consists of antibiotics and supportive therapy. Antibiotics chosen are penicillin group or cephalosporin such as ceftriaxone that was given to our patient. Leptospira are highly susceptible to a broad range of antibiotics. A Jarisch-Herxheimer reaction may occur as a response to the clearance of spirochetes from the circulation. It is an acute inflammatory response characterized by fever, rigors, and hypotension with a 21% incidence according to Guerrier et al which is not found in this report.[13,14] Supportive therapies are based on clinical manifestation with renal replacement therapy, ventilatory support, and blood products. A study in Brazil shows that leptospirosis patients with complications of acute respiratory distress syndrome and AKI benefit from daily hemodialysis to lower the mortality rate.[15] While the STARRT-AKI (Standard versus Accelerated Initiation of Renal-Replacement Therapy in Acute Kidney Injury) investigation concluded that among critically ill patients with AKI, an accelerated renal-replacement strategy within 12 hours was not associated with a lower risk of death than the standard strategy.[4] This study supports the present case in which dialysis, as renal replacement therapy, was not given to the patient and, as a result of clinical laboratories, does improve with aggressive

fluid therapy alone. The choice made was risky yet convenient and promising as for the patient condition and psychology that he did not need dialysis.

STRENGTHS AND LIMITATIONS

The strength of this study were the detail information given from patient history prior medication to condition and treatment given until discharge. The limitation of this study were treatment decision are based on physician experience and patient profile therefore not always applicable in every cases.

CONCLUSIONS

Overall, diagnosis and treatment of leptospirosis are challenging. Typical infection symptoms of fever, when followed by icteric, hemorrhagic, and AKI, should be asked for further anamnesis of contact with rodent or other leptospirosis risks to ensure the diagnosis. Treatment given for leptospirosis is mainly antibiotics and close monitoring. In contrast, other supportive care, such as renal replacement therapy, is not routinely needed because renal failure will recover itself as the infection diminishes.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in this report.

AUTHOR CONTRIBUTION

Conceptualization and supervision: SH. Data curation, writing-original draft, review, and editing: BAH.

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