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A Case of Hemorrhagic Leptospirosis with Multiple Organ Dysfunction Syndrome

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Abstract

The male patient was 51 years old. He was admitted to hospital on March 29, 2019, due to "fever, cough, jaundice and 5 days of poor appetite". He developed a fever (no body temperature) at 5 days prior to the absence of an obvious cause, no chills, with slight cough, a little white sticky sputum, no blood in the sputum, no rust colored sputum, no chest pain, no nasal congestion or runny nose, no sore throat and had been treated at the local hospital and intends to be diagnosed as "upper respiratory infection".

Keywords: Nasal congestion • Renal function • Type 1 diabetes mellitus • Meta-analysis

Introduction

He received anti-virus and anti-infection treatment, but his symptoms did not improve significantly and gradually the sclera and skin yellow staining of the whole body appeared, with limbs weakness, poor appetite, cold sweat, still feel feverish, accompanied by shortness of breath, abdominal pain, diarrhea twice, yellow thin stool, no nausea or vomiting, no abdominal distension, no frequent urination urgency urinary pain, mental fatigue and urinate normally. And then he went to our hospital for treatment and the emergency blood routine showed: WBC 8.07 × 10^9/L, hemoglobin 129.0 g/L, PLT 17.0 × 10^9/L, K 2.96 mmol/L, QHCV-Ab 1.11; chest CT of the outside hospital showed: double pneumonia. He was diagnosed as "double pneumonia virus myocarditis to be discharged" in the emergency department [1].

Case Presentation

Past medical history

He is physically healthy, with a hobby of field swimming for a long time before the onset of illness and had skin damage during swimming recently.

Physical examination: Body temperature: 36.8°C, pulse 63 beats/min, respiration 24 beats/min, blood pressure 112/80 mmHg; clear in consciousness, acute face, severe yellow staining of skin, mucosa and sclera all over the body, small superficial lymph nodes all over the body, no congestive edema in conjunctiva, no cyanosis in lips, congestion in pharynx, bilateral tonsils not large, no abscess points; regular respiratory rhythm, double lung percussion presents clear sound and the double lung respiratory sound is thick and a little wet rales in double lower lungs; heart rate 63 beats/min, with irregular rhythm and no murmur was heard in the auscultation area of each valve. Abdominal soft, mild tenderness under xiphoid process, no rebound pain, liver and spleen under the ribs, MURPHY's sign (-), no percussion pain in liver and kidney areas, bowel sound normal, gastrocnemius tenderness and no abnormalities in other systems (Figure 1) [2-5].

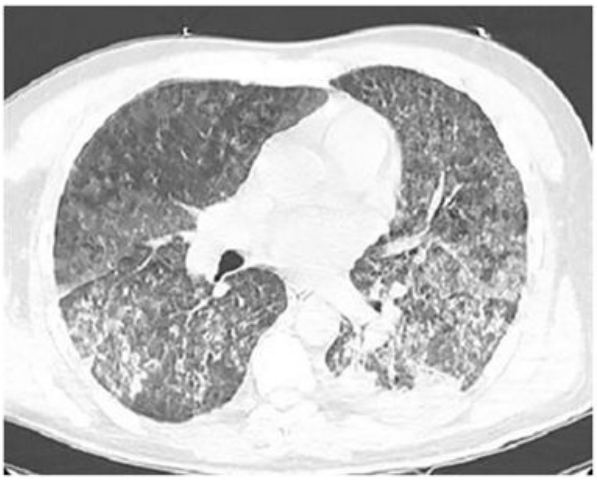

Figure 1. Leptospirosis with multi-organ failure complicated by massive upper gastrointestinal bleeding in a non-epidemic setting with successful management.

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Laboratory examination after admission

Blood cell count 6.40 × 10^9/L, absolute value of neutrophil 4.65 × 10^9/L, Hb 127.0g /L, hematocrit 36.5%, platelet 41.0 × 10^9/L, plasma D dimer 1290.0 ng/ml, procalcitonin 2.05 ng/ml, brain natriuretic peptide 130.19 pg/mL, albumin 31.5 g/L, ALT 41 U/L, AST 91.0 U/L, GGT 93.0 U/L, TBIL 127.8 umol/L, DBIL 93.2 umol/L, IBIL 34.6 umol/L, total bile acid 40.8 umol/L, cholinesterase 4216 U/L, lactate dehydrogenase 308.0 U/L, phosphocreatine kinase 963 U/L, phosphocreatine kinase isoenzyme 32.0 U/L, myoglobin 473.79 ug/L, K 2.96 mmol/L, Na 129.9 mmol/L, Cl 97.3 mmol/L, Ca 1.84 mmol/L, Mg 1.15 mmol/L, urea 9.74 mmol/L, creatinine 132.0 μmol/L, triglyceride 2.98 mmol/L, apolipoprotein A1 0.35 g/L, apolipoprotein B 1.16 g/L, lipoprotein a 45.0 mg/dL, hypersensitive c-reactive protein hCRP 159.08 mg/L, serum amylase 224.0 U/L, lipase 535U/L; hepatitis antigen antibody A+D+E, hepatitis B, C were all negative; blood gas analysis, MP, influenza antigen (AB), dengue virus, epidemic hemorrhagic fever antibody, blood cell cluster differentiation antigen detection also no obvious abnormalities. Full abdominal CT enhancement: Calcification in S5 segment of liver; multiple small cysts in the liver [6].

Chest CT plain scan:

- Double lung infection, a few fibrous lesions in the lower lobe of both lungs.
- The heart is enlarged, with the right atrium and left ventricle. Please combine them clinically.
- Aorta and coronary atherosclerosis.
- A small amount of hydrothorax on both sides of the chest.

Skull CT plain scan showed no obvious abnormalities. Color doppler echocardiography: Ascending aortic sclerosis, senile degeneration changes: Mild regurgitation of the aortic valve, mild regurgitation of the mitral valve, enlargement of atria and right ventricle, left ventricular filling function weakened, pulmonary hypertension (mild).

Admission diagnosis:

- Severe pneumonia.
- Multiple Organ Dysfunction (blood, liver, kidney) Syndroms (MODS).
- Viral myocarditis not excluded.

He was given ceftriaxone for anti-infection, liver and kidney protection, myocardial nutrition, prevention of bleeding, supplementation of platelet and other symptomatic treatment. On the second day of admission, the patient gradually became worse in consciousness, somnolent, unable to answer questions, no complaints of headache and then he was given a complete lumbar puncture examination and a high throughput gene test of pathogenic microorganisms sent by cerebrospinal fluid and blood. CRRT and plasmapheresis were given, moxifloxacin was switched to fight infection and gamma globulin and thymalfasin were added. Cerebrospinal Fluid routine (CSF) was colorless and transparent, negative for Pandy test, WBC-BF 0.0510 × 10^9, RBC-BF 0.000 × 101^2/L, multinuclear 61%, mononuclear 39%, CSF biochemistry: GLU 4.2 mmol/L, K 2.69 mmol/L, Cl 117.9 mmol/L, ADA 0 U/L, UPRO 523 mg/L, no bacteria or fungi were found on the CSF smear, no acid fast bacilli and cryptococcal was negative, CSF immunology and virologic CSF mycobacterium tuberculosis nucleic acid amplification were negative, CSF pressure 170 mm of water.

After multi-disciplinary consultation, viral encephalitis and MODS were considered. And after symptomatic treatment, the patient turned clear in consciousness gradually, liver and kidney function, blood routine also gradually improved. The results of CSF high throughput gene test were reported as follows: Leptospirosis infection; his symptoms disappeared after being switched to ceftriaxone therapy for continuous anti-infection, liver protection and other symptomatic treatment. Chest CT reexamination was normal, as well as the CSF high throughput gene test [7].

Results and Discussion

Leptospirosis is a widespread, potentially life threatening zoonotic disease caused by pathogenic leptospira. It is widely distributed, almost all over the world and the epidemic in tropical and subtropical areas is more serious. It is common in the southwestern and southern provinces of China. Human beings are mainly infected through skin and mucous membrane in contact with the infected water containing leptospira. The intact skin is a strong anti-infection barrier and skin damage is the main route of infection caused by low dose environmental exposure. Men had a nine fold increased risk compared to women, mainly due to occupational reasons [8]. The risk of leptospirosis increases gradually with age, peaking in the 40-49 age groups and then decreasing. In this case, the patient, male, had skin damage and a high risk factor for the onset of exposure to infected water.

The animal host of leptospira is quite extensive, rats and pigs are the two main infectious sources. Rats are the main infectious source of leptospirosis in rice field in Southern China. The main bacterial flora of rats is jaundice hemorrhagic flora, followed by Pomona flora, dogs flora and influenza typhoid type. Jaundice hemorrhagic serotype is also the most common murine serotype reported worldwide. Its clinical course can be variable and sometimes even fatal. The most common symptoms are fever, nausea, poor appetite, fatigue, myalgia, joint pain and abdominal pain. The patient developed fever, digestive tract is normal and rapid progression to multiple organ dysfunction, which was rarely reported clinically [9].

The pathological basis of leptospirosis is toxic damage of systemic capillary infection, which often leads to dysfunction of liver, lung, kidney, brain, heart and so on. The patient had acute fever, multiple organ dysfunctions, decreased platelet and a history of exposure to infected water. Leptospirosis should be highly vigilant and leptospirosis specific serological examination should be performed actively. As the average positive rate of leptospirosis antibody is 28.62%, there is an urgent need for more sensitive detection methods. The macro genome detection of pathogenic microorganisms provides a rapid, accurate and comprehensive detection method, which is the development direction of rapid and accurate diagnosis and treatment of critical and severe infections. The patient was finally diagnosed due to a high throughput test [10].

Conclusion

In addition, the leptospirosis disease is prone to Herxheimer reaction during the treatment of penicillin. An epidemiological investigation on an outbreak of leptospirosis, reported that 6 cases had Herxheimer reaction, accounting for 60%.

The patient in this case, was admitted to hospital for ceftriaxone treatment. After that, his mental state changed and became lethargic, but no meningeal irritation sign was found. After hormone and symptomatic treatment, the symptoms were quickly relieved, which was not consistent with the clinical leptospiral meningoencephalitis type and it was suspected to be Herxheimer reaction, which should also pay close attention to in clinical practice.

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