Multi-organ Failure from Fulminant Leptospirosis: A Case Report

CSIM 2015: Ted Giles Clinical Case Presentation
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Outline

- Case Presentation
- Leptospirosis
- Case Conclusion
- Take Home Points
Presentation

• A 63-year-old male presented to hospital with fever, chills and bilateral proximal leg weakness after a recent trip to Jamaica.

• Physical exam findings were limited to fever, sinus tachycardia and jaundice.
Preliminary Investigations

- Platelets = 33 x 10^9/L, INR = 1.0, creatinine = 410 umol/L
  - Haptoglobin 2.53, LDH and fibrinogen both upper limit of normal
- Total bilirubin = 174 umol/L (direct bilirubin = 136 umol/L), smear = echinocytes, no schistocytes
- CK = 6329 U/L
- LFTs = AST 268 U/L, ALT 229 U/L (ALP and GGT normal)
- Urine microscopy = few granular casts, mild hematuria (5-30 RBC/HPF) but no leukocytes or significant proteinuria.
- Chest X-ray = unremarkable.
- Abdominal U/S = gallbladder sludge without cholelithiasis or biliary ductal dilatation; no hydronephrosis/signs of obstruction were noted.
## Differential Diagnosis

<table>
<thead>
<tr>
<th>Differential</th>
<th>Supporting Diagnosis</th>
<th>Negating Diagnosis</th>
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<tbody>
<tr>
<td>Bacteremia</td>
<td>Fever, AKI</td>
<td>Normal WBC/HR/RR, no source, thrombocytopenia</td>
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<tr>
<td>TTP</td>
<td>Thrombocytopenia, AKI, fever</td>
<td>No hemolysis, no mental status changes</td>
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<tr>
<td>Malaria</td>
<td>Fever, renal/liver dysfunction</td>
<td>Jamaica, neg thick/thin</td>
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<tr>
<td>Leptospirosis</td>
<td>AKI, ↑LFTs, ↑CK, ↓Plts, travel hx</td>
<td>No hemorrhage, no conjunctival suffusion</td>
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<tr>
<td>Viral Hepatitis</td>
<td>↑LFTs, Travel hx</td>
<td>AKI, no other exposures</td>
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<td>Tick-Borne Diseases</td>
<td>Can get ↑LFTs, ↓Plts</td>
<td>Lack of: EM, tick bite, cardiac features, no arthralgias</td>
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Initial Course in Hospital

- Empiric treatment: Aggressive IVF and broad spectrum IV antibiotics
- During hospitalization, his kidney and liver function continued to deteriorate
  - Required hemodialysis.
- Bilirubin 326 umol/L and platelet 16 x 10^9/L.
- Rapid atrial fibrillation with a mild troponin elevation. Echocardiography was normal.
Subsequent Investigations

• Blood and urine cultures negative

• Negative hepatitis serology (A, B, and C), CMV, Parvovirus B19 and EBV serology.

• Bartonella testing inconclusive, borrelia burgdoferi serology negative.

• Presumptive diagnosis – severe leptospirosis (Weil’s disease).
Leptospirosis

• Zoonotic disease
  • Exposure with fresh water or soil exposure
  • Transmission through cuts, abrasions

• Pathogenic spirochetes, family Leptospiraceae, genus Leptospira (22 species)

• Stains poorly, usually require dark field or fluorescent microscopy

• Incubation period 2-26 days
Epidemiology

- Uncommon pathogen in urban North America
- 100 – 200 cases in the US per year
- Incidence 1/100 000 in temperate climates, and 1/10 000 in tropical climates
- Worldwide → Central and South America, central Africa, and Southeast Asia
Clinical Features

- Variable signs/symptoms, usually mild or no clinical features

- Septicemic/Leptospiremic phase
  - Fever/Rigors, Myalgias, HA, **Conjunctival suffusion**

- Immune Phase
  - Phase of organ damage ➔ Renal, pulmonary, hepatic, neurologic, and cardiac
Conjunctival Suffusion
Investigations

- Labs:
  - Hyponatremia, hypokalemia
  - Mild to moderate transaminitis, jaundice
  - Elevated CK
  - Anemia, thrombocytopenia

- Urinalysis → pyuria, granular casts, hematuria

- CSF → Lymphocytic pleocytosis

- CXR → small nodular densities to consolidations/ground glass opacities
Severe Leptospirosis (Weil’s Disease)

- Triad = Jaundice, renal dysfunction, hemorrhagic diathesis
- Rhabdomyolysis
- Hepatic dysfunction
- ARDS/pulmonary hemorrhage
Less Common:

• Myocarditis
• Necrotizing pancreatitis
• Cholecystitis
• Skeletal muscle involvement
• Aseptic meningitis
• Hemolysis, TTP, HUS
Diagnosis and Follow-Up

- Our patient gradually improved with supportive care and intravenous ceftriaxone, and was stepped down to doxycycline on discharge.

- His post-discharge diagnosis was confirmed with a positive Leptospira IgM (ELISA) and a *Leptospira canicola* titer of 1:200

- In follow up, his acute kidney injury (AKI), thrombocytopenia, hyperbilirubinemia, and transaminitis improved to eventual resolution.
Take Home Points

1. Classic presentation = jaundice/hepatic dysfunction, renal dysfunction, rhabdomyolysis, hemorrhagic diathesis

2. Consider Leptospirosis early in the diagnosis of febrile returning travellers from fresh-water areas

3. Early treatment of fulminant Leptospirosis in the setting of multi-organ failure (Weil’s Disease)
Questions?

Go Jays!!! And thank you for your attention!
References


