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### Swimming Through Lake Placid: A Major Headache

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# Swimming Through Lake Placid: A Major Headache

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## INTRODUCTION

Leptospirosis is caused by *Leptospira* species, a spirochete bacterium that affects animals and humans.

The disease can range from mild flu-like illness to multi-organ failure.

While likely underreported, the incidence according to the World Health Organization can range from 0.1 to 10 per 100,000 depending on climate

Leptospirosis is commonly associated with occupational or recreational exposures

## CASE REPORT

A 43 year-old previously healthy man presented with two weeks of myalgias, fevers, neck pain and throbbing headache.

The patient competed in an Iron Man event in upstate New York one month prior to presentation.

Initial investigation demonstrated a mild anemia, elevated aminotransferases and negative head CT.

Lumbar puncture revealed a cerebrospinal fluid (CSF) pleocytosis, normal glucose, mildly elevated protein, and negative gram stain, consistent with aseptic meningitis. The patient was started on acyclovir.

Given his recreational risk factor for Leptospirosis in the setting of characteristic clinical features, we added doxycycline on admission

Acyclovir was discontinued after negative HSV PCR.

Within 24 hours, he improved significantly and was discharged with a course of doxycycline.

Subsequently, all elements of the infectious evaluation returned negative except a positive Leptospirosis Ab. The patient's symptoms and transaminitis fully resolved.



## REFERENCES

Morgan, J., Bornstein, S. L., Karpati, A. M., Bruce, M., Bolin, C. A., Austin, C. C., ... Tappero, J. W. (2002, May 24). Outbreak of Leptospirosis among Triathlon participants and Community Residents in Springfield, Illinois, 1998. *Clinical Infectious Disease*, 34, 1593-1599.

Radl, C., Muller, M., Revilla-Fernandez, S., Karner-Zuser, S., de Martin, A., Schauer, U., ... Allerberger, F. (2011, November 24). Outbreak of Leptospirosis among Triathlon participants in Langau, Austria, 2010. *The Central European Journal of Medicine*, 123, 751-755. doi:10.1007/s00508-011-0100-2

Stern, E. J., Galloway, R., Shadomy, S. V., Wannemuehler, K., Atrubin, D., Blackmore, C., ... Clark, T. A. (2010, February 10). Outbreak of Leptospirosis among Adventure Race Participants in Florida, 2005. *Clinical Infectious Disease*, 50, 843-849. doi:10.1086/650578

United States Centers for Disease Control and Prevention. Leptospirosis. <https://www.cdc.gov/leptospirosis/index.html> (Accessed September 26th, 2019).

United States Centers for Disease Control and Prevention. Leptospirosis Risk in Outdoor Activities. <https://www.cdc.gov/leptospirosis/features/outdoor-activities.html> (Accessed September 26th, 2019).

World Health Organization. Leptospirosis Burden Epidemiology Reference Group (LERG). <https://www.who.int/zoonoses/diseases/lerg/en/> (Accessed on September 26, 2019).

## Laboratory Studies

### Hospital Day 1

LABORATORY STUDIES		
CBC		
WBC		8.7
Hgb		12.3
Platelet		299
CMP		
Na		136
K		3.8
Cr		0.72
Alk Phos		325
Bilirubin		1.4
AST		64
ALT		147

CSF STUDIES	
Pressure	38
Appearance	Colorless
WBC	746
% Lymphocytes	33
% Neutrophils	59
Protein	99
Glucose	54
Gram Stain	4+ WBC, no organisms

Imaging	
CT Head	No acute findings

### Hospital Day 2

LABORATORY STUDIES		
CBC		
WBC		8.0
Hgb		10.9
Platelet		346
Hepatic Function Panel		
Alk Phos		245
Bilirubin		1.1
AST		106
ALT		159

Infectious Disease Work-up	
HSV NAAT	Negative

### Post-discharge Labs

Infectious Disease Work-up	
Enterovirus RNA NAAT	Negative
West Nile IgG	Negative
Anaplasma phagocytophilum	Negative
HIV AG/AB	Negative
Leptospirosis	Positive

Hepatic Function Panel Two Weeks After Discharge	
Alk Phos	100
Bilirubin	0.8
AST	30
ALT	41

## DISCUSSION

Leptospirosis is among the most common zoonotic infections worldwide, however in the United States only about 100-150 cases are reported annually, mostly in Hawaii and Puerto Rico.

The organism infects humans through contact with urine of infected rodents, dogs, and livestock or urine-contaminated environments.

Patient's commonly present with:

- Fevers, myalgias, and headaches after an incubation time of 2 to 26 days
- Other findings can include cough, arthralgias, nausea and vomiting, abdominal pain, and rash
- About 40% of people have elevated aminotransferases, and 50-85% have aseptic meningitis
- Severe cases can progress to jaundice, renal failure, pulmonary hemorrhage, myocarditis, rhabdomyolysis, and ARDS

Leptospirosis is associated with a variety of risk factors, including occupational exposures and recreational activities. Large outbreaks are usually associated with recent rainfall or flooding. The bacteria can invade through skin abrasions and conjunctiva, or by swallowing contaminated water. The relationship between the risk of outdoor water sports and Leptospirosis infection is well described in the literature, with outbreaks around the world, including in Illinois (1998) and Florida (2005). Coincidentally, there had been significant recent rainfall with run-off into Lake Placid, the location of this patient's Iron Man competition.

Our patient's CSF analysis was consistent with aseptic meningitis, but the time course was longer than expected for viral meningitis. Although rare in the United States, clinicians should consider leptospirosis in patients with aseptic meningitis, elevated aminotransferases, and potential exposure history.