

CASE REPORT ΕΝΔΙΑΦΕΡΟΥΣΑ ΠΕΡΙΠΤΩΣΗ

A case of leptospirosis with reversible pancytopenia

Pancytopenia is a very rare manifestation of leptospirosis but it is alarming as it can be accompanied by other potentially fatal complications such as pulmonary hemorrhage, myocarditis and acute respiratory distress syndrome (ARDS). The case is presented of a 37-year-old male with leptospirosis presenting with fever, diarrhea and vomiting, complicated on the second day after admission by pancytopenia. The patient was treated with ceftriaxone and was discharged after 14 days in good clinical condition, with almost complete restoration of hematological and biochemical parameters.

ARCHIVES OF HELLENIC MEDICINE 2016, 33(6):834–836
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2016, 33(6):834–836

A. Aristodimou,¹
C. Bikis,²
N. Spervasilis,²
A. Gikas,¹
D. Kofteridis¹

¹Department of Internal Medicine-
Unit of Infectious Diseases, "PAGNI"
University General Hospital of Heraklion,
Heraklion, Crete

²Department of Internal Medicine,
"PAGNI" University General Hospital of
Heraklion, Heraklion, Crete, Greece

Περίπτωση λεπτοσπείρωσης
με αναστρέψιμη πανκυτταροπενία

Περίληψη στο τέλος του άρθρου

Key words

Leptospirosis
Pancytopenia
Thrombocytopenia

Submitted 29.2.2016
Accepted 8.3.2016

Leptospirosis, a spirochetal zoonotic disease caused by pathogenic *Leptospira* species, can be transmitted to humans mainly by exposure to contaminated water or direct exposure to the urine of infected mammals, predominantly rodents.¹ The clinical spectrum of the disease varies from a self-limited febrile episode to severe illness with multiple organ dysfunction syndrome.² Common clinical findings include fever, jaundice, vomiting, dehydration and diarrhea,³ and more rarely erythroid hypoplasia and or pancytopenia may occur.⁴ This is a report of a case of leptospirosis with pancytopenia as the prevailing manifestation.

CASE PRESENTATION

A 37-year-old man with no significant medical history apart from dyslipidemia was admitted to hospital in Heraklion at the end of June with a 3-day history of fever of up to 40 °C, diarrhea and vomiting. He had a 15 pack-years history of cigarette smoking, reported no recent travel and he worked in a pet shop.

Examination showed a temperature of 40 °C, pulse rate 125/min, respiration 30 breaths/min and blood pressure of 108/68 mmHg. The patient was alert and oriented, but was dehydrated with delayed skin turgor and dry mucous membranes. Abdominal examination revealed tenderness in the right and left lower quadrants. The cardiovascular and respiratory systems were normal.

Laboratory investigation on admission showed: Hct 43.9%, Hb 14.3 g/dL, WBC count $10.3 \times 10^9/L$ with 93.8% neutrophils and mild thrombocytopenia (platelets $119 \times 10^9/L$). Biochemical markers were within the normal range, with the exception of blood levels of sodium (130 mEq/L), potassium (3.3 mEq/L), creatinine kinase (325 IU/L) and troponin I (0.166 ng/mL). Urinalysis revealed protein (4+), hemoglobin (3+), 9 RBCs/HPF, 15 WBCs/HPF and hyaline and granular casts. Blood gases showed mild respiratory alkalosis (pH: 7.44, PO₂: 72 mmHg, PCO₂: 37 mmHg, HCO₃⁻: 21 mmol/L, SO₂: 96%, FiO₂: 21%). The electrocardiograph showed sinus tachycardia and the chest X-ray was normal. Acute gastroenteritis was initially suspected and the patient was commenced on levofloxacin.

The next day conjunctival suffusion was observed and the blood count revealed anemia (Hct 33.9%, Hb 11.3 g/dL), leuco-

penia (WBC count $2.7 \times 10^9/L$) and thrombocytopenia (platelets $46 \times 10^9/L$). The peripheral blood smear showed toxic granulation, a few activated lymphocytes and some large platelets. The direct Coombs test was negative. Because of hypoxemia (PaO_2 : 62 mmHg) and tachycardia (heart rate [HR]: 130/min) the patient was transferred to the intensive care unit (ICU) for better monitoring, where vasopressants were given because of low blood pressure. The hematological parameters continued to deteriorate (Hct 29.9%, WBC count $2.3 \times 10^9/L$, platelets $22 \times 10^9/L$). The liver function tests were: AST 85 IU/L, ALT 47 IU/L, γ GT 93 IU/L, total bilirubin 4.55 mg/dL (direct bilirubin 3.25 mg/dL) and the troponin I level was 1.64 ng/mL. Echocardiography revealed mild diffused contraction disturbance and chest X-ray revealed bilateral pulmonary infiltrates. The diagnosis of acute leptospirosis with cardiovascular, gastrointestinal and hematological manifestations was considered and for which ceftriaxone 2 g/24h was administered intravenously.

Serial cultures of blood, urine and stools were negative and ultrasound of the right abdomen was normal. Investigations for hepatitis B and C, HIV, leishmaniasis, Crimean-Congo virus and West Nile virus were negative. On the fourth hospital day testing for IgM antibodies against *Leptospira* spp was negative, using a commercially available enzyme linked immunoassay (EIA), but 11 days later the test was repeated and IgM antibodies were positive (seroconversion). The patient was discharged after 14 days of hospitalization in good clinical condition and with near complete restoration of hematological and biochemical parameters.

DISCUSSION

Leptospirosis is a widespread and prevalent zoonotic disease which occurs in both temperate and tropical regions.⁵ *Leptospira* spp infect a wide variety of animals, especially rodents and animals associated with farming. Human disease represents only incidental infection (usually work-related contact), acquired through the skin or mucous membranes, typically after exposure to water or soil contaminated with urine from an infected animal.⁴

Leptospiral infection is associated with a very broad spectrum of severity, ranging from subclinical illness to two clinically recognizable syndromes: a self-limited systemic illness and a severe, potentially fatal illness accompanied by various combinations of renal failure, liver failure and pneumonitis with hemorrhagic diathesis.^{6,7} In a retrospective report of 201 patients with leptospirosis, the commonest clinical features included, among others, fever (96.5%), jaundice (94.5%), myalgia (92.5%), headache (74.6%), vomiting (71.6%), dehydration (63.1%), diarrhea (42.3%), tachypnea (32.3%) and conjunctival suffusion (11.9%).³

Although thrombocytopenia can occur (in a series of 79 patients with leptospirosis in Thailand, thrombocytopenia was found in 38% of cases)⁸ along with renal and hepatic involvement,⁴ pancytopenia secondary to leptospirosis has rarely been reported.^{4,9,10} Only Bishara and colleagues reported a high incidence of pancytopenia (28%) among patients in Israel suffering from leptospirosis,¹¹ but other more recent studies do not document such a high incidence.^{12,13}

Thrombocytopenia has been attributed to hemophagocytosis in the bone marrow,¹⁴ platelet consumption due to disseminated intravascular coagulation (DIC), immune mediated platelet destruction and inhibited platelet production in the bone marrow.¹⁵ Leukopenia combined with thrombocytopenia and anemia can be suggestive of bone marrow suppression.^{9,16}

Pancytopenia is associated with a higher incidence of complications, including acute renal failure, jaundice, pulmonary hemorrhage, myocarditis and acute respiratory distress syndrome (ARDS), and mortality rate is higher in the pancytopenic patients.⁴ It is important for clinicians to be aware that this potentially fatal illness has a large number of protean manifestations and that pancytopenia is an alarming sign.

ΠΕΡΙΛΗΨΗ

Περίπτωση λεπτοσπείρωσης με αναστρέψιμη πανκυτταροπενία

Α. ΑΡΙΣΤΟΔΗΜΟΥ,¹ Χ. ΜΠΙΚΗΣ,² Ν. ΣΠΕΡΝΟΒΑΣΙΛΗΣ,² Α. ΓΚΙΚΑΣ,¹ Δ. ΚΟΦΤΕΡΙΔΗΣ¹

¹Τμήμα Εσωτερικής Παθολογίας-Μονάδα Λοιμωδών Νοσημάτων, Γενικό Πανεπιστημιακό Νοσοκομείο Ηρακλείου «ΠΑΓΝΗ», Ηράκλειο Κρήτης, ²Τμήμα Εσωτερικής Παθολογίας, Γενικό Πανεπιστημιακό Νοσοκομείο Ηρακλείου «ΠΑΓΝΗ», Ηράκλειο Κρήτης

Αρχεία Ελληνικής Ιατρικής 2016, 33(6):834–836

Η πανκυτταροπενία αποτελεί μια πολύ σπάνια και σοβαρή εκδήλωση της λεπτοσπείρωσης, αφού μπορεί να συνοδεύεται από άλλες δυνητικά θανατηφόρες επιπλοκές όπως η πνευμονική αιμορραγία, η μυοκαρδίτιδα και το σύνδρομο οξείας αναπνευστικής δυσχέρειας. Σκοπός της παρούσας εργασίας ήταν η περιγραφή ενός σπάνιου περιστατικού λε-

πτοσπείρωσης που προσήλθε με πυρετό, διάρροια και έμετο, ενώ τη δεύτερη ημέρα νοσηλείας επιπλάκηκε με πανκυτταροπενία. Ο ασθενής τέθηκε σε κεφτριαξόνη και έλαβε εξιτήριο μετά από 14 ημέρες σε πολύ καλή κλινική κατάσταση και με σχεδόν πλήρη αποκατάσταση των αιματολογικών και των βιοχημικών του εξετάσεων.

Λέξεις ευρητηρίου: Θρομβοκυτταροπενία, Λεπτοσπείρωση, Πανκυτταροπενία

References

1. VAN HOOSTE WLC. Leptospirosis – review of the literature. *Tijdschr Geneeskde* 2007, 63:917–928
2. BHARTI AR, NALLY JE, RICARDI JN, MATTHIAS MA, DIAZ MM, LOVETT MA ET AL. Leptospirosis: A zoonotic disease of global importance. *Lancet Infect Dis* 2003, 3:757–771
3. DAHER EF, LIMA RS, SILVA JÚNIOR GB, SILVA EC, KARBAGE NN, KATAOKA RS ET AL. Clinical presentation of leptospirosis: A retrospective study of 201 patients in a metropolitan city of Brazil. *Braz J Infect Dis* 2010, 14:3–10
4. SINGH H, TALAPATRA P, LATHER K, CHAUDHARY V. Reversible pancytopenia: An unusual presentation of leptospirosis. *Int J Med Public Health* 2014, 4:301–303
5. HARTSKEERL RA, COLLARES-PEREIRA M, ELLIS WA. Emergence, control and re-emerging leptospirosis: Dynamics of infection in the changing world. *Clin Microbiol Infect* 2011, 17:494–501
6. FAINE S, ADLER B, BOLIN C, PEROLAT P. *Leptospira and leptospirosis*. 2nd ed. MedSci, Melbourne, 1999
7. FEIGIN RD, ANDERSON DC. Human leptospirosis. *CRC Crit Rev Clin Lab Sci* 1975, 5:413–467
8. CHIERAKUL W, TIENTADAKUL P, SUPUTTAMONGKOL Y, WUTHIEKANUN V, PHIMDA K, LIMPAIBOON R ET AL. Activation of the coagulation cascade in patients with leptospirosis. *Clin Infect Dis* 2008, 46:254–260
9. STEFOS A, GEORGIADOU SP, GIOTI C, LOUKOPOULOS A, IOANNOU M, POURNARAS S ET AL. Leptospirosis and pancytopenia: Two case reports and review of the literature. *J Infect* 2005, 51:e277–e280
10. BEE PC, CHOW SK, TAN LH. A case of severe leptospirosis with pancytopenia. *Med J Malaysia* 2003, 58:777–779
11. BISHARA J, AMITAY E, BARNEA A, YITZHAKI S, PITLIK S. Epidemiological and clinical features of leptospirosis in Israel. *Eur J Clin Microbiol Infect Dis* 2002, 21:50–52
12. HADAD E, PIROGOVSKY A, BARTAL C, GILAD J, BARNEA A, YITZHAKI S ET AL. An outbreak of leptospirosis among Israeli troops near the Jordan river. *Am J Trop Med Hyg* 2006, 74:127–131
13. LESHEM E, SEGAL G, BARNEA A, YITZHAKI S, OSTFELD I, PITLIK S ET AL. Travel-related leptospirosis in Israel: A nationwide study. *Am J Trop Med Hyg* 2010, 82:459–463
14. ISSA N, GUISSSET O, MOURISSOUX G, GABINSKI C, CAMOU F. Leptospirosis and thrombocytopenia. *Rev Med Interne* 2015, 36:558–560
15. NICODEMO AC, DUARTE MI, ALVES VA, TAKAKURA CF, SANTOS RT, NICODEMO EL. Lung lesions in human leptospirosis: Microscopic, immunohistochemical, and ultrastructural features related to thrombocytopenia. *Am J Trop Med Hyg* 1997, 56:181–187
16. HAAKE DA, LEVETT PN. Leptospirosis in humans. *Curr Top Microbiol Immunol* 2015, 387:65–97

Corresponding author:

A. Aristodimou, Department of Internal Medicine, "PAGNI" University General Hospital of Heraklion, Voutes-Stavrakia Crossroads, Voutes, P.O. Box: 1352, GR-711 10 Heraklion, Crete, Greece
e-mail: a.aristodimou@gmail.com