



International Journal of Medical Research & Health Sciences

www.ijmrhs.com

Volume 3 Issue 4

Coden: IJMRHS

Copyright ©2014

ISSN: 2319-5886

Received: 1st Aug 2014

Revised: 1st Sep 2014

Accepted: 9th Sep 2014

Case report

PONTIAC FEVER ASSOCIATED WITH ERYTHEMA NODOSUM

*Hilal Bektas Uysal¹, Hulki Meltem Sönmez², Sertan Bulut³, Murat Telli⁴

¹Assistant Professor, ²Professor Department of Internal Medicine, Adnan Menderes University School of Medicine, Aytepemevkii Merkez/ Aydin 09100, Turkey

³Doctor in Pulmoner Diseases Department, Adnan Menderes University School of Medicine, Aytepemevkii Merkez/ Aydin 09100, Turkey

⁴Assistance Professor in Department of Microbiology, Adnan Menderes University School of Medicine, Aytepemevkii Merkez/ Aydin 09100, Turkey

*Corresponding author email: hilalbektasuysal@yahoo.com

ABSTRACT

Legionellae are gram-negative bacteria found in clean water sources worldwide. Infection with Legionella species presents as two distinct clinical forms; Legionnaires' Disease; characterized by pneumonia and Pontiac Fever; a flu-like illness, characterised by a high attack rate and absence of fatal complications. Cutaneous manifestations are very uncommon during Legionella infections. To our knowledge; only nine cases of legionellosis, presenting with skin rash have been reported in the literature. The striking point is, only two men in this nine cases of Legionella infections, had had Pontiac Fever. Here we present the third case of skin rash associated with Pontiac fever, reported in the literature to date.

Keywords: Pontiac Fever, Erythema Nodosum, Legionella

INTRODUCTION

Legionellae are gram-negative bacteria found in clean water sources worldwide. Water is the major reservoir of *Legionella* species.¹ Most aerosolized sources of bacterial-contaminated warm water, including whirlpool spas, warm spring pools, garden watering systems, decorative fountains, cooling towers, and industrial cleaning systems that use high-pressure water, have been linked to outbreaks of legionellosis.^{2,3}

Infection with Legionella species presents as two distinct clinical forms; Legionnaires' Disease (LD), a multisystem illness characterized by pneumonia and Pontiac Fever (PF), a self-limiting flu-like illness.⁴ It is not known why these two different clinical forms occur, but organism inoculation, transmission modes, and host factors seems to be important.⁵

Pontiac fever, occurs after exposure to aerosols of water colonized with *Legionella* species. Disease mainly diagnosed in outbreaks, rarely seen simultaneously.⁶ The first outbreak has been reported in the United States in 1967 in Pontiac, Michigan, that resulted from the contamination of the central air-conditioning system from an evaporating condenser. PF takes its name from this outbreak.⁷

LD, is characterized by an acute severe pneumonia with an average incubation time of 2 to 10 days, and a low attack rate (0.1 to 5%) in general population. PF, is the milder form characterised by a short incubation time of 30-90 h, nearly 70-90% of high attack rates⁸ and absence of fatal or long term complications⁹. Patients with PF have influenza like symptoms. After a typical asymptomatic interval of 12-48 h after exposure; fever, chills, headache,

1047

myalgia, arthralgia, malaise, sore throat, nonproductive cough, abdominal pain, nausea occurs in most of the cases.⁷⁻⁹ There is no evidence of pneumonia on chest radiography or physical examination of the patients. Slight leukocytosis with neutrophilic predominance may sometimes be detected.¹⁰

Multisystemic extrapulmonary involvement is observed during Legionella infections, however, cutaneous manifestations is very uncommon. Only a few cases of cutaneous involvement have been described to date, according to our present knowledge. Here we are reporting a Pontiac Fever case, associated with erythema nodosum.

CASE REPORT

A 39 year old woman with no underlying disease, was admitted to our clinic with malaise, non-productive cough, sore throat, hoarseness, myalgia, arthralgia and fever for 3 days followed by warm, painful, erythematous, non-pruriginous nodules on bilateral pretibial areas and swelling of the right ankle.

She did not use alcohol or tobacco. She was living in a farm and working in the garden care and in the care of farm animals. She had not travelled recently and any one of the household had had an upper respiratory infection within the preceding week.

Upon admission she had a body temperature of 37.5 °C, blood pressure of 110/60 mmHg and a pulse rate of 93 per minute. On physical examination, she had pale skin and mucous membranes, apical systolic murmur, unremarkable respiratory system and abdominal examinations. Arthritis identified on the right ankle with swelling and pain. She had red coloured, rounded, approximately 1cm in diameter, macular, painful lesions on bilateral forearms and bilateral pretibial rounded, slightly raised, nonulcerative, painful, warm, red nodules compatible with erythema nodosum (Fig-1, Fig-2)



Fig1: In a PF patient the cutaneous involvement of legs with erythema nodosum



Fig- 2: In a PF patient the cutaneous involvement of forearms.

Laboratory work-up demonstrated dimorphic anemia of both iron and vitamin B12 deficiency. Her blood test results showed the following: white blood cell count at $9,97 \times 10^3/\mu\text{L}$ with remarkable neutrophilia (82,4%), mild hyponatraemia at 135 mmol/L (normal range 136-145 mmol/L), an erythrocyte sedimentation rate during the first hour 64 mm (normal < 20 mm) and C-reactive protein rate at 65,3 mg/L (Normal range 0-6 mg/L). Chest X-ray was unremarkable.

Erythema nodosum has been associated with a wide spectrum of infections, drugs and systemic diseases, and may also be idiopathic. To consider all possible etiologies of erythema nodosum a few tests conducted. Throat swab, nasopharyngeal swab, urine cultures were negative. Antistreptolysin-O (ASO) titer was in normal range. PPD skin test for tuberculosis was 7 mm (negative for active infection in Turkey). Contrast enhanced chest CT scan was unremarkable. Pathergy test for Behcet disease was negative. Anti-ds DNA, anti-nuclear antibody and rheumatoid factor were all negative. There was no clinical or laboratory alarm sign for malignancy. The multiplex RT-PCR assay of nasopharyngeal swab for bacteria was positive for Legionella spp. Multiplex RT-PCR assay of nasopharyngeal swab for viruses was negative. Legionella Urine Antigen Test (UAT) was negative.

Immediately, bed rest, elevation of the legs and supportive therapy started. For pain management oral indomethacin 25 mg, twice a day started.

Two days after the admission, malaise, non-productive cough, sore throat, hoarseness and myalgia disappeared. Arthritis on the right ankle regressed and erythema nodosum nodules evolved from bright red to a brownish yellow discoloration resembling bruises on the fifth day of admission.

The patient became asymptomatic on the ninth day of hospital admission, laboratory examination results were all normal except the persisting increased erythrocyte sedimentation rate (43 mm/h). She discharged with a control plan after 3 weeks .

DISCUSSION

Cutaneous involvement during legionella infections is very rare, and to our knowledge; only nine cases of legionellosis, presenting with skin rash have been reported in the literature ¹¹⁻¹⁵ .The striking point is, only two men in this nine cases of Legionella diseases, had had PF.¹⁶ Here we present the third case of skin rash associated with PF.

The pathogenesis of skin involvement in the progress of PF is unknown. It was considered to be mediated either by a toxin produced by the organism or by an immunological reaction formed by the host to the bacteria, or other unidentified additional mechanisms.^{13,16}

The clinical diagnosis of PF is usually very difficult in most patients because of its nonspecific presentation. Thus, the door to successful diagnosis is, making proper microbiological tests. Serologic and urinary antigen tests (UAT) are the most useful routine tests for the diagnosis of PF.

Approximately 50% of the 48 species of Legionella and 70 distinct serogroups identified have been associated with human disease. Validated serologic testing for the majority of the 70 serogroups have not been fully developed, only Legionella pneumophila serogroup 1 (LP1) can be reliably assayed by urinary antigen tests.¹⁷ Nonpneumophila causes of the disease are particularly difficult to diagnose. The sensitivity of UAT is, proportionally increased with the clinical severity of the disease⁴. Thus, patients with PF may have been undiagnosed because of the milder clinical course, if only UAT were used. Previous studies about UATs in PF are very limited¹⁸. This may be because these tests were primarily used for diagnosis of hospitalised patients. Thus, the validity of these laboratory tests for patients with mild clinical illness and not demanding hospital admission, is not clear. In our case the negative result of UAT, demonstrates the cause of the PF is, an another species, or serogroup of Legionella, rather than LP1.

There is no agreed-upon definition of Pontiac fever. The diagnosis is usually made on the basis of

epidemiologic, clinical, laboratory, and environmental microbiology findings. Because of its benign course and the absence of specific findings, the occurrence of PF is often undiagnosed. Although, the disease is self-limiting and patients recover without treatment, the diagnosis is very important.

CONCLUSION

The diagnosis of PF is a marker of patient's environmental contamination by Legionella and thereby should be a sign for taking all prevention measures.

The case reported here demonstrates the importance of using additional diagnostic methods (RT-PCR), besides the fast and easy to perform urinary antigen tests, to obtain a more accurate diagnosis, if suspected. Furthermore, this case shows that PF can be associated with cutaneous involvement.

Conflict of Interest :Nil

REFERENCES

1. Fliermans CB, Cherry WB, Orrison LH, Smith SJ, Tison DL, Pope HD. Ecological distribution of Legionella pneumophila. *Appl. Environ. Microbiol.*1981; 41:9–16.
2. Fraser DW, Deubner DC, Hill DL, Gilliam DK. Non pneumonic, short-incubation-period legionellosis (Pontiac fever) in men who cleaned a steam turbine condenser. *Science* 1979; 205:690–1
3. Jones TF, Benson RF, Brown EW, Rowland JR, Crosier SC, Schaffner W. Epidemiologic investigation of a restaurant-associated outbreak of Pontiac fever. *Clin Infect Dis* 2003; 371:292–7
4. Diederens B. Legionella species and Legionnaires' Disease', *Journal of Infection.* 2008; 56:1-12
5. Mandell GL, Bennett JE, Dolin R Eds, Principles and Practice of Infectious Diseases, 4th edition, Churchill Livingstone, 1995: 2087.
6. Fenstersheib M, Miller M, Diggins C. Outbreak of Pontiac fever due to Legionella anisa. *Lancet* 1990; 336:35–37

7. Glick TH, Gregg MB, Berman B, Mallison G, Rhodes WW Jr, Kassanoff I. Pontiac fever: an epidemic of unknown etiology in a health department.I. Clinical and epidemiologic aspects. *Am J Epidemiol* 1978; 107:149–60
8. Pancer K, Stypulkowska-Misiurewicz H: Pontiac Fever non-pneumonic legionellosis. *Przegl Epidemiol* 2003; 576:7-12
9. Fields BS, Haupt T, Davis JP, Arduino MJ, Miller HP, Butler JC: Pontiac fever due to *Legionella micdadei* from whirlpool Spa: possible role of bacterial endotoxin. *J Infect Dis* 2001; 184:1289-92
10. Luttichau HR, Vinther C, Uldum SA. An outbreak of Pontiac fever among children following use of a whirlpool. *Clin Infect Dis.*1998; 26: 1374-78
11. Randall TW, Naidoo P, Newton KA. Legionnaires' disease in Port Elisabeth. *S Af Med J* 1980; 581:7-23.
12. Helms CM, Johnson W, Donaldson MF. Pretibial rash in *Legionella pneumophila* pneumonia. *JAMA* 1981; 2451:758-59
13. Allen TP, Fried JS, Wiegmann TB. Legionnaires' disease associated with rash and renal failure. *Arch Intern Med* 1985; 145:729-30
14. Calza L, Briganti E, Casolari S. Legionnaires' disease associated with macular rash: two cases. *Acta Derm Venereol* 2005; 85:342-44
15. Ziemer M , Ebert K, Schreiber G, Voigt R. Exanthema in Legionnaires' disease mimicking a severe cutaneous drug reaction. *Clin Exp Derm* 2009; 34:72-74
16. Spitalny KC, Vogt RL, Witherell LE. National survey on outbreaks associated with whirlpool spas. *Am J Public Health* 1984; 74: 725-6
17. Fields BS, Benson RF, Besser RE. *Legionella* and Legionnaires' disease: 25 years of investigation. *Clin Microbial Rev* 2002; 15:506-26
18. Edelstein PH. Urine antigen tests positive for Pontiac fever: implications for diagnosis and pathogenesis. *Clin. Infect. Diseases* 2002; 44:229-31