A Rare Cause of Nosocomial Infections Associated with Nephrolithiasis; Sphingomonas paucimobilis

Emrah Gün[1], Nusret Ayaz[1], Hakan Uzun[1], Mesut Okur[1], İbak Gönen[2], Cemalettin Güneş[1], Zeyneb Soysal[1], Kenan Kocabay[1]

[1]Department of Pediatrics, Düzce University Faculty of Medicine, *Düzce, Turkey*

[2]Department of Infectious Diseases, Süleyman Demirel Faculty of Medicine, *Isparta, Turkey*

Abstract

Sphingomonas paucimobilis is a gram negative, nonfermentative, oxidase positive, very slow acting bacillus. In species of *Sphingomonas*, *S. paucimobilis*, known as a pathogen, is a rare cause of nosocomial infection. *S. paucimobilis* is isolated from distilled water, labs, nebulizers, mechanical ventilators and dialysis liquids in hospital. *S. paucimobilis* is reported to have caused infection among the patients which have chronic disease or a weak immune system, and alcoholics and drug users. In this case we presented a three year old girl patient, diagnosed with nephrolithiasis, who had *S. paucimobilis* her blood culture which was taken because of fever, chills and right costovertebral angle sensitivity on the 11th day.

(J Pediatr Inf 2014; 8: 125-7)

Keywords: Nosocomial infection, *Sphingomonas paucimobilis*

Introduction

Sphingomonas paucimobilis (S. paucimobilis) is gram negative, aerobic bacteria commonly available in soil, on plant surfaces and river and drinking water and usually cause infections in humans (1, 2). *S. paucimobilis* is nosocomial infection agent that forms an S-shaped colony in the bloody agar, is yellow-pigmented, nonfermentative, non-spore forming, single polar flagellum, very slowly moving, oxidase and catalase positive, and opportunist agent. It was reported in the relevant literature that *S. paucimobilis* was community-based or nosocomial bacteremia that caused peritonitis, meningitis, gastroenteritis, catheter-related sepsis, urinary system infections, respiratory tract infections, septic arthritis, osteomyelitis, splenic and brain abscess (1, 3). In this study, we presented the case of a 3 year-old female patient who was followed with the diagnosis of nephrolithiasis and whose complaints improved after amicasin and fluid therapy, but in whose blood culture we detected. *Paucimobilis* after complaints of fever, chills, right side abdominal pain on the 11th day of hospitalization.

Case Report

A three year-old female patient was admitted to our hospital due to right side abdominal pain, vomiting and loss of appetite. We learnt afterwards that the patient was hospitalized many times due to nephrolithiasis and the last hospitalization was one month ago. We learnt from the family history of the patient that her sister was also followed up with the diagnosis of nephrolithiasis. The general condition of the patient was not bad, with clear consciousness and cooperative. In the physical examination, no pathologic finding was found except the costovertebral angle tenderness. The laboratory test results of the patient were as; Hb: 11.2 g/dL, white blood cell count: 16400/mm^3, platteted count: 376000/mm^3 and CRP: 22.8 mg/dL. Kidney and lung function tests and coagulation tests were normal. The density in complete urine test was 1023, pH: 5.5, leukocyte: ++,

Received: 08.04.2013
Accepted: 28.06.2013
Available Online Date: 31.09.2013

Correspondence Address:
Emrah Gün, MD
Düzce Üniversitesi Tıp Fakültesi, Çocuk Sağlığı ve Hastalıkları Anabilim Dalı,
Düzce, Türkiye
Phone: +90 380 542 13 90
E-mail: emrhgn@hotmail.com

DOI:10.5152/ced.2013.47

erythrocyte: +++ and nitrite were also positive. In the urine microscopy examined by flow cytometry method, there existed 432 erythrocyte/HPF, 713 leukocyte/HPF, 4 bacteria/HPF. In the routine upright abdomen graphy of the patient, opacity-generating calculus was present on the right kidney level. In the whole abdomen ultrasonography, 9 mm dimensional hypoechogeniccalculus image whose shadow was on the posterior was present on the right kidney pelvis. The patient was hospitalized with the diagnosis of nephrolithiasis. The patient, whose urine culture and blood culture were taken, was given intravenously 15 mg/kg/day amicasin, 1/3 2000 cc/m^2 fluid treatment and 10 mg/kg/dose paracetamol treatment, if needed. The patient was replaced a urinary catheter. In the evaluation of urdithiasis etiology of the patient, calcium parathormone, 25-hidroksi vitamin D, calcium in spot urine, creatinine and calcium/creatinine were all in normal ranges. The IgA, IgG and IgM levels of the patient were in normal range. In the examination of blood and urine amino acids, no pathologic symptoms were found except mild level of glutamine increase in the urine. The patient who was consulted by the urology department was told that there was no need for an operation, but the patient needed to be followed up in the hospital. The complaints of the patient with negative urine and blood cultures, started to improve on the 7th day. Leukocyte, erythrocyteandnitrite were positive in the routine urine test taken on the 7th day. The antibiotic treatment of the patient whose white blood cell count receded to 8400/mm^3 was stopped, but the fluid treatment continued since the oral drug intake was not good. In the physical treatment of the patient on the 11th day hospitalized with the complaints of fever and chills, no pathologic symptoms were found except the right costovertebral angle tenderness. The white blood cell count of the patient was: 10900/mm^3, Hb: 11.4 g/dL and CRP: 2.3 mg/dL. Kidney and lung function tests and coagulation tests were normal. In the routine urine test, leukocyte was positive and erythrocyteand nitrite were negative.

The patient was given 100 mg/kg/day ceftriaxone treatment. No bacteria yielded in the urine culture. Gram negative bacteria yielding was found in the blood culture on the 11th day. The bacteria was named as *S. paucimobilis* by using VITEK 2 automatized system (bioMerieux Inc, Mercy L'etoli, France). It was reported that this bacteria was sensitive to ceftriaxone, gentamycin, amicasin, piperacillin, sparfloxacin and ceftazidime; and resistant to colistin. Ceftriaxone treatment of the patient continued for seven days. Patient's complaints improved and oral intake was good. The patient whose white blood cell count decreased to 8000/mm^3, CRP: 0.10 g/dL and whose general performance was good and vital symptoms stabile was discharged from the hospital provided that her parenteral antibiotic treatment was to be completed to 10 days. The patient was referred to a center that had a pediatric nephrology department.

Discussion

S. paucimobilis was first discovered as an agent in humans in 1977 and was named as *Pseudomonas paucimobilis* (3). It was reported to be the cause of leg ulcer, meningitis and septicemia in 1979 and the name was changed as *S. paucimobilisin* 1979 (1, 3). Among the *Sphingomonas* types, there are also clinically insignificant microorganisms such as *Sphingomonas mucosissima* and *Sphingomonas adhesiva*; however, it is the *S. paucimobilis*whose pathogenic effect is very well known (4). The virulence of *S. paucimobilis*in comparison to *Pseudomonas*is lower and rarely causes nosocomial infections (5). The facts that *S. paucimobilis* does not include lipopolisaccharides on the cell wall and therefore not have endotoxin production are responsible for serious infections (6).

S. paucimobilis isolated in various environments such as water systems in hospital contexts, distilled water, in laboratories, dialysis liquid, respirators and nebulizers may cause community-based or nosocomial infections (1). It was reported that *S. paucimobilis*-related serious infections might develop in patients who has some underlying diseases such as chronic renal failure and chronic lung disease, who had alcohol addiction and used intravenous, and who used immunosuppressive drugs (7).

In a study involving 16 patients in whom *S. paucimobilis* was found as an etiologic agent, it was reported that average age of the patients was 48.5 years old, and 57% of them had malignity, 40% immunosuppressive drug-use history, and 11.9% an underlying disease likediabetes mellitus. In this study, it was revealed that 69% of the *S. paucimobilis*infections were associated with nosocomial bacteremia. No *S. paucimobilis*-related mortality was reported in this study. It was reported in this study that the most effective antibiotics were fluoroquinolone, carbapenem, beta-lactam andbeta-lactamaseinhibitor combinations (8). The immunoglobulin level in our patient was in normal range and there was no any clear immunodeficiency.

It was reported that *S. paucimobilis* caused septic shock in a patient monitored with acute myeloid leukemia just before stem cell transplantation, peritonitis in another patient given peritoneum dialysis andcaused endophtalmitis in another patient (9, 10). It was reported that it caused pneumonia in a Down syndrome patient with a cardiac surgery history, bronchopneumonia in another patient with ventriculoperitoneal shunt (1, 3). In a Turkish

study, it was reported that *S. paucimobilis* was reproduced on the background of submandibular sialolithiasis (11). Nephrolithiasis was present in our case and we have never come across any nephrolithiasis-related *S. paucimobilis* infection in the literature. The fact that *S. paucimobilis* was reproduced on the background of sialolithiasis (11) and that it was reproduced in a nephrolithiasis just like in our study demonstrates that it has an increased risk of prevalence on a stone background.

Conclusion

In conclusion, *S. paucimobilis*commonly available in nature and sometimes isolated in a hospital environment is a rare nosocomial infection agent (1). It may cause serious infections especially in patients with chronic disease history and weak immune system (9). Patients should be treated with the sensitive antibiotics in the antibiogram.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - E.G., M.O.; Design - E.G., N.A.; Supervision - H.U., İ.G.; Funding - C.G., Z.S.; Materials - E.G., N.A.; Data Collection and/or Processing - E.G., N.A.; Analysis and/or Interpretation - E.G., N.A.; Literature Review - E.G., N.A.; Writing - E.G., N.A.; Critical Review - M.O., H.U., K.K.; Other - E.G.,N.A.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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