Infection of Pseudomonas luteola: Case Report of Septicemia

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Abstract

Pseudomonas luteola was regarded a rare bacterial pathogenic infected human, infected several locations of the human body, particularly in immunocompromised individuals, and there was a report of a unique case in blood and causes of septicemia related to Pseudomonas luteola.

Keywords: *Pseudomonas luteola, septicemia, anti-therapeutic agents, pathogenic bacteria.*

INTRODUCTION

Pseudomonas luteola (CDC class Ve-1 or Chryseomonas luteola) is a gram-negative rod which is motile that contains a unique yellowish color (1). This organism is not fermentative, has no oxidase activity, and is catalase positive (2). P. luteola has been collected from several natural sources (water, soil, and moist settings) and is thought to be a saprophyte or commensal organism that is only infrequently harmful to people (3). Clinical infections caused by this microbe have been described seldom (fewer than 25 cases) and have generally manifested as septicemia, meningitis, peritonitis, endocarditis, and ulcer infections, usually in conjunction with surgical procedures or the use of catheters or prosthesis (4). It has been proposed that this organism will become increasingly common as a nosocomial infection (5). P. luteola clinical isolates have been demonstrated to be responsive to extended-spectrum cephalosporins (ESC), aminoglycosides, and fluoroquinolones (6). Resistance to original spectrum and broad-spectrum cephalosporins was reported in the majority of studies in which isolates were tested with a wide panel of beta-lactam antibiotics, although susceptibility to penicillins was varied (7). This trait of beta-lactam resistance shows that this bacteria may manufacture a natural beta-lactamase (8).

Case report

Eighty-year-old male, with previous history of diabetes mellitus type II, high blood pressure and hepatitis type C, presented to the hospital with septicemia. Physical examination revealed a blood pressure of 180/90 mmHg, pulse of 100 beats/min and body temperature of (40.7 °C). The heart sounds were normal and there was no murmur. Results of Laboratory investigations included hemoglobin (6.1 g/dl), white cells

count (14000/mm³), C-reactive protein (65 mg/L), HbA1c (7.8%) and creatininemia (895 µmol/l). Blood sample was taken and culturing on MacConkey, agar media, blood agar media and Chocolate agar media, after 7 days, the colonies appearance spreading flat and serrated edges, after that, the colonies were identified by Gram stain, biochemical tests and Vitek system. Biochemical test carried out for organism identification, the results were shown in Table (1). P. luteola was identified by using Vitek system. Antibiotics susceptibility test were used, and it was sensitive to Imipenem, Ciprofloxacin, Gentamycin and Amikacin, while resistance to Amoxillin- Clavlanic acid, Cefotaxime, Ceftazidime, Aztreonam and Ceftriaxone as shown in Table (2). A total duration of treatment extended for 10 days with good outcome. After 15 days, the patient was admitted again with a severe sepsis (hypotension 60/42, pulse 115 bpm), with high fever (40.9 °C). Laboratory diagnosis included a hemoglobin of 7 g/dl, a white blood cell count of 18000/mm³ and a C-reactive protein level of 126 mg/L. The serum level of sugar was 528.9 mg/dl. Electrocardiogram and chest X-ray were normal. His breathing and heart were monitored. At this time, blood sample was taken and showing countless leukocytes. Culturing and diagnosis by Vitek system, the results were showed that, P. luteola were appeared. The patient was dead due to severe sepsis caused by septicemia.

Table (1): The main characteristic features of Pseudomonas luteola isolates

No.	Characteristic	Result
1.	Oxidase test	negative
2.	Catalase test	positive
3.	Kligler iron	A/A
4.	H_2S	negative
5.	Gas production	negative
6.	Urase	positive
7.	Indole test	Negative
8.	Growth at 42°C	positive
9.	Esculina	positive
10.	Flagellar morphology	Multitrichous
11.	Arginine dihydrolasea	positive
12.	Vitek system	*Pseudomonas luteola*

Table (2): Antibiotic susceptibility test of Pseudomonas luteola isolates

No.	Antibiotics	Zone size (mm)	Susceptibility
1.	Amoxillin-clavlanic acid	11m	Resistance
2.	Cefotaxime	10mm	Resistance
3.	Imipenem	24mm	Sensitive
4.	Ciprofloxacin	33mm	Sensitive
5.	Ceftazidime	11mm	Resistance
6.	Gentamycin	23mm	Sensitive
7.	Amikacin	22mm	Sensitive
8.	Aztreonam	15mm	Resistance
9.	Ceftriaxone	15mm	Resistance

Discussion:

P. luteola is an aerobic gram-negative bacillus. Because of the strong evolutionary relationship between Chryseomonas and Pseudomonas, this bacteria was renamed Pseudomonas luteola (9). Its habitat is unknown, however it is commonly found in water, dirt, and damp areas (10). All of the previously described examples show that, although being an uncommon saprophyte, P. luteola might emerge as a potential pathogen (11). Immunosuppressive disorders such as the use of corticosteroids and other immunosuppressive medication, malignant tumors, and chronic renal failure are all risk factors for infection with P. luteola (12). In certain situations, the infection is linked to indwelling catheters or prostheses (13).

Nosocomial infections are more common than community-acquired illnesses, particularly in immunocompromised individuals (14). Hmida et al., (15) identified group Ve-1 strains as Pseudomonas luteola for the first time (). Because P. luteola was a senior subjective synonym of Chryseomonas polytricha, Quintieri et al., (16) reclassified the species in the genus Chryseomonas as P. luteola. Because of the strong evolutionary relationship between Chryseomonas and Pseudomonas, this bacteria was renamed Pseudomonas luteola (17). Some writers still refer to the bacterium as Pseudomonas luteola, while others refer to it as Pseudomonas luteola (18), (19). Previous research has shown that Pseudomonas luteola can cause septicemia, peritonitis, and endocarditis in people with medical conditions or who utilize indwelling devices (20). 14 instances of Pseudomonas luteola infection have been recorded thus far (21). The bacteria was isolated from the blood of seven people. Septicemia, meningitis, osteomyelitis, endocarditis, and peritonitis are the most common infections. Its capacity to infect severely sick individuals who have had surgical procedures and/or have indwelling devices has also been documented (22). In several cases, the infection was linked to other variables such as immunosuppressive medication, chronic renal failure, and cancer (23). Pseudomonas luteola infections in people have never been documented in Baghdad, as far as we know. It was described in this paper as one instance at a Medical City Hospital in Baghdad. This case included predisposing or linked factors: the first patient was an elderly man with a history of type II diabetes, high blood pressure, and hepatitis C who arrived to the hospital with septicemia. P. luteola is found to be resistant to Amoxillin-clavlanic acid, Cefotaxime, Ceftazidime, Aztreonam, and Ceftriaxone, but sensitive to Imipenem, Ciprofloxacin, Gentamycin, and Amikacin.

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