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Pathogenic Potential of *Pseudomonas luteola* in camel

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Abstract

Pseudomonas luteola also called *Chryseomonas luteola*- is uncommon pathogenic agent that usually isolated accompanied with other infected pathogen in human. It have been isolated in human as diagnosed with prosthetic valve endocarditis developed 16 months after cardiac surgery [1]. In addition, *Ps. luteola* presented as a final diagnosis in both human cases one with obstructive pulmonary diseases (2011), while the other with non-shown symptoms (2012) using Phoenix automated microbial identification system [2]. Otherwise, these bacteria estimated relatively be nonvirulent cause of chronic endophthalmitis [3].

Keywords: *Pseudomonas luteola; Chronic Endophthalmitis;* Pathogenic Agent

Introduction

The most important point related to *Pseudomonas luteola* bacterium were reported that is constitutes a significant nosocomial infection pathogen causing infections associated with foreign material, when it has been incriminated as a possible cause of cutaneous abscess and bacteremia in a man [4]. Moreover, we can believe that *Ps. luteola* can cause both community and hospital acquired bacteremia according to the case that reported seven patients, 9 years old were diagnosed with *Ps. luteola* bacteremia, six of these patients had hospital-acquired bacteremia, whereas one patients had, community acquired *Ps. luteola* [5].

There are no cases reported the *Pseudomonas luteola* bacterium cause any infection in animal except pet ferrets. One case reported three ferrets with acute episode of dyspnea; *Ps. luteola* was isolated from plural exudates [6]. Other case reported both gender ferrets were present with pyogranulomatous subcutaneous inflammation affecting the inguinal, preputial and femoral regions, *Ps. luteola* was isolated from lesions in both cases [7].

Current study discuss a female camel - 4.5 years old - case with large abscess on her right abdominal area, the animal healthy generally with no temperature or abnormal signs, abscess started form in the animal 1.5 years old, and its repeatedly re-form each three months exactly. An operation had applied to the animal to insure if any foreign body induces abscess formation, but it resulted negatively.

In revising the history in this case, mother was infected with abscess in chest area, formed each summer, continued for six years, and completely recovered, but we cannot ensure that both animal infected with same bacteria because we did not isolate bacteria from the mother.

Pseudomonas luteola bacteria isolated from daughter abscess.

Materials and Methods

Clinical examination was carried out on the animal with physical examination of abdominal distension. A sample of abscess was spilt out in sterile container and processed within few hours of collection. The purulent material was cultured in both blood agar (general-purpose agar based with 5% of sheep erythrocytes) and Macconkey (selective and differential culture medium) and incubated aerobically for 24 hours at 37°C. The sample cub-cultured six times to purify the sample. Gram staining was performed on primary sample and on representatives isolated colonies in each sub-culture. Oxidase test and catalyze test were performed on a pure colony. Microorganism identified using API 20 NE (The analytical profile index). General blood evaluation was performed on a blood sample from this animal. Antibiotic susceptibility tests were performed on the definitive bacterial colony using Kirby-Bauer method.

Results and Discussion

External abscess ranging in width 4 cm and depth 23 cm could increase due to a huge amount of abscess produced that estimated around 1 - 1.5l each three months.

Direct Gram-stain smears of the purulent content of abscess obtain massive gram-negative organisms, with definitive neutrophil. In clear sub-cultured colonies, Gram stain was a pure gram-negative bacilli, approving that with KOH test positively.

The growth was occurred in blood agar; a clear grayish round colonies were obtained, with partial hemolysis (breakdown of red blood cells (RBC) in blood agar), and in Macconkey shown strong positive Lactose-fermenter colonies.

Oxidase test applied on one isolated colony obtained strong positive result; so bacterium required utilizing oxygen to survive also catalyze test applied on a pure colony obtained positive result, which reflected that bacterial isolated is able to produce catalase enzyme.

The organism was identified by the API NE system (BioMerieux) using (API for non-Enterobacteriaceae): (*Pseudomonas luteola*, profile code, 5467743 > 98.2%), whereas P. Luteola was positive to reduction of nitrates to nitrites, hydrolysis β-glucosidase (ESC), reduction Glucose, Arabinose, Mannose, Mannitol, N-Acetyl-Glucosamine, Maltose, Potassium Gluconate, Malate, Trisodium citrate and Phenylacetic acid. While it was negative to indole production (TRyptoPhane) test (TRP) also reduction of Capric Acid and Adipic acid. Anaerobically, the bacteria was positive to glucose fermentation while negative to Arginine dihydrolase and Urease test.

Blood sample investigation resulted normal erythrocytes status, with normal: red blood cell count (RBC 9.19x106/µL), hemoglobin (13.7 g/dl), packed cell volume (39.9%), mean corpuscular volume (43.5 fL), mean corpuscular hemoglobin (14.9 pg) and mean corpuscular hemoglobin concentration (34.3 g/dl). While results showed abnormal leukocytes status, normal total white blood cell count (8.50 x 10^3/µL), with elevated neutrophil count (6.56 x 10^3/µL - 77.2%) (REF. 41-65%), sever decrease lymphocytes (.732x10^3/µL - 8.61%) (REF. 43 - 63%), elevated monocytes (.793 x 10^3/µL - 9.34%) (REF. 1.1 - 0.09%), slight increased basophil (.120 x 10^3/µL - 1.41%) (REF. < 0.1%) and normal eosinophil (.291 x 10^3/µL - 3.42%) (REF. 3 - 9%).

Pseudomonas luteola bacteria was resistant to Aminoglycosides antibiotics, Cephalosporins and Tetracycline, while only sensitive to Ampicillin (β-lactamase antibiotics) and meropenem (Carbapenems antibiotics) using Kirby-Bauer method (Table 1). For human infection isolations was sensitive to gentamicin, piperacillin-tazobactam, ceftazidime, cefepime, meropenem, colistin and levofloxacin [2].

Antibiotic species	Resistant	Sensitive
Aminoglycosides		
Streptomycin	+	
Amikacin	+	
β-lactamase		
Ampicillin		+
Carbapenems		
Meropenem		+
Cephalosporins		
Cefpodoxime	+	
Cefotaxime	+	
Chloramphenicol	+	
Tetracycline	+	

Table 1: *Antibiotics susceptibility of P. luteola.*

Conclusion

As the previous article shows that *Pseudomonas luteola* was isolated from a domestic animal as it's first time, the infection was locally that doesn't affect the blood count measurements and the doesn't affect the tissue around also. The bacteria shows sensitive results for β-lactamase and Carbapenems antibiotics species, while shows resistant for Aminoglycosides and Cephalosporins and Chloramphenicol and Tetracycline. This bacteria is interested an capable for further studies in different animal species.

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