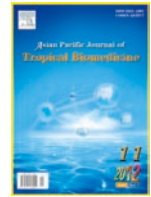




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Fatal *Delftia acidovorans* infection in an immunocompetent patient with empyema

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ABSTRACT

Delftia acidovorans (earlier known as *Comamonas acidovorans*) is an aerobic, non-fermentative, Gram negative rod, classified in the Pseudomonas rRNA homology Group III. Reports of isolation of the organism from serious infections like central venous catheter associated bacteremia, corneal ulcers, otitis media exist. The microbiologists can identify this organism based on an orange indole reaction. This reaction demonstrates the organism's ability to produce anthranilic acid from tryptophan on addition of Kovac's reagent; which gives the media its characteristic "pumpkin orange" colour. Here we report the isolation of this organism from the Endotracheal tube aspirate of a 4 year old child. With the increasing use of invasive devices, it has become important to recognize these non fermentative gram negative bacilli as emerging source of infection even in immunocompetent individuals.

1. Introduction

Delftia acidovorans (earlier known as *Comamonas acidovorans*) is an aerobic, non-fermentative, Gram negative rod, classified in the Pseudomonas rRNA homology Group III. It has a wide geographic distribution and is believed to be non pathogenic usually. The microbiologists can identify this organism based on an orange indole reaction. This reaction demonstrates the organism's ability to produce anthranilic acid from tryptophan on addition of Kovac's reagent; which gives the media its characteristic "pumpkin orange" colour.

Reports of isolation of the organism from serious infections like central venous catheter associated bacteremia, corneal ulcers, otitis media exist^[1,2]. Recent literature indicates an increasing rate of isolation of this organism from immunocompetent individuals^[3]. This indeed is a disturbing trend. Secondly, *Delftia acidovorans* is resistant to Gentamicin, a drug which is used empirically in most Gram negative infections. Thus, a need to identify this organism

upto the species level becomes very important.

2. Case report

A 4 year old female child presented to the pediatric emergency services with symptoms of fever, cough and respiratory distress. There was no history of similar episodes in the past. On examination, the patient was febrile with a temperature of 38 °C, a pulse rate of 98/min and respiratory rate of 26/min. On cardiovascular examination, S1 and S2 were heard normally. Respiratory system showed rales on the right side of the chest. No chest indrawing or mouth breathing was seen.

Laboratory studies revealed hemoglobin of 11 gm. Total leucocyte count was 6350 with a differential count of 60% neutrophils, 3% eosinophils and 37% lymphocytes. All biochemical parameters were within normal limits. A blood culture done at this stage was sterile. On day 3 of admission, patient's chest X-ray showed features of right sided empyema; hence intercostal drainage tube (ICD) was inserted. The patient received injection Ceftriaxone and Injection Amikacin. The ICD was kept till day 10 following which the patient's endotracheal tube aspirate and the ICD tip were sent for pyogenic culture. In the laboratory, the

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samples were inoculated on 5% sheep blood agar and MaConkey agar. After 48 h of incubation at 37 °C in ambient air, 2–3 mm, non hemolytic, moist colonies were seen on 5% sheep blood agar and 2–3 mm, non lactose fermenting colonies were seen on MaConkey agar. Biochemically the organism showed an orange indole reaction. It was a urease non producer, KIA was not fermented and no gas or H₂S was produced. When the organism was grown on nutrient agar and Kovac's reagent was added to the media, the colonies turned orange. Identification with VITEK2 colorimetric card (bioMerieux) gave an identification of *Delftia acidovorans* with a probability level of 98%. The organism was resistant to Gentamicin, Cefazidime, Tetracycline, Meropenem and sensitive to Cefaperazone–sulbactam. It was presumptively identified as *Delftia acidovorans* which was confirmed using standard biochemical tests^[4]. The same organism was isolated from a second sample of Endotracheal tube aspirate. The patient was started on Inj Cefaperazone–sulbactam. On Day 12 of admission, the patient worsened considerably, developed septic shock and succumbed to a cardiac arrest.

3. Discussion

Delftia acidovorans is an unusual pathogen in many respects. Its ubiquitous presence makes it difficult to determine its pathogenicity. In this case, a repeated isolation of the organism from the endotracheal tube aspirate when the patient had an active infection, was an indicator that the organism might be a pathogen. Secondly, its intrinsic resistance to aminoglycosides can be the cause of the progressive deterioration of the patient as she was on injection Amikacin.

Delftia acidovorans infections have been reported from cases of endocarditis, ocular infections, acute suppurative otitis media, bacteremia, urinary tract infections, intravascular catheter related infections and empyema^[2,5–8]. Serious infections have been reported from immunocompromised individuals. However, recent reports indicate the presence of these infections in immunocompetent individuals also^[3]. Thus it becomes important for the microbiologist to identify these non fermenting Gram negative bacilli to ensure the correct treatment as it shows resistance to aminoglycosides. An orange indole reaction could be an effective indicator of this infection and repeated isolation should ring an alarm bell of the potentially pathogenic nature of this organism. As *Delftia acidovorans* infections increase in immunocompetent individuals, it has become very important to study the pathogenicity of this organism.

In conclusion, this case emphasizes the growing relevance of Non fermentative Gram negative bacilli as potential pathogens in hospital settings, in both immunocompetent

and immunocompromised individuals. Patients with indwelling devices often have a higher risk of these infections. Distinguishing these species on the basis of biochemical tests is extremely difficult and laboratories now depend on commercial identification systems. Molecular methods are increasingly being used for this purpose. However, a strong suspicion of *Delftia acidovorans* when an orange indole reaction is observed in the laboratory can help in an early presumptive diagnosis of this organism. As infections with these organisms become more common, it is essential for the laboratory to formulate simple identification schemes for non fermenting gram negative rods.

Conflict of interest statement

We declare that we have no conflict of interest.

Acknowledgments

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