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CASE REPORT

SPHINGOMONAS PAUCIMPBILIS: A PERSISTANT GRAM NEGATIVE NOSOCOMIAL INFECTIOUS ORGANISM – A RARE CASE REPORT

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Abstract

Sphingomonas paucimpbilis (previously known as Pseudomonas paucimobilis) is a Gram Negative, Strictly aerobic, non-sporing and nonfermantative bacillus. It is a catalase and oxidase positive and produces yellow pigmented colonies. This low virulent organism is found in both Natural enviouronment (mainly Water and soil) and hospital enviouronment. This opportunistic pathogen is capable of causing both community acquired and Nosocomial infection such as Catheter related infection, peritonitis, osteomyelitis, diarrhea, meningitis, UTI, skin infection. Catheter related infection is most common. Sphingomonas paucimobilis is rarely isolated clinical specimen.

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Key Word- Sphingomonas paucimpbilis, Pseudomonas paucimobilis, Nosocomial infection, non-fermantative bacillus.

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INTRODUCTION

Sphingomonas paucimobilis (previously it was known as pseudomonas paucimobilis) is a strict aerobic, non-spore forming, non-fermenting, opportunistic, gram negative bacillus that is slightly mobile by a single polar flagellum, hence named paucimobilis[1]. Organism is present both in natural environment (mainly water & soil) and also in health care environment[2]. This organism is opportunistic[2], takes advantage over underlying immune-compromised condition and rarely may become

pathogenic. Infection with Sphingomonas paucimobilis may be commonly acquired and hospital acquired (Nosocomial)[3].

CASE REPORT

A 59 years old male patient was admitted in ICU with chief complaints of Cough, breathlessness and blood streaking of sputum for last two and half months. He was a known case of Diabetis Mellitus type-2, hypertension, LVF with ejection fraction of 20% and DCMP. At the time of admissionhis BP was 80/50, PR-152, RR-20, SPO2-93% on room air. Chest x-ray was done, which revealed right sided Hydropneumothorax. ICD under water seal was done immediately, and pleural fluid was sent for ZN stain, fungal smear, and cytology. Patient was advised for CT chest. Sputum was sent for ZN stain and pyogenic culture/sensitivity. His RFT were deranged so he was taken for HRCT chest, which revealed right zone lesion with right sided lesion. His sputum for AFB and culture was negative. Pleural fluid culture grew sphingomonas paucibilis which was sensitive to ciprofloxacin, gentamicin, cotrimoxazole, amikacin, cefaperazone/ sulbactum, ceftazidime, levofloxacin, piperacillin/tazobactum, cefepime, dorepenam, imepenem, meropenam, tircarcillin/clavulanate, trigecycline but was resistant to colistin. Patient's antibiotics were modified according to culture sensitivity. Subsequent chest x-ray showed left upper zone hydropneumothorax. After a course of antibiotics pleural fluid was repeated for pyogenic culture sensitivity. Repeated growth showed strenotrophononas maltophilia, which was also sensitive to chloramphenicol, cotrimoxazole, ceftazidime, levofloxacin, ticarcillin/ clavunate. Patient was continued on same antibiotics. HRCT chest was repeated which revealed right loculated hydropneumothorax, with areas of bronchiectasis and surrounding consolidation involving right upper lobe suggestive of infective etiology. Surgery opinion was taken and right ICD was placed in OT under sedation. Post ICD chest x-ray showed good chest expansion and patient showed improvement.

DISCUSSION

Sphingomonas is a strictly aerobic, non-sporing, Non-fermentive, oxidase positive, Gram positive bacilli, that produces yellow pigmented colony when grown on blood agar. This organism is slightly mobile with single polar flagellum. It was first classied as pseudomonas paucimobilis by Homes et al yabuchi et. al.[4]. He classified it in sphingomonas paucimobilis. These nonfermenting gram negative bacilli are of significant importance in health care setting, being the common cause of nosocomial infection[2].

The main opportunistic pathogen from gram negative bacilli is Acinobacter baumannii, Burknolderia cepacia, pseudomonas aeruginosa, and ralstonia pickettii and stluntotrophomonas maltophilia. Sphingomonas paucimobilis is also one of these & is an emerging opportunistic pathogen. The genus sphingomonas is further classified into four genera[2, 5]

1. Sphingomonas sensu strict
2. Sphingobium
3. Novosphingobium
4. Sphingopyxis

Sphingomonas paucimobilis is found in both natural & health care enviourment .It has been isolated from salt water, River water, waste water, mineral water, water equipment in hospitals. Space shuttle water system, laboratory based water system & in dental water. The organism can easily colonise in hospital chemicals/fluid and enviourment like respirator, hemodialysis devices, thermometer probes and indwelling catheters[1, 3, 6].

Cases have been reported with I/V infusion of contaminated fentany[1].

Sphingomonas paucimobilis is a low virulence organism[2]. It's low virulence is because organism lacks lipopolysaccharide layer and instead has sphingolipids in the wall[4, 6]. The first case of sp to cause human infection was reported in 1979 .

Sphingomonas paucimobilis is an oligotrophic bacteria that is it can survive in a low nutrient (carbon) enviourment[8]. Sphingomonas paucimobilis has bio-degrative abilities & is widely used in biotechnology[2, 6].

According to Hansiong et al, in case of community acquired infection, primary bactremia is most common presentation[7].

According to Cheong et al, the most common type of infection was catheter related infection. Primary bactremia was the second most common infection[9].

Sphingomonas paucimobilis is an opportunistic pathogen and identification of the organism from clininal specimen is rare. However it has been isolated from blood, sputum, urine, wound, bil, CSF, vagina & cervix[7].

Study of Honsiong et al, showed that community acquired infection, Diabetes mellitus and alcoholism were significant risk factors for primary bactremia[7]. The organism is usually resistant to penicillin & first generation because of production of chromosomally encoded beta lactamase production but variable susceptible to 3rd generation cephalosporin and fluoroquinolones. The organism is usually susceptible to

tetracyclines, chlormphenicol, aminoglycosides, carbapenams and trimethoprim & sulphamethoxizole[3].

According to Bayram et al, carbepenam is the most effective drug[10]. Higher susceptible to carbapenam was also shown by Honsiong toh et al[7]

In our case organism was found susceptible to Sphingomonas paucimobilis being an low virulence, opportunistic pathogen may be missed from clinical specimen.

But in view of emerging as a pathogen particular, in immuno-compromised condition. It should be considered as a possibility. Whenever gram negative bacilli are the causative agent.

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Fig 1 Sphingomonas on blood agar

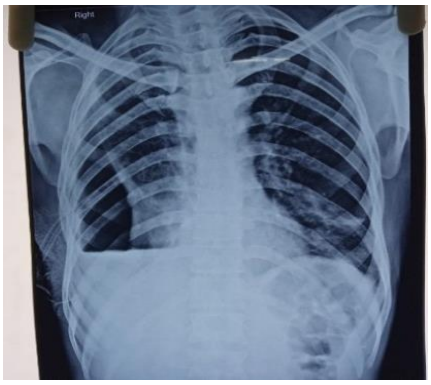

Fig 2 Chest x-ray showing right side Hydropneumothorax and chest tube in situ

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