Case Report

Journal of Microbiology and Related Research
Volume 3 Number 2, July - December 2017
DOI: http://dx.doi.org/10.21088/jmrr.2395.6623.3217.16

Catheter Related Blood Stream Infection Caused by *Roseomonas Gillardi* in a Neutropenic Patient with Osteosarcoma

Vipul Patel*, Bhavin Kapadiya**

Author Affiliation
*Director, Infectious Diseases Care Clinic, 3rd Floor, Shubham Superspeciality Hospital, Near Sarda Patel Statue, Naranpura, Ahmedabad, Gujarat 380013, India. **Lab Director of Speciality Microtech Lab, Navrangpura, Ahmedabad, Gujarat 380009, India.

Corresponding Author
Bhavin Kapadiya,
Lab Director of Speciality Microtech Lab, 121 Akshar Arcade, Nr Vijay Cross Road, Opp Memnagar Fire Station, Navrangpura, Ahmedabad, Gujarat 380009, India.
E-mail: bhavinhetal@yahoo.co.in

Received on 13.09.2017,
Accepted on 25.09.2017

Abstract

Roseomonas gilardii is gram negative pink pigmented non fermentive bacteria and has been responsible for rare cause of human infections. The bacterium considered in recent years to be uncommon, yet potentially of clinical importance as an opportunistic pathogen mostly in patient with underlying disease particularly malignancy. We reported the case of Catheter related blood stream infection in African patient who is on chemotherapy with underlying malignancy. The organism was initially identified by phenotypical characterization and confirmed by 16S RNA gene sequence analysis. Very few such cases had been reported in India.

Keyword: Catheter Related Blood Stream Infection; *Roseomonas Gillardi*.

Introduction

Roseomonas is pink pigmented gram negative, non lactose fermentive coco bacilli. The genus previously classified in to genus *Methylobacterium*. By biochemical reaction and DNA hybridization, 42 strain of pink pigmented gram negative bacteria had been separated from genus *Methylobacterium* and new group has been introduces as "pink coccoid"[1]. The majority clinical isolate were from blood. We are presenting the case catheter related blood stream infection due to *Roseomonas gillardi* in 19 year male patient form Nairobi suffering from Osteosarcoma of iliac bone and he was on chemotherapy.

Case Report

A 19 year male patient from Nairobi was referred to our oncology department with having 3 month history of dull ache in the right pelvic region. CAT scan of the pelvis showed a right iliac bone mass characteristic of Osteosarcoma. Open biopsy were performed and diagnosed as Osteosarcoma of right iliac bone. PET scan has been done and suggestive of non metastatic. Wide excision has been planned, performed and Implant has been fixed. Patient was ifosfamide and etoposide chemotherapy. After the second cycle of Chemotherphy, patient developed high grade fever. His investigation showed Hamoglobin of 8.5 gm%, Total leucocyte count of 2640 cells/microliter, Differential count- Neutriophil 52%, Lymphocyte 30%, Eosinophil 02%, Monocyte 15%, Platelet count of 3,15,000 cells/microliter and Procalcitonin 1.15ng/ml. Febrile illness with leucopenia and high procalcitonin were suspicious of CRBSI (Catheter related Blood stream infection). Blood was withdrawn for two blood culture set, from peripheral vein and from port line and inoculated each in to Bactec Plus Aerobic (10ml), Bactec Plus Anaerobic(10 ml) and Bactec Myco-F bottle (5ml). The port line Plus Aerobic and Myco-F bottle beeped positive at 34 and 35 hours of incubation respectively.

Peripheral vein Plus Aerobic and Myco-F bottle were beeped positive at 40 and 44 hours of incubation respectively. Sub culture from positive bottle done on Sheep Blood Agar, MacConkey agar, Neutrient Agar and Chocoloate agar. Neutrient agar showed pink colored colony (Figure 1) with in 24 hours of incubation at 37^{0}C. Species identification was done on Vitek 2 and identified as *Roseomonas gilardii*. As it is unusual organism, colony further processed for bacterial 16S rRNA gene sequence analysis for confirming the phenotypical method of identification by genotypic method. The identified sequence were queried to library Sepsitest™ BLAST, Version 0.9, DB rel. 95.2 for match and BLAST hit with highest sequence identity as, Species *Roseomonas gilardii,* Sequence identity = 99.0%; E-Value = 0.0; Accession = AY150045. Antimicrobial susceptibility showed sensitive to Ampiclin (MIC ≤ 2) Ceftriaxone (MIC ≤ 1), Cefipime(MIC≤4), Imipenem(MIC≤0.25), Meropenem(MIC≤0.25), Amikacin(MIC≤2), Gentamicin(MIC≤ 1), Ciprofloxacin(MIC ≤ 0.25) and Tigecycline(MIC≤ 0.5). Cefoperazone + Sulbactum was intermediate (MIC 32).

After having culture report, Port has been removed. Patient treated with Imipenem 1gm 8 hourly and Amikacin 10mg/kg/day. After the third day of antimicrobial therapy, patient became afebrile. Antimicrobial therpy were continued for 10 days. Post antimicrobial therapy, repeat blood culture has been taken twice with one week gap and all were reported as sterile.

Fig. 1:

Discussion

Roseomonas gilardii is a gram-negative coccobacilli having pink colored colonies and belonging to the genus *Roseomonas.* This bacteria consider to be environmental bacteria and have been reported from clinical specimens for the last 4 decades. Initially this group had been referred to as Pink Coccoid groups[2,3]. Rihs et al has worked on 42 isolates of pink pigmented bacteria and classified genus into six *Roseomonas* species, 1 to 4 based on biochemical reaction and 5 to 6 based on DNA hybridization techniques. Of these six, *R. gilardii* is most frequently related to human infections.

Roseomonas spp. considered as opportunistic pathogen with low pathogenic potential for humans, but some species may cause clinically significant or even fatal disease in immunocompromised patients. The natural reservoir for this infection is not known but contaminated water could be the major source [3]. According to literature of *R. gilardii* infections in majority of cases, the initial symptoms were suggestive of bacteremia and associated with the presence of a central line [1]. Other sites of infection have also been reported; respiratory infection, wound infection, osteomyelitis, peritonitis and eye infection [1,4,5]. Underlying disease like, malignancy (most reported), renal disease, inflammatory bowel disease and diabetes are common finding with this infection [1,4,5]. The biofilm production on catheter may be playing an important role in the virulence of invasive infections due to species with a 'mucoid in nature'[6].

The choice of an effective drug for empirical treatment of infections due to *Roseomonas spp*. is sometimes difficult. According to the results of a recent review (De´ et al., 2004), the most active agents against *Roseomonas* species are amikacin and imipenem (99 % susceptibility), followed by ciprofloxacin (90%) and ticarcillin (83 %). Conversely, antibiotics such as third- or fourth-generation cephalosporins are not appropriate for treating infections due to this organism. Susceptibility varies among the different species;

The choice of an effective empirical antimicrobial therapy to the infections caused by *Roseomonas spp*. is sometimes difficult. According to the literature review *R. mucosa* has the higher risk of resistance whereas *R. gilardii* strains are the most susceptible. Rihs et al found that all six species *Roseomonas* genus exhibited >96% resistance to cephalosporins [1]. The most active agents against *Roseomonas* species are Aminoglycoside and Carabapenam. Susceptibility varies among the different species [7].

Conclusion

In conclusion, our case underlines the clinical significance of *Roseomonas* species, particularly in the presence of an indwelling catheter device in patient with malignancy. Microbiologist and Clinician should familiarize themselves with the characteristics of infection with *R. gilardii* because of diagnostic and management implications. Molecular typing by 16S

rRNA gene sequence helps in confirming the phonotypicaly identified strain. It also helps in epidemiological investigation for identifying the source in case of outbreaks. Differences in susceptibility patterns and virulence among the various species highlight the importance of definite identification of *Roseomonas* isolates. Broad-spectrum antibiotics Carbapenems and possibly combination therapy (including an aminoglycoside/ quinolones) should be the first choice for the empirical treatment of *Roseomonas* infections and Cephalosporin should be avoided.

References

1. Rihs, J. D., D. J. Brenner, R. E. Weaver, A. G. Steigerwalt, D. G. Hollis, and V. L. Yu. *Roseomonas*, a new genus associated with bacteremia and other human infections. Journal Clin Microbiol 1993;31:3275-83.
2. Gilardi, G. L., and Y. C. Faur**.** *Pseudomonas mesophilica* and an unnamed taxon, clinical isolates of pink-pigmented oxidative bacteria. Journal Clin Microbiol 1984;20:626-9.
3. Korvick, J. A., J. D. Rihs, G. L. Gilardi, and V. L. Yu**.** A pink-pigmented, oxidative nonmotile bacterium as a cause of opportunistic infections. Arch Intern Med 1989;149:1449-51.
4. Struthers, M., J. Wong, and J. M. Janda. An initial appraisal of the clinical significance of *Roseomonas* species associated with human infections. Clin Infect Dis 1996;23:729-33.
5. Sandoe, J. A. T., H. Malnick, and K. W. Loudon. A case of peritonitis caused by *Roseomonas gilardii* in a patient undergoing continuous ambulatory peritoneal dialysis. Journal Clin Microbiol 1997;35:2150-2.
6. Elshibly, S., Xu, J., McClurg, R. B., Rooney, P. J., Millar, B. C., Alexander, H. D., Kettle, P. & Moore, J. E. Central line-related bacteremia due to *Roseomonas* mucosa in a patient with diffuse large B-cell non-Hodgkin's lymphoma. Leuk Lymphoma 2005;46;611–4.
7. De´ , I., Rolston, K. V. I. & Han, X. Y. Clinical significance of *Roseomonas* species isolated from catheter and blood samples: analysis of 36 cases in patients with cancer. Clin Infect Dis 2004;38:1579–84.