

Roseomonas Gilardi Bacteraemia in a Pediatric Oncology Patient on Chemotherapy: A Rare Case Report

DHRUV KAMLESH MAMTORA, PRITI MEHTA, PALLAVI BHALEKAR

ABSTRACT

Roseomonas is a pink-pigmented, non-fermentative, gram-negative coccobacillus bacterium. Human infections caused by *Roseomonas* are very rare. We describe a rare case report

of *Roseomonas gilardi* bacteraemia in a febrile, neutropenic patient on chemotherapy from oncology unit. The patient responded well to treatment given and was cured of it.

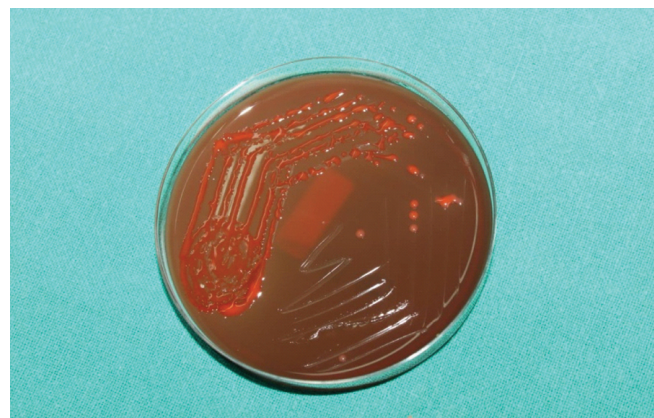
Keywords: Blood culture, Gram negative bacteria, Neuroblastoma

CASE REPORT

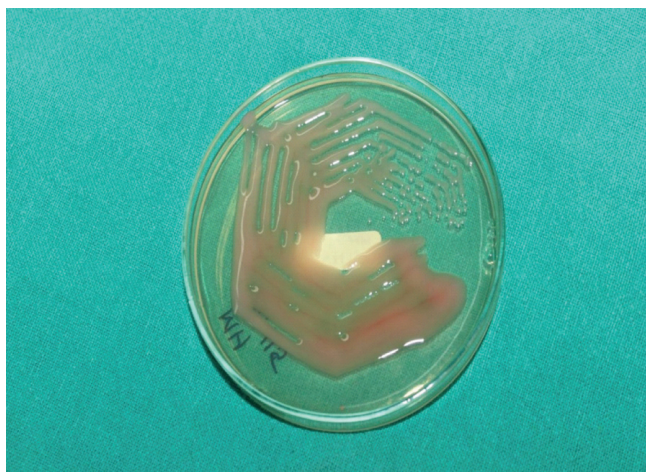
A 10-month-old female child born of second degree consanguineous marriage presented with the chief complaints of fever on and off since 9 months. Child had history of rectovesical fistula and was operated for the same at the age of 7½ months. On clinical examination, the child weighed 7 Kg his height was 66 cm, she was well grown, with pallor and hepatosplenomegaly (3 cm each). CT-scan of chest, abdomen and pelvis revealed a 3.4 × 1.3 × 3.4 cm right paravertebral mass. CT abdomen showed liver mildly enlarged (liver span 9 cm in midclavicular line). Spleen was enlarged in size and measured 7.2 cm in size. Few subcentimeters sized lymph nodes in bilateral inguinal region, largest measuring 6 mm in short axis. NO131 I –MIBG avidity in CT demonstrated right paravertebral mass. Histopathology was suggestive of Schwannian stroma poor undifferentiated neuroblastoma, low MKI index, and unfavorable histology according to INPC classification. MYNC gene amplification was negative. Bone marrow aspiration and biopsy was uninvolved. Hemoglobin electrophoresis of both parents was normal. The child's tumor was staged as stage II and started on COG protocol after parent's consent. Post each chemotherapy cycle the child developed febrile neutropenia with positive blood cultures. First time the blood culture grew MRSA (Methicillin resistant *Staphylococcus aureus*) which was successfully treated. Post 2nd chemotherapy cycle the child developed febrile neutropenia again. CBC was hemoglobin 9.8 gm/dl, WBC 7500 with neutrophils 52% and platelets 330,000.

Blood culture this time grew an unusual organism known as *Roseomonas gilardi*.

Roseomonas gilardi is a pink pigmented gram negative bacteria that has occasionally been isolated from various clinical samples. The cultures were sent by automated blood culture. The gram stain smear of blood culture broth showed gram negative bacilli. Subcultures were done on Columbia sheep blood agar and McConkey's agar as per protocol. After incubation for 24 hours the cultures showed no growth, however after 48 hours of incubation at 37°C, pink pigmented colonies grew on CBA [Table/Fig-1,2]. On McConkey's agar, the growth was scanty and took around 72 hours of incubation. Catalase test was



[Table/Fig-1]: *Roseomonas gilardi* on Columbia sheep blood agar (CBA) plate.



[Table/Fig-2]: Pink red pigmentation and Mucoid character of *Roseomonas gilardi*. The pigment developed after 72 hours of incubation.

positive, and oxidase test was delayed. Organism was non fermentor. On Triple Sugar Iron agar (TSI) and the VITEK 2 Gram negative identification card was identified as *Roseomonas gilardi* with 99% probability and excellent identification. The isolate was susceptible to ampicillin, amoxicillin-clavulenic acid, cefoperazone, gentamicin, tobramycin, amikacin, ciprofloxacin, tetracycline, aztreonam, imipenem and meropenem. It was resistant to cefuroxime, ceftriaxone, ceftazidime and trimethoprim/sulfamethoxazole. The patient responded to treatment with IV amoxicillin clavulanic acid and amikacin as per culture sensitivity reports after obtaining reports for 14 days. The counts normalized, all acute prognostic markers (CRP) levels came down and patient was discharged. Patient had completed chemotherapy on 17th February 2016 and is in remission with monthly follow-up.

DISCUSSION

In 1984, a new group of unnamed pink-pigmented non fermentative bacteria that phenotypically resembled *Methylobacterium extorquens* (*Pseudomonas mesophilica*) was described by Gilardi and Faur [1]. "Pink coccoid" group was term coined by the Centers for Disease Control and Prevention (CDC) to refer to this collection of phenotypically related organisms [2]. The genus *Roseomonas* was named in 1993 by Rihs et al., on the basis of DNA hybridization of pink pigmented gram negative bacteria [3]. This genus includes *Roseomonas gilardi*, *Roseomonas cervicalis*, *Roseomonas fauriae* (*Roseomonas* genomospecies 1, 2 and 3 respectively) and 3 unnamed *Roseomonas* genomospecies 4, 5 and 6. They have been isolated from the aquatic environment. The organism have been isolated from blood, wound, urinary and respiratory specimens, peritoneal dialysis fluid, corneal scrapings and bones [4,5]. The genus *Roseomonas* has been recently established hence clinical experience with infection caused

by these organisms is relatively limited. Though, *Roseomonas* sp. appears to have low pathogenic potential, some species may cause clinically significant or even fatal disease in immunocompromised patients like those with leukemia, septicemia, cancer chemotherapy and dialysis [5-7]. Present case is in accordance with previous case reports wherein the patients were immunocompromised and the patient was child with poorly differentiated neuroblastoma on cancer chemotherapy. Srifueungfung S et al., described first case from Thailand [8]. First case report of allogenic hematopoietic stem cell transplant associated *Roseomonas* infection was reported from Saudi Arabia [9]. In India, case report of community acquired *Roseomonas* was reported from lung cavities affected by tuberculosis [10]. This is a rare case from India and in pediatric oncology which correlates well with previously published case reports from western countries and a few amongst Asian countries.

CONCLUSION

The case report on *Roseomonas gilardi* causing bacteraemia is rare from Indian subcontinent. Potential clinical significance of pink pigmented, gram negative coccoid, oxidase – positive microorganisms should be known to clinicians, particularly when isolated from blood culture of patients with immunocompromised condition. Also important is case based discussion between oncologist and microbiologist and timely appropriate treatment based on antibiotic susceptibility pattern.

REFERENCES

- [1] Gilardi GL, Faur YC. *Pseudomonas mesophilica* and an unnamed taxon, clinical isolates of pink-pigmented oxidative bacteria. *Journal of Clinical Microbiology*. 1984;20(4):626-29.
- [2] Wallace PL, Hollis DG, Weaver RE, Moss CW. Biochemical and chemical characterization of pink-pigmented oxidative bacteria. *Journal of Clinical Microbiology*. 1990;28(4):689-93.
- [3] Rihs JD, Brenner DJ, Weaver RE, Steigerwalt AG, Hollis DG, Yu VL. *Roseomonas*, a new genus associated with bacteremia and other human infections. *Journal of Clinical Microbiology*. 1993;31(12):3275-83.
- [4] Han XY, Pham AS, Tarrand JJ, Rolston KV, Hesel LO, Levett PN. Bacteriologic characterization of 36 strains of *Roseomonas* species and proposal of *Roseomonas mucosa* sp nov and *Roseomonas gilardii* sub sp rosea sub sp nov. *Am J Clin Pathol*. 2003;120(2):256-64.
- [5] Struthers M, Wong J, Janda JM. An initial appraisal of the clinical significance of *Roseomonas* species associated with human infections. *Clinical Infectious Diseases*. 1996;23(4):729-33.
- [6] Dé I, Rolston KV, Han XY. Clinical significance of *Roseomonas* species isolated from catheter and blood samples: analysis of 36 cases in patients with cancer. *Clinical Infectious Diseases*. 2004;38(11):1579-84.
- [7] Tsai SF, Chen CH, Shu KH, Wu MJ. Peritonitis caused by *Roseomonas* in a patient undergoing automated peritoneal dialysis: case report and literature review. *Internal Medicine*. 2012;51(13):1721-24.

- [8] Srfuengfung S, Tharavichitkul P, Pumprueg S, Tribuddharat C. *Roseomonas gilardii* sub sp rosea, a pink bacterium associated with bacteremia: the first case in Thailand. Southeast Asian J Trop Med Public Health. 2007;38(5):886-91.
- [9] Al-Anazi KA, Al Hashmi H, Abdalhamid B, Al Selwi W, Al Sayegh M, Alzayed A, et al. *Roseomonas* bacteremia in a recipient of an

allogeneic hematopoietic stem cell transplantation. Transpl Infect Dis. 2013;15(4):E144-47.

- [10] Kaore NM, Khan Z, Aher AR, Ramnani VK. Community acquired *Roseomonas* infection in a pre-existing Tubercular lung lesion. Lung India : Official Organ of Indian Chest Society. 2014;31(3):289-92.

AUTHOR(S):

1. Dr. Dhruv Kamlesh Mamtara
2. Dr. Priti Mehta
3. Ms. Pallavi Bhalekar

PARTICULARS OF CONTRIBUTORS:

1. Consultant and Head, Department of Microbiology, S.L. Raheja, A Fortis Associate, Hospital, Mumbai, Maharashtra, India.
2. Consultant Pediatric Oncologist, Department of Pediatrics, S.L. Raheja, A Fortis Associate, Hospital, Mumbai, Maharashtra, India.
3. Microbiology Technical Supervisor, S.L. Raheja Hospital, A Fortis Associate, Mumbai, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Dhruv Kamlesh Mamtara,
S.L. Raheja Hospital, A Fortis Associate, Mahim,
Mumbai-400016, Maharashtra, India.
E-mail: dhruv_mamtara@yahoo.com

FINANCIAL OR OTHER COMPETING INTERESTS:

None.

Date of Publishing: Apr 01, 2017