Case study

A rare case report of *Pseudomonas oryzihabitans* bacteremia from North India in a terminally ill patient

Abstract: *Pseudomonas oryzihabitans* is a gram-negative bacillus usually isolated from cases of bacteremia, CNS infections, catheter associated infections or any device related infections, sinusitis, wound infections, skin infections especially in immunocompromised patients in a hospital settings. Only few cases of bacteremia have been reported due to this rare pathogen. This is a first case report from North India in a terminally ill patient suffering from chronic liver disease. Proper isolation and early initiation of antibiotics as per sensitivity pattern cleared the infection, but later he died due to other complications. The need of automated methods for identification and sensitivity testing limits the reporting of this rare but important pathogen in hospital settings. Detailed research work and studies are needed to better understand this rare pathogen and its clinical manifestations for better outcome

Introduction:

Chromobacterium typhiflavum and *Flavimonas oryzihabitans* are the old names for Pseudomonas oryzihabitans which is a non-lactose fermenting bacterium [1]. It is gram-negative and glucose non fermentative, oxidase-negative, and on agar media it shows typical yellow-pigmented colonies. Paddies presides the good moist environment for its survival, although some cases cultured from equipments which is used in inhalational therapy and hospital sinks [2,3]. In humans, it is an opportunistic pathogen infecting those in an immunocompromised state, such as patients with hematological malignancies or receiving steroid [4]. We are describing here a case of bacteremia with Pseudomonas orhyzihabitans which is a rare pathogen and can cause bacteremia in humans.

Case Presentation:

A 37 year old male patient, resident of Uttar Pradesh, construction contractor by occupation ,alcoholic for 15 years, admitted in our hospital with complaint of, gradually progressive painless abdominal distension followed by yellowish discoloration of eyes and skin associated with dark colored urine for the last 30 days. Patient also complained of black colored stool and bilious vomiting around 7-8 episodes/day with each episode of about 50-80 ml for the last 3 days for which he was admitted in some private hospital for 2 days. History of significant weight loss and loss of appetite in the past 6 months, instead there is no history of pruritus , clay colored stool or hematemesis. Test for hepatitis B surface antigen and HIV were negative and no history of significant liver disease in any family member. On general examination patient was ill looking, vitals within normal limit. On systemic examination abdomen non-tender with generalized distension, shifting dullness present, other systemic examination was normal. On USG abdomen, liver with 15.6 cm coarse echotexture with nodular outlining present, Gallbladder distended and

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thickened echogenic sludge in the lumen, elongated spleen and gross ascites. On routine blood investigation LFT was significantly deranged with total Bilirubin 25.36mg/dl, direct 21.01 mg/dl, ALP and ALT 273 I/U and 156 I/U respectively, Increased prothrombin time 26.7 seconds with INR 2.05, total protein 7.5 mg/dl and albumin 3.77mg/dl. Patient was admitted in intensive care unit (ICU) with a diagnosis of Acute on Chronic liver failure due to severe alcoholic hepatitis and managed with IV antibiotics, Albumin and anti Hepatic Encephalopathy measures and upper GJ endoscopy planned. In view of this he was kept on antibiotics Meropenem 1g iv TDS and antifungal was started based on endoscopic finding. Albumin infusion and other symptomatic and supportive treatment was given, patient also offered emergency option of Living donor liver transplantation (LDLT) but no finance or donor available. despite all measure patient developed progressive sepsis, oliguria and respiratory distress syndrome for which he was ventilated.

His blood culture was sent in a pair of bactec (BACTEC) bottles (1 aerobic, 1 anaerobic) to the microbiology laboratory for further processing. His blood BACTEC culture bottle flagged positive after 24 hours and on direct Gram stain multiple gram-negative bacilli seen, which were then sub cultured on blood and Mac-Conkey agar plates (Fig. 1). Biochemical tests were performed and the organism was catalase positive, non–lactose fermenter, Oxidase negative. Finally, for confirmation and identification of bacteria matrix assisted laser desorption ionization time of flight mass spectrometry (MALDI-TOF MS) was done. Repeat blood cultures were sent on the 16th day to confirm the isolate and prove its pathogenicity in sepsis in the patient. *Pseudomonas oryizihabitans* was again isolated from the blood BACTEC bottles and its role was established in the clinical condition of the present case. Antibiotic sensitivity testing was performed by the Kirby-Bauer disc diffusion method on Mullar-Hinton agar and by Vitek-2 (bioMerieux) system [5]. The isolate was susceptible to Minocycline and Trimethoprim/Sulfamethoxazole (table1). As per sensitivity Levofloxacin was added to his treatment regime following which the patient started showing clinical improvement and his subsequent blood cultures became sterile, however the patient developed invasive candidiasis and he subsequently died of sepsis due to candida blood stream infection.

Disscussion

Pseudomonas oryzihabitans is not a common bacterial isolate for blood. Meningitis and endocarditis coinfection can be present especially in immunocompromised individuals [3,6]. The pathogenicity of *Pseudomonas oryzihabitans* is not very clear, hence the need for adequate information regarding this pathogen is important for clinicians and public health practitioners to manage cases associated with this pathogen, a very few cases has been reported associated with this pathogen. Two cases of bacteremia has been reported by T nei et al in Japan which was associated with immunocompromised condition one was transplant patient and another one was with malignancy [1]. An outbreak was reported by Woo KS et al in 2014 in a Korean hospital due to this bacterium related to contaminated equipments [3]. *Pseudomonas orhyzihabitans* is a novel pathogen causing bacteremia in a hospitalized patient. The present case of Pseudomonas orhyzihabitans in a patient with chronic liver disease who was hospitalized for long time and can have device related infection due to this pathogen. Its pathogenic role in device related infection

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has been studied by some isolated case studies done by Tostewin PM et al , in 1993 ,and Lm S et al, in 1994 when it was known as Flavimonas orhyzihabitans[7,8] . From india one case has been reported in the year 2013 from pune maharastra by Bhatawadekar SM which was Community-acquired urinary tract infection by Psedomonas oryzihabitans [9]. From north india this is the first case report on pseudomonas oryzihabitans causing sepsis in a terminally ill patient.

In conclusion *Pseudomonas oryzihabitans* is rarely isolated in clinical situations unless the patient has an inserted device or is in immunocompromised state. We suggest that it is important to evaluate patient and its environment thoroughly if these bacilli are isolated from clinical specimens. So clinicians and laboratory personnel should be well known about pathogenic role of *Pseudomonas oryzihabitans*.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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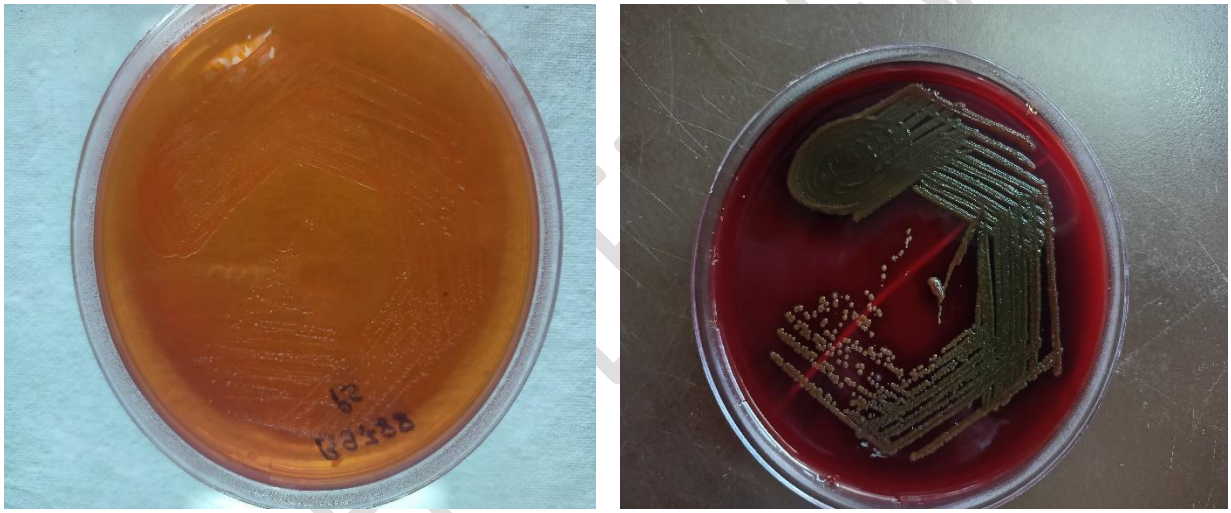

Figure. 1 MacConkey agar and Blood agar plates showing Growth of *Pseudomonas oryzihabitans*

Table. 1 Antimicrobial susceptibility pattern bv Vitek-2 (bioMerieux) system

Antimicrobials	MIC (ug/ml)	Interpretation
Ticarcillin/Clavulanis Acid	>=128	R
Piperacillin/Tazobactam	>=128	R
Ceftazidime	>=64	R
Cefoperazone/Sulbactam	>=64	R
Cefepime	>=64	R
Imipenem	>=16	R
Meropenem	>=16	R

Amikacin	>=64	R
Gentamicin	>=16	R
Ciprofloxacin	2	I
Levofloxacin	2	S
Minocycline	<=1	S
Colistin	>=16	R
Trimethoprim/Sulfamethoxazole	<=20	S

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