International Journal of Medical Science in Clinical Research and Review
Online ISSN: 2581-8945
Available Online at http://www.ijmscrr.in Volume 05|Issue 05 (September-October)|2022|Page: 934-937

Case Report

A Case Report of Ochrobactrum anthropi in a Patient with Systematic Lupus Erythematosus

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Article Received: 07-09-2022 **Revised:** 27-09-2022 **Accepted:** 17-10-2022

ABSTRACT:

Ochrobactrum anthropi (O. anthropi) is a pathogen seen in the hospital environment. They represent hospital-acquired infections in patients with indwelling catheters, drainage tubes, and invasive medical devices. We report a case of nosocomial infection due to O. anthropi and thereby developing a bloodstream infection in a young female with systemic lupus erythematosus (SLE). This case report highlights the clinical and microbiological characteristics of this rare pathogen and thereby the importance of rapid identification and susceptibility testing for the same. Thus, it requires prompt management with appropriate antimicrobial therapy and good infection control practices in the hospital setting.

Key words: Nosocomial infections, Systemic lupus erythematosus (SLE), Ochrobactrum anthropi, bloodstream infections.

INTRODUCTION:

Ochrobactrum anthropi, formerly classified as CDC group Vd, belongs to the Brucellaceae family. The clinical isolates have primarily isolated Ochrobactrum anthropi, Ochrobactrum intermedium, and Ochrobactrum pseudo intermedium from the genus Ochrobactrum. Ochrobactrum anthropi is seen routinely as an opportunistic and nosocomial pathogen. The key characteristics of this pathogen are gram-negative, motile, non-fermenting bacillus with strict oxidative metabolism and non-fastidious [1]. Ochrobactrum anthropi was initially found in the human body as an opportunistic pathogen and it has been a common component of the normal bacteria flora of the human large intestine [2] Ochrobactrum anthropi is considered a pathogen in hospitals because it has a presence in water sources like normal saline, antiseptic solutions, dialysis fluids, and invasive medical devices. It also has the ability to adhere to various synthetic materials.[3] In a healthy host, O. anthropi is being increasingly recognized, even though it is an opportunistic infection in a person with a low immune system [4.] We report a case of Ochrobactrum anthropic infection in a young adult female with systemic lupus erythematosus (SLE).

CASE REPORT:

An 18-year-old female came to Emergency Room with complaints of generalized abdominal pain (acute in severity), multiple episodes of vomiting and constipation for 5 days. On physical examination there was a clinical suspicion of intestinal obstruction. This was followed by a subsequent USG study showing-free fluid in the abdomen, bowel loops dilated and sluggish peristalsis. CT abdomen & pelvis with contrast confirmed the diagnosis of subacute intestinal obstruction due adhesions/stricture in the mid to distal ileum. The complete blood count revealed increased neutrophils and decreased lymphocytes. An emergency laparotomy with excision of Meckel's diverticulum was performed on the above case of sub-acute intestinal obstruction. Patient was shifted to post-operative surgical ICU after an uneventful surgery. Post-surgery empirical therapy given were Meropenem, Amikacin and Metronidazole. On post-operative day 0 patient developed seizures for which antiepileptics were started, MRI brain was normal and patient had no previous history of seizures. Since the patient developed fever, blood cultures were sent to rule out blood stream infections. Blood cultures was flagged positive on Day 1 and was cultured and grew the organism identified as Ochrobactrum Anthropi by BD Phoenix (automated). The definitive antibiotic

therapy given to the patient after the antibiotic sensitivity report were Meropenem and Teicoplanin for the next seven days. Patient developed hypokalemia on post- operative day 4 for which potassium chloride was given. Post-operative day 5 patient continued to have severe hypokalemia (2.5 mEq/L) with respiratory alkalosis. The patient developed bilateral pleural effusion and mild ascites which was confirmed on chest CT. Cultures of pleural fluid and ascitic fluid grew no organism. However, serum C3 (22mg/dL), C4 levels (5mg/dL) were low giving rise to clinical suspicion of autoimmune disease. The histopathology report of the Meckel's diverticulum was not suggestive of any growth/ perforation. The ascitic fluid was further sent for AFB-Expert and found to be negative. On post-operative day 7 patient was diagnosed with systemic lupus erythematosus (SLE) with Lupus nephritis considering the laboratory results [Anti-Nuclear Antibody(ANA)- 1:1000; DNA(Double Strand) Antibody NcX- 190.90IU/ml; Sm Antibody IgG- >200RU/ml; RNP Sm Antibody IgG- >200RU/ml; U1-snRNP IgG antibodies- 158 EliA U/mL; Lactate Dehydrogenase(LDH)- 1092] In addition to the current therapy (antiepileptics, antibiotics) corticosteroids, immunoglobulins, anti-hypertensive and diuretics were started. She was treated thereafter for SLE and Lupus nephritis.

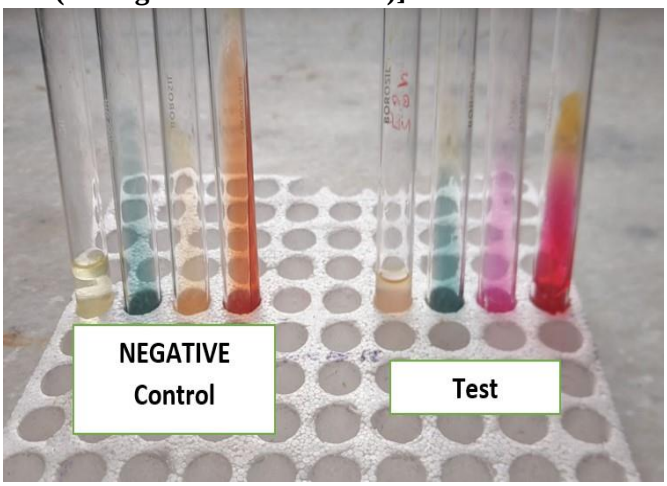
Laboratory findings

The paired blood culture bottles were placed in the BD BACTEC automated blood culture system and was flagged positive after 24 hours of incubation indicating the presence of growth. Gram staining confirmed Gram-negative bacilli. Further, the bottle was removed and the sample was streaked over the culture plates of MacConkey Agar and Blood agar. After 24 hours of incubation at 37˚C, the MacConkey plates showed pale lactose fermenters (Figure1) and the blood plates showed circular convex entire moderate smooth mucoid non-pigmented opaque (non-hemolytic) grey white colonies.

[Figure 1: Non-Lactose fermenting colonies on MacConkey Agar plate]

The organism was isolated from the Blood agar plate and dissolved in the prepared ID broth with a turbidity of 0.5 MacFarland standard and inserted in the BD Phoenix panel with an AST-S broth indicator and placed inside the BD phoenix machine. After 24 hours the culture grew the organism Ochrobactrum anthropi with the according Antibiotic sensitivity test results. Further, the confirmatory test of the organism was done manually by various biochemical test showing Indole test – negative; Citrate test- negative; Urease test- positive and Triple Sugar Iron test - absence of fermentation of sugars (K/K) (Figure 2). Oxidase test showing positive results indicating the presence of cytochrome oxidase enzyme by the organism. Motility test showed that the organism is motile.

[Figure 2- Negative Control (Left to right)- Indole test, Citrate test, Urease test, Triple sugar Ion test (TSI); Test (Left to right)- Indole test (negative), citrate test (negative), Urease test (positive); TSI test (No sugars fermented K/K)]



DISCUSSION:

O. anthropi is a gram-negative, low-virulent, motile, non-fermentative, oxidase-positive, and urease-positive, aerobic bacillus widely seen in environmental sources. This organism rarely causes human infection, but it appears to be an opportunistic pathogen when associated with the implantation of intravenous catheters or other foreign bodies in susceptible hosts, and it has a higher affinity for adhering to foreign objects.[5] It is a nosocomial pathogen causing serious, life-threatening infections in young adults with trauma [5] In a case of pancreatic abscess in an immunosuppressed patient, O. anthropi was reported first. In our study, bloodstream catheter-related infections were the most common [6, 7] In addition to the occurrence of catheter-related infections, the O. anthropi pathogen may cause the following infections

in humans: pyogenic infections [8], meningitis [9],osteomyelitis of bone following implantation of contaminated allograft tissue [10] ,endophthalmitis post vitreous and cataract surgery [11, 12] and infective endocarditis [13, 14] Contaminated fluids were also reported as the likely source of infection in a few cases [15]. Arora et al. reported a case of O. anthropi septicaemia in a cardiac care unit in an older patient with cardiovascular disease and severe left ventricular dysfunction [3]. Similarly, catheter-associated bacteraemia caused by O. anthropi was reported in a three-year-old girl with retinoblastoma in the Ciesalk et al. study. [16] In Yu et al.'s study, the clinical characteristics of 15 cases of O. anthropi bacteraemia were studied, and they concluded that all patients had severe underlying disease and represented primary O. anthropi bacteraemia [17] A case of life-threatening septic shock was reported after the administration of a peripheral venous infusion solution contaminated with O. anthropi. In Braun et al.'s study, O. anthropi was the etiological agent causing endophthalmitis complicating cataract surgery and was treated by removing the intraocular lens [18] Ochrobactrum anthropi has shown susceptibility to the following antibiotics: trimethoprim-sulfamethoxazole, gentamicin, amikacin, imipenem, and tetracycline. They are resistant to beta-lactam antibiotics such as amoxycillin-clavulanate, piperacillin-tazobactam, cefotaxime, ceftriaxone, and aztreonam [19]. In this case report, our isolate was sensitive to imipenem, meropenem, and trimethoprim-sulfamethoxazole while resistant to amikacin. Gentamycin, cefepime, cefuroxime, ceftazidime, aztreonam, amoxicillin-clavulanate, piperacillin-tazobactam. Ochrobactrum anthropi is an opportunistic nosocomial pathogen, found in our case to be from a hospital water source, resulting in an early colonizer of indwelling catheters [20] Therefore, rapid diagnosis and appropriate therapy along with the strict implementation of hospital infection control practices are key prerequisites for the successful management of this pathogen.[21]

CONCLUSION:

This is the first reported case of Ochrobactrum anthropi in an SLE patient with no underlying co-morbidity. The case does show a typical presentation of the infection and highlights the importance of rapid isolate identification, susceptibility testing, treatment with the right antibiotic, and infection control practices. The case also highlights the importance of effective communication practices between the microbiologist team and clinicians in managing O. anthropi and its unique antibiotic susceptibility profiles in hospital-acquired infections.

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