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Isolation of Burkholderia cepacia in an immunocompetent patient – A rare case report in rural tertiary care hospital.

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ABSTRACT-Burkholderia cepacia is known as the Burkholderia cepacia complex (BCC), which consists of extremely virulent pathogenic organisms. It is most frequently documented in immunocompromised patients, particularly in cystic fibrosis patients. In this case report, we describe a rare instance of Burkholderia cepacia in a female who was an immunocompetent patient, initially presented with acute kidney failure and subsequently developed septicemia.The organism was isolated from her blood culture, which she might have acquired from her work place being a farmer. She was treated successfully and discharged after negative blood culture.

KEY WORDS-Burkholderia cepacia, immune competent, Catheter associated blood stream infection, rare case

I.INTRODUCTION

Burkholderia cepacia complex[BCC] is an aerobic,gram-negative bacillus that does not ferment lactose and is catalase negative.[1] It was found in nature from onion bulbs in 1950 and was originally believed to be Pseudomonas species.[2]They are the colonizer and have been identifiedin respiratory tracts of humans who have cystic fibrosis and chronic granulomatous disease with high morbidity and mortality rates due to multidrug resistance.[3]

The intrinsic resistance is caused by mechanisms such as altered penicillin binding proteins, altered multidrug efflux pumps, altered lipopolysaccharide structure, and is also closely related to the formation of biofilms.[4]

It causes opportunistic infection that affects people who areimmunocompromised and has been linked to epidemics in ICU settings.[5] Rarely have reports of this bacteria infecting animmunocompetent host had been made.Thus, we present this rare case of Burkholderia cepacia in non-cystic fibrosis, immunocompetent patient who was been receiving high dose of non-steroidal anti-inflammatory drugs (NSAIDS) admitted at our rural hospital.

II.CASE REPORT

A 52-year-old female who worked as a farmer in the south of India routinely used NSAIDS over the course of a year to treat chronic knee pain. She was brought to the emergency room withfatigue, a low grade, intermittent fever that had been present for 15 days,low back pain,increasing shortness of breath and decreased urine outputwho had a habit of addiction to betel nut chewing and no known co-morbidities.

Examination revealed, patient to be moderately built, dyspneic with bilateral pitting pedal edema, bilateral lumbar tenderness with her vital parameters to be BP: 130/60mmhg, RR:26/min, PR:90/min, SpO2 was 85% on room air, T:99.5^0 F with wheeze and crepitation on auscultation along with bilateral lumbar tenderness. Other systems were unremarkable.Initial lab investigations depicted with ABG:respiratoryalkalosis with metabolic acidosis,Hb:10.8g/dl, TC: 10.45/µL, Serum urea: 64mg/dl, Serum creatinine: 4.5mg/dl, Serum potassium: 6.1mmol/L, urine routine: normal. Chest X-ray showed increased broncho vascular markings bilaterally.

Patient was transferred from casualty and admitted in ICU, placed on BiPAP, started on Injectable Cefoperazone&Sulbactam 1.5g, Rantac 50mg, Emeset 4mg, Sodium Bicarbonate 1amp and provisionally diagnosed to have Acute kidney injury. After receiving the consent of the patient and attender she was taken up for emergency dialysis with Internal Jugular Vein (IJV) catheter.Hemodialysis was carried outwith three cyclesbeing completed; patient was discharged on request.

After two days she was re-admitted in ICU with high grade fever-T:104.5^0 F, BP: 100/60mmhg, PR:120/min, vomiting, irritation, fatigue with Serum creatinine 4.2mg/dl, Serum potassium: 5.5mmol/L, TC: 16.5/µL, procalcitonin:

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52.45ng/ml & CRP: 118mg/dl, Fever profile [dengue,malaria,widal] was negative, Urineand blood culture were sent. She was rediagnosed to have sepsis with acute renal failure.

The Microbiological laboratory which received the blood culture from IJV catheter site was performed in BD BACTEC^{TM} FX 40 (Biomerieux) and TTP was 15hours and 8 mins which was further culturedfor 18-24 hours at 37^0 Cin which blood agar demonstratednon-hemolytic, typical large, circular, low convex, moist colonies[Figure 1],non-lactose fermenting colonies which were 0.5 - 1 mm in sizeon MacConkey agar[Figure 2]and also with unusual purple colored pigmented colonies were noted in both the solid medium. Gram negative bacilli were observed in gram stain.The bacilli were motile, oxidase and catalase test were positive. Urine culture which was sent were negative.

Figure 1: Blood Agar:Non-hemolytic colonies with purple-colored pigment.

Figure 2: MacConkey agar:unusual purple-colored pigmented colonies.

The biochemical test [Figure 3] results were Indole: produced, Citrate: utilized, Urease: not hydrolyzed, Triple sugar iron (TSI): alkaline/acid(K/A) with H2S production, Mannitol:motileand non-fermented, Phenylalanine deaminase (PDA): negative, growth at 42^0 C. It utilized Glucose, lactose, mannitol & maltose oxidatively. Lysine decarboxylated, Arginine not dihydrolased & Ornithine not decarboxylated [Figure 4]. The isolates were confirmed by VITEK 2 compact system (biomerieux).

Figure 3: Biochemical Reactions: Indole-produced, Citrate-utilized, Urease-not hydrolyzed, TSI-K/A with H2S production, Mannitol- motile and non-fermented, PDA-negative

Antibiogram of the isolate was performed in accordance with Clinical Laboratory Standard Institute (CLSI) guidelines by Kirby Bauer Disc Diffusion Methodinon Muller Hinton Agarand also by automated methods[VITEK 2 compact system] which exhibited being Sensitive to Ceftazidime, Ceftazidime/Clavulanic Acid,Ceftriaxone, Cefepime Piperacillin/ Tazobactam, Meropenem and was found resistant to Amikacin, Gentamycin, Cephalexin, Tetracycline, Cefoperazone / Sulbactam, Cefuroxime and Intrinsic resistant to Polymyxin B.

Figure 4: Sugar fermentation test profile:Glucose, lactose, mannitol, maltose utilized oxidatively and Lysine decarboxylated.

According to the Antimicrobial Susceptibility testing[AST] report, the prescribedantibiotic was altered to IV Meropenem 1g and Piperacillin/Tazobactam 2.25g along with other supportive treatment. She responded clinically within 3 days of antibiotics change with resolution of toxemia. Injectable antibiotics continued for a 2 weeks period. Serial monitoring of blood investigations was carried out with reduction in serum creatinine,potassium levels and repeated blood culture was negative. Shemade a complete clinical recovery and was hemodynamically stable,at the time of discharge.

After a month of follow-up, patient was weaned off from dialysis.

III.DISCUSSION

As previously mentioned, Burkholderia cepacia, a member of the proteobacterium subgroup, is widely distributed in the environment and has been isolated from soil andwater. Burkholderia cepacia complex can often be found in hospital water sources. Meanwhile, it can endure in the presence of some disinfectants. [4,6,7]

De A, et al in their study state that B.cepacia increases death and disability in hospitalized patients as a result of its capacity to grow rapidly in a variety of conditions.[7]BCC is a collection of genetically different but phenotypically related bacteria. Identification of the flagellin glycosylation pathway in Burkholderia cepacia and the role of glycosylated flagellin in evading innate immune responses in humans are used to describe pathogenesis. Flagella are essential for the development of biofilms as well as for invasion and attachment to epithelial cells. Toll-Like Receptor 5 (TLR5)-mediated recognition of flagellin exacerbates lung epithelial inflammatory responses.[8]

In review of medical literature only few cases of Burkholderia cepaciain immunocompetent, non-cystic fibrosis patient has been reported. [8,9] Being a farmer with no known comorbidities, our patient would have come into contact with the bacteria from the soil debris, making her more susceptible to the infection.

IV.DRAW BACKS

Since this is a single case report, a further extension of the study using molecular methods for detection involving a case series of additional isolateswill be undertakenin future.

V.CONCLUSIONS

Our case report raises concerns regarding Burkholderia cepacia in a patient who was initially diagnosed with acute kidney injury and initially prescribed inappropriate antibiotic without a report of their antimicrobial susceptibility. This made her underlying condition worse and led to the development of B. cepacia infection in the blood culture obtained from the IJV catheter, resulting in catheter-associated blood stream infection in the patient, who was immunocompetent and free of cystic fibrosis.She responded well when the continuing antibiotic was adjusted in accordance with the AST report.When an infection is present, the results of culture and susceptibility testing help clinicians make the right medical decisions about the infection's cause, management, and prescription of antibiotics. B. cepacia must therefore be treated early and effectively to prevent fatality.

ETHICAL CLEARANCE

Approval of the study taken from Institutional Ethics Committee.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil

CONFLICTS OF INTEREST

There are no conflicts of interest.

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REFERENCES:

[1]. Baul SN, De R, Mandal PK, Roy S, Dolai TK, Chakrabarti P. Outbreak of Burkholderia Cepacia Infection: A Systematic Study in aHematolooncology Unit of a Tertiary Care Hospital from Eastern India. Mediterr J Hematol Infect Dis. 2018 Sep 1;10(1).

[2]. Koo J, Deans GD. A Rare Case of Burkholderia cepacia Complex Septic Arthritis. Case Rep Infect Dis. 2018 Sep 16(3).

[3]. Karanth SS, Regunath H, Chawla K, Prabhu M. A rare case of community acquired Burkholderia cepacia infection presenting as pyopneumothorax in an immunocompetent individual. Asian Pac J Trop Biomed. 2012 Feb;2(2):166-8.

[4]. Gangaram U, Ramya T, Jithendra K, Mohan DR. Burkholderia cepacia an emerging cause of septicemia, in an intensive care unit from a tertiary care hospital, Nellore, India. Int J Adv Med 2020; 7:413-7.

[5]. Meena S, Bir R, Sood S, Das BK, Kapil A. Emergence of Burkholderia cepacia in ICU Setting. Indian J Crit Care Med 2019;23(9):423–426.

[6]. Winn W, Allen S, Janda W, Koneman E, Procop G, Schreckenberger P,Woods. Colour Atlas and Textbook of Diagnostic Microbiology. 7th edition. Philadelphia, USA.Lippincott, Williams & Wilkins; 2006;351-353

[7]. De A, Shastri JS, Malak NI, Kedia M, Sisodia H. Unusual Violet Coloured Pigment Produced by Burkholderia

cepacia Complex – A Report of Five Cases from a Tertiary Care Hospital in Mumbai. J Med Sci Health 2022; 8(2):173-176.

[8]. Ranjan R, Chowdhary P, Kamra A. Community Acquired Burkholderiacepacian Bacteraemia Presenting as MODS in an Immunocompetent Individual: An Unusual Case. J Clin Diagn Res. 2017 Mar;11(3)

[9]. Nittala R, Behera MK, Panigrahy R, Narayan J, Mishra D, Singh A, et al. Burkholderia cepacia causing liver and splenic abscess: Two case reports. Indian J Pathol Microbiol 2023; 66:171