Microbes and Infectious Diseases 2021; 3(2): 296-299

Microbes and Infectious Diseases

Journal homepage: https://mid.journals.ekb.eg/

Case report

Sphingomonas paucimobilis septicaemia in a tertiary care hospital in Nigeria: A case report

Chioma S. Osuagwu [1,3], Rita O. Oladele [1,3], Sunday I. Omisakin [2], Oluwadamilola O. Apanisile [3], Makinwa J. Olajumoke [3], Bassey Ewa Ekeng [*3,4]

1- Department of Medical Microbiology and Parasitology, College of medicine, University of Lagos, Lagos, Nigeria.
2- Department of Obstetrics and Gynecology, Lagos University Teaching Hospital, Lagos, Nigeria.
3- Department of Medical Microbiology and Parasitology, Lagos University Teaching Hospital, Lagos, Nigeria.
4- Department of Medical Microbiology and Parasitology, University of Calabar Teaching Hospital, Calabar, Nigeria

CASE REPORT INFO

Case Report history:
Received 1 August 2021
Received in revised form 10 September 2021
Accepted 18 September 2021

Keywords:
Pathogen
Opportunistic
Septicaemia
Immunocompetent
Vitek 2

A B S T R A C T

Sphingomonas paucimobilis is an opportunistic pathogen that occurs naturally in the environment. It has been implicated in both community acquired and healthcare associated infections. *Sphingomonas paucimobilis* septicaemia is commonly associated with contamination from the environment, the use of hospital and laboratory equipment, indwelling urinary catheters and intravenous cannula. Literature search for *Sphingomonas paucimobilis* septicaemia revealed several case reports documented globally with only a single case report from Nigeria detected by VITEK 2. We report a case of *Sphingomonas paucimobilis* septicaemia in 38-year-old unbooked 21 woman, P1+2(1A), admitted into the accident and emergency unit of Lagos University Teaching Hospital, Lagos, Nigeria, with complaints of fever, abdominal pain and distension, generalized body pain and difficulty in breathing, of six days post Caesarean section. Blood culture yielded *Sphingomonas paucimobilis*. Antibiotics were commenced at admission and exploratory laparotomy done seven days post presentation. However, patient died on day fourteen due to cardiopulmonary arrest.

Introduction

Sphingomonas paucimobilis (S. paucimobilis) initially known as *Pseudomonas paucimobilis*, was placed into its own genus Sphingomonas in 1990. Other sphingomonas spp. of clinical importance includes *Sphingomonas mucosissima* and *Sphingomonas adhesiva* [1,2]. The name "paucimobilis" derives from the fact that few bacteria are motile in broth culture [1]. It is widely found in the natural environment and has been isolated from water, soil, and from hospital equipment such as ventilators, nebulizers and laboratory equipment [1-4]. Indwelling catheters and intravenous cannula have also been identified as sources of infection [1-4]. Additionally, the use of contaminated solutions like distilled water, hemodialysis fluid and sterile drug solutions has also been implicated in *S. paucimobilis* infections [1-4]. This may be explained by the ability of *S. paucimobilis* to pass through the 0.2µm filters that are used for the terminal sterilization of several medicinal products [1,2]. *Sphingomonas paucimobilis* possesses two different kinds of sphingolipids where its name is derived, ubiquinone 10 (Q-10) and 2-hydroxymyristic acid (2-OH C14:0) [1]. It is a yellow pigmented, aerobic, non-lactose fermenting Gram-negative rod with a polar flagellum [1,5]. It can be cultured on blood and

DOI: 10.21608/mid.2021.93734.1190
* *Corresponding author:* Bassey Ewa Ekeng
E-mail address: basseyewaekeng@gmail.com

chocolate agar, but not on MacConkey or media selective for enterobacteria. It grows optimally at 30°C, and also grows at 37°C. It is both oxidase and catalase positive [1,6]. *Sphingomonas paucimobilis* infection may be community or hospital acquired [2,6,7]. Globally, a variety of infections in humans, including pneumonia, meningitis, blood stream infections, mastoiditis, peritonitis, osteomyelitis, septic arthritis, endophthalmitis, empyema, splenic abscesses, urinary tract infections, and biliary tract infections have been associated with *S. paucimobilis* [2,6,7]. To the best of our knowledge, only a single case of *S. paucimobilis* human infection has been reported in Nigeria [7]. We report a case of *S. paucimobilis* infection in a patient at the Lagos University Teaching Hospital, Lagos, Nigeria.

Patient and observation

A 38-year-old unbooked woman, P1+2(1A), admitted into the accident and emergency unit of Lagos University Teaching Hospital (LUTH), Lagos, Nigeria, with complaints of fever, abdominal pain and distension, generalized body pain and difficulty in breathing, all of six days post emergency Caesarean section. The emergency Caesarean section was done at a peripheral private clinic on account of cephalopelvic disproportion secondary to fetal macrosomia and a live male baby of 4.5kg was delivered. Fever was high grade, continuous, associated with chills and rigors, and temporarily relieved with non-steroidal anti-inflammatory drugs. Abdominal pain was colicky, excruciating, and associated with abdominal distension. There was nausea, three episodes of bilious, non-bloody vomiting with copious effluent and constipation. No reduction in urine volume was noted. Difficulty in breathing was of abrupt onset and not associated with cough, chest pain or calf pain. Patient is not a known asthmatic, diabetic, hypertensive, nor a retroviral disease patient. She had 2 doses of tetanus toxoid in pregnancy. She had pregnancy induced hypertension in labor. Blood group and genotype were unknown at presentation. No history of blood transfusion or previous hospital admission, no history of drug allergy, married in a monogamous family, doesn't smoke cigarette or drink alcohol. Physical examination showed an acutely ill looking young woman, obese, conscious, mildly pale, anicteric, febrile (T-39o), tachypneic, acyanosed, dehydrated with bilateral pitting pedal edema up to the mid shin. Urethral catheter was insitu draining about 800ml of coke colored urine. Pulse rate was 122 beats per minute, blood pressure; 150/87 mmHg, respiratory rate was 36 cycles per minute with SPO2 of 93% in room air and 99% in O2 via face mask 8L/min. Breath sounds were vesicular. Abdomen was grossly distended with generalized tenderness, Pfannenstiel scar sutured with nylon, raw flesh seen with minimal discharge and soaked wound dressing. Organs could not be palpated due to tenderness. Vaginal examination showed normal vulva, normal lochia, cervix couldn't be reached bimanually. A diagnosis of puerperal sepsis in an unbooked post Caesarean sectioned woman was made. Samples including blood for culture was collected and IV ceftriaxone 2g daily, IV levofloxacin 500mg daily and IV metronidazole 500mg 8 hourlies were commenced. Other medications were IV paracetamol, 1g 8 hourly, subcutaneous clexane, 100mg daily and IM Arthemeter, 160mg daily, for three days. Wound dressing was done twice daily. Abdominal ultrasound scan done at admission revealed intraabdominal fluid collection suggestive of sepsis or perforated viscus. Abdominal X -ray done at the supine and erect position showed dilated gas filled bowel loops. Laboratory findings showed total white blood cells of 15.43 X 109/L, neutrophil of 81.1%, lymphocytes of 10.1% and platelets of 206 X 109/L; random blood sugar of 8.6mmol/l, hemoglobin; 13.4g/dL. Abdomino–pelvic CT scan done on the fourth day of admission showed multiple intraabdominal and pelvic abscess with myometrial abscess in lower uterine segment. High vaginal swab and urine culture yielded no growth of organisms. Patient condition was observed to have worsened by the fifth day of admission with persistence fever (39.1oC) and IV meropenem 1g 8hly was added to her antibiotic regimen while ceftriaxone was discontinued. Patient was also placed in 'thromboembolism deterrent' stockings. On day seven, of admission, surgery was done under general anesthesia, which lasted two and a half hours; 2 unit of blood was transfused intra operatively. Intra operative findings revealed 5L of purulent fluid and a foreign body (abdominal mop), necrotic spot over the lower uterine segment repair, pyogenic membrane on the peritoneal cavity, inter looped pockets of abscess and subcutaneous abscess at the anterior abdominal wall. She was transferred to ICU unextubated for post-operative mechanical ventilation, noradrenaline was given at 0.2ug/kg/min and intravenous fluids, 4.3% dextrose saline to alternate with 5% dextrose water, 4hourly. Post-operative PCV was 37.3%. Serum electrolyte,

urea and creatinine done on day eight showed Sodium: 150 mmol/L, Potassium: 5.1mmol/L, Bicarbonate: 19 mmol/L, Urea: 11.1 mmol/L and Creatinine: 128.6 mmol/L. Diagnosis was reviewed to Puerperal sepsis complicated by acute kidney injury on account of raised creatinine values. Blood culture retrieved on day eight yielded *S. paucimobilis* sensitive to ertapenem, tigecycline, meropenem, levofloxacin, ciprofloxacin, piperacillin/tazobactam, Augmentin; intermediate to amikacin and resistant to ceftriaxone. Patient became unconscious on day 11 and died on day 14 due to cardiopulmonary arrest.

Laboratory procedure

Blood culture was done using Bact/Alert 3D blood culture system. Broths when subcultured on chocolate agar and aerobically incubated at a temperature of 37°C for 24 hours, yielded growth of greyish colonies measuring about 1mm in widest diameter. Broths subcultured on MacConkey yielded no growth. This is in keeping with the characteristics of *S. paucimobilis* as it does not grow on selective media including MacConkey or on media selective for enterobacteria [1,5]. Gram negative rods were seen on microscopy and were identified by VITEC 2 (bioMerieux, France) as *S. paucimobilis.*

Discussion

Sphingomonas paucimobilis is ubiquitous in nature. Several cases of septicaemia with source of infection from the community or hospital has been documented in literature [2,5,6]. Although generally said to cause asymptomatic infections, few cases of death have been reported [8]. A case report from Indonesia documented mortality from *S. paucimobilis* bacteremia in an immunocompromised patient with poorly controlled diabetes, intubated and put-on mechanical ventilation in the course of management due to respiratory distress syndrome [8]. Our index case wasn't immunocompromised (not diabetic, not on steroids, and HIV negative), but however had other risk factors for *S. paucimobilis* infection. The Caesarean section she had at a private clinic prior to presentation in LUTH, may have been the source of *S. paucimobilis* infection. The performance of this surgery in a sterile environment and adherence to standard precautions is in doubt due to the associated complications (intra-abdominal abscess, foreign body left insitu and wound dehiscence). Other risk factors included (1) IV cannulation (2) Urinary catheterization and (3) The use of ventilator [1-4]. The poor outcome of this case patient may be explained by the delay in evacuating the abdomen of purulent fluid and foreign body, with sepsis complications resulting in multi organ failure.

Sphingomonas paucimobilis isolation rate in Nigeria may not be as low as it appears in literature. Lack of automated systems for blood culture may account for this reason. The case report of hospital acquired *S. paucimobilis* infection by Osuji et. al, 2020, was also identified by VITEC 2 (bioMerieux, France) [7]. Very few tertiary health care facilities in Nigeria have VITEC 2 (bioMerieux, France) currently. We never know how many cases of *S. paucimobilis* septicaemia that may have been discarded as contaminants or misidentified as other organisms.

Conclusion

This is a case of community acquired *S. paucimobilis* septicaemia identified using (bioMerieux, France) VITEK 2. The paucity of information on this pathogen in our locality may be due to lack of automation systems for blood culture and not necessarily low isolation rates. Additionally, because it is not commonly reported as a pathogen, it may be discarded as a contaminant.

Acknowledgement

We like to acknowledge the entire staffs especially the laboratory scientists of the medical microbiology and parasitology laboratory of Lagos University Teaching Hospital, Lagos, Nigeria, for their time and energy put in to identify this organism.

Author Contributions: C.S.O. and R.O.O took part in literature review, writing and review of manuscript. S.I.O conducted a critical review of the manuscript. A.O.O did a clinical summary of patient. M.J.O was involved in laboratory work. B.E.E. conceptualized case report, reviewed literature, and wrote the draft manuscript. All authors have read and agreed to the final version of the manuscript.

Funding: None.

Institutional Review Board statement: Not applicable.

Informed consent statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1- **Ryan M, Butt AA, Adley CC.** *Sphingomonas paucimobilis*. Microbes 2016

2- **Lin J, Lai C, Chen Y, Lin H, Huang C, Chen W.** *Sphingomonas paucimobilis* Bacteremia in Humans: 16 Case Reports and a Literature Review J Microbiol Immunol Infect 2010; 43(1):35–42

3-**Adley C, Ryan M, Pembroke J, Saieb F.** Ralstonia pickettii: biofilm formation in high purity water. Biofilms: persistence and ubiquity 2005: 261-71.

4-**Hussain S, Devers-Lamrani M, El Azhari N, Martin-Laurent F.** Isolation and characterization of an isoproturon mineralizing Sphingomonas sp. strain SH from a French agricultural soil. Biodegradation. 2011; 22:637–650.

5-**Walayat S, Malik A, Hussain N, Lynch T.** *Sphingomonas paucimobilis* presenting as acute phlebitis: A case report. IDCases 2018;11: 6–8

6-**Bayram N, Devrim I, Apa H, Gülfidan G, Türkyılmaz HN, Günay I**. *Sphingomonas paucimobilis* Infections in Children: 24 Case Reports. Mediterr J Hematol Infect Dis 2013; 5(1): e2013040.

7-**Osuji AI, Imaji JE, Olateju EK, Ekele BA, Baamlong N, Tahiru Y.** Hospital-acquired Sphingomonas paucimobilis Infection in a Neonate: A Case Report. JAMMR 2020; 32(7): 42-46.

8-**Lugito NPH, Cucunawangsih, Kurniawan A.** A Lethal Case of *Sphingomonas paucimobilis*. Case Reports in Infectious Diseases 2016; 4.

Osuagwu CS, Oladele RO, Omisakin SI, Apanisile OO, Olajumoke MJ, Ekeng BE. *Sphingomonas paucimobilis* septicaemia in a tertiary care hospital in Nigeria: A case report. Microbes Infect Dis 2021; 3(2): 296-299.