

Rare Case of Neonatal Sepsis by *Achromonas denitrificans*

Dar SA*, Sameen D, Nazir M, Wani WA and Charoo BA

Department of Pediatrics and Neonatology, Sher-i-Kashmir Institute of Medical Sciences, Medical College Hospital, Bemina Srinagar, Jammu and Kashmir, India

Abstract

We report a case of preterm male newborn, admitted with complaint of respiratory distress developing soon after birth and developed clinical features of sepsis on 5th day of postnatal age. The sepsis profile which was initially negative became positive and blood culture showed growth of *Achromonas denitrificans* that was resistant to multiple antibiotics mainly cephalosporins. The neonate was treated with appropriate antibiotics and was discharged successfully. The novelty of the case report is that this is the first case report of neonatal sepsis caused by *Achromonas denitrificans*.

Keywords: Achromonas; Neonatal sepsis; Cephalosporins

Abbreviations: CPAP: Continuous Positive Airway Pressure; INSURE: Intubation-Surfactant-Extubation; WBC: White Blood Cell; ANC: Actual Neutrophil Count

Introduction

Sepsis in neonates is a common phenomenon and is defined as systemic infection occurring in infants at ≤ 28 days of life. It is one of the major causes of mortality and morbidity, particularly in preterm neonates. Although recent advances in neonatal intensive care has decreased impact of sepsis in term neonates, however preterm neonates remain at high risk of sepsis sequel. Neonatal sepsis is classified as early onset sepsis (EOS) and late onset sepsis (LOS) (Occurring within and after 72 hours respectively) [1]. Most common cause of neonatal sepsis is group B streptococcus followed by *E. Coli* and other gram-negative bacteria.

Case Presentation

We report a case of preterm male neonate born via lower segment caesarian section (LSCS) born to a 24 years prime mother at 30 weeks of gestational age, with no significant antenatal and perinatal history. The indication for LSCS was antenatal hemorrhage. Baby was admitted in our NICU at birth with primary issue of respiratory distress and not maintaining saturation off oxygen. Baby was subjected to Chest radiograph which revealed ground glass appearance suggestive of acute respiratory distress syndrome (ARDS). Baby was given rescue surfactant therapy via INSURE technique, and later put on nasal continuous positive airway pressure (CPAP). Base line investigations and septic profile was sent which revealed WBC count of 13.7 thousand, ANC of 6.8 thousand, HB of 17 gram/dl, PLT of 1.8 lakhs/dl, normal CSF study, blood culture, CRP, procalcitonin, KFT and LFT. Baby's blood sugar and serum Calcium were 63 mg/dl and 7.9 mg/dl respectively. Patient was weaned gradually from CPAP and put under oxygen hood on day 4. However, on day 5 baby develop lethargy with increase in respiratory rate and increased requirement of oxygen. Repeat septic workup revealed positive CRP and procalcitonin. WBC and ANC had decreased to 5.1 and 1.1 thousand respectively. X-ray chest now showed perihilar infiltrates in middle zone and blood culture grew *Achromonas denitrificans*. The isolate was resistant to most of cephalosporins, sensitive to meropenem, imepenem, amikacin, levofloxacin, polymyxin and tigicycline. Baby was put on imepenem and amikacin. Baby's clinical status improved with normalization of WBC and ANCs. Patient was weaned off from oxygen after 7th day of antibiotic therapy.

Discussion

Hospital acquired sepsis in preterm neonates is a common entity, however neonatal sepsis by *Achromonas denitrificans* to our knowledge has never been documented before. Neonatal sepsis may be categorized

as early-onset or late-onset [1]. Of newborns with early-onset sepsis, 85% present within 24 hours, 5% present at 24-48 hours, and a smaller percentage present within 48-72 hours [1]. Onset is most rapid in premature neonates [1]. In our case *Achromonas denitrificans* was detected on 5th day of admission thus late onset and most probably hospital acquired.

A. denitrificans is a gram-negative bacterium previously known as *A. denitrificans* and only recently classified as Achromo-bacter [2]. *A. denitrificans* are mobile, strictly aerobic, ubiquitous bacteria not fermenting glucose, catalase and oxidase positive. These bacteria are present in soil and water and only rarely cause human infections [2]. The micro-organism has been associated with the infusion of contaminated IV solutions or with the use of humidifiers and incubators [3,4]. In our case patient received humidified oxygen via nasal CPAP, was on incubator for warm care, received intravenous fluids, which may have acted as the source of infection.

The identified risk factors for *Achromobacter* infection are: immunodeficiency, HIV infection, malignancy, Cystic fibrosis and hospitalization [5]. In our case immaturity of preterm immune system may have been the risk factor.

Treatment of *Achromobacter pneumonia* depends upon the susceptibility tests. Most *Achromobacter* species isolates have been found to be resistant to first and second-generation cephalosporins, aminoglycosides and narrow-spectrum penicillins; susceptible to sulfonamides, carbapenems, broad-spectrum penicillins, third-generation cephalosporins; and variably susceptible to fluoroquinolones [6]. In our case bacteria was resistant to most of cephalosporins, sensitive to meropenem, imepenem, amikacin, levofloxacin, polymyxin and tigicycline. Baby was treated as per the culture sensitivity and was discharged after 2 weeks of antibiotic treatment.

Conclusion

Achromonas denitrificans is an aerobic, nonglucose fermenter gram-negative bacillus, flagellated and motile and environmental inhabitant and occasionally encountered in causing human infections. There are

*Corresponding author: Dar SA, Department of Pediatrics and Neonatology, Sher-i-Kashmir Institute of Medical Sciences, Medical College Hospital, Bemina Srinagar, Jammu and Kashmir, India, Tel: +917006108395; E-mail: Sheerazdar123@gmail.com

Received December 19, 2018; Accepted December 28, 2018; Published December 31, 2018

Citation: Dar SA, Sameen D, Nazir M, Wani WA, Charoo BA (2018) Rare Case of Neonatal Sepsis by *Achromonas denitrificans*. J Clin Case Rep 8: 1198. doi: 10.4172/2165-7920.10001198

Copyright: © 2018 Dar SA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

only few reported cases of human infections caused by *Achromonas denitrificans* and our case report is 1st of its type in neonates. Despite this rarity its clinical significance lies in the fact of lack of responsiveness to cephalosporins and aminoglycoside antibiotics, both used in 1st line treatment of neonatal sepsis all over the world. So, one should adhere to strict universal aseptic precautions while dealing with preterm neonates.

References

1. Klinger G, Levy I, Sirota L (2009) Epidemiology and risk factors for early onset sepsis among very-low-birthweight infants. Am J Obstet Gynecol 201: 1-6.
2. Coenye T, Vancanneyt M, Cnockaert MC, Falsen E, Swings J (2003) A novel *Alcaligenes faecal* like organism isolated from human clinical samples and reclassification of *Alcaligenes denitrificans* Rüger and Tan 1983 as *Achromobacter denitrificans* comb nov Int. J Syst Evol Microbiol 53: 1825-1831.
3. Weitkamp J, Tang Y, Haas D, Narinder K (2000) Recurrent *Achromobacter xylosoxidans* bacteremia associated with persistent lymph node infection in a patient with hyper-immunoglobulin M syndrome. Clin Infect Dis 31: 1183-1187.
4. Ahmed MS, Nistal C, Jayan R, Kuduvalli M, Anijeet HK (2009) *Achromobacter xylosoxidans*, an emerging pathogen in catheter-related infection in dialysis population causing prosthetic valve endocarditis: A case report and review of literature. Clin Nephrol 71: 350-354.
5. Hansen CR, Pressler T, Nielsen KG, Jensen PO, Bjarnsholt T, et al. (2010) Inflammation in *Achromobacter xylosoxidans* infected cystic fibrosis patients. J Cyst Fibros 9: 51-58.
6. Rolston KV, Messer M (1990) The *in-vitro* susceptibility of *Alcaligenes denitrificans* subsp. *xylosoxidans* to 40 antimicrobial agents. J Antimicrob Chemother 26: 857-60.