

# ***Cedecea neteri* Peritonitis as a Complication of Necrotizing Enterocolitis in a Neonate**

Haider M Arishi, Amal M Daghriri, Fatemah Y Gumairy, Yasser F Ali

Department of Pediatrics and Neonatology, King Fahad Central Hospital. P O BOX 204, Jazan 91991, Saudi Arabia.

## **Corresponding Author:**

Dr. Haider M Arishi  
Email: drarishih@gmail.com

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## **Abstract**

**Background:** *Cedecea neteri* is a gram negative, rod-shaped bacteria that belongs to the family of Enterobacteriaceae. Human infection caused by this organism is rare. *C. neteri* bacteremia has been reported in only few adult patients. **Case Report:** We hereby report *C. neteri* peritonitis in a neonate following intestinal perforation due to necrotizing enterocolitis. **Conclusion:** This is the first case of *C. neteri* reported from Saudi Arabia and to the best of our knowledge, this is the first case in pediatric age group. In future, this organism may assume important place among bacteria causing healthcare associated infections.

**Keywords:** Bacteremia, Necrotizing Enterocolitis, Neonate, Saudi Arabia, Peritonitis.

## **Introduction**

Necrotizing enterocolitis (NEC) is a common and serious gastrointestinal illness in neonates. NEC with a multifactorial etiology, is characterized by variable damage to the intestinal tract ranging from mucosal injury to full-thickness necrosis and perforation. NEC is still major issue in neonatal practice and is increasing in some centers [1]. *Cedecea neteri* is a member of the family of enterobacteriaceae. It is gram-negative, rod-shaped, motile, lipase positive and resistant to colistin and cephalothin [2]. Human infections due to *C. neteri* are rare. All cases reported so far were in adult patients and were blood stream infections. We are report the *C. neteri* infection from Saudi Arabia and to the best of our knowledge this is first patient in pediatric age group.

## **Case Report**

A 15 day-old, male newborn was admitted with refusal of feeding, abdominal distension, vomiting and diminished activity for 2 days. The baby was born at 36 weeks of gestation to consanguineous

parents by low segment cesarean section to a mother who was G5P4+0. The patient was admitted to the Neonatal Intensive Care Unit (NICU) at King Fahad Central Hospital as late preterm baby with mild respiratory distress for initial three days, After improvement, he was discharged on full oral feeds. The baby did well at home for 12 days then he started having vomiting 3-4 times per day. Vomitus was greenish in color, non-projectile and contained milk. Family history was suggestive of Crohn's disease in one of their four children who was 13 years old.

Physical examination revealed a 2.2 kg, hypoactive, sick looking baby, with no dysmorphic features. The pulse was 156 beats per minute, respiratory rate: 44 per minute, SPO<sub>2</sub> 99% in room air and mean blood pressure was 42 mmHg. The abdomen was distended with diminished bowel sounds and no organomegaly. The anterior fontanel was at level, the baby was hypotonic with hyporeflexia. All peripheral pulses were palpable; heart sounds were within normal and no added sounds. Other systems examination was unremarkable. The

initial clinical assessment was possible sepsis and to rule out intestinal obstruction. The patient was kept nil per orally with maintenance intravenous fluids, sepsis work up was done including lumbar puncture. Injectable ampicillin, gentamycin and metronidazole were started. During hospital course, baby continued to have abdominal distension with greenish nasogastric aspiration. On 4<sup>th</sup> day of admission, baby deteriorated clinically, became sicker, lethargic, abdomen was tense and distended. Total leukocyte count was  $3.77 \times 10^9/L$ , hemoglobin: 113 g/L and platelet count:  $54 \times 10^9/L$ . Capillary blood gases showed metabolic acidosis. The cerebrospinal fluid (CSF) analysis was normal for age and CSF culture was sterile. The initial antibiotics were changed to meropenem and vancomycin. Intravenous immunoglobulins were started as well. Because of worsening clinical condition, the baby was intubated electively and connected to ventilator. X-ray abdomen showed free gases in peritoneal cavity. The pediatric surgeon inserted a peritoneal drain which drained 20 ml of peritoneal fluid which was sent for culture. The patient was started on total parenteral nutrition.

On day 6 of admission, no clinical improvement was observed with increased peritoneal drainage and nasogastric aspirate, the decision for abdominal exploration was made on the same day. The operative findings included bowel perforation at recto-sigmoid junction, sigmoid colostomy was performed and tissue sent for histopathology. Peritoneal fluid cultures both on day 4 and 6 grew *Cedecea neteri* which was sensitive to ampicillin, amoxicillin-clavulanic acid, gentamycin, piperacillin and meropenem. Blood culture which was drawn on 4<sup>th</sup> day of admission grew *Enterococcus faecalis*. The antibiotics were changed to piperacillin-tazobactam and gentamycin. The general condition of the patient started to improve and three days after the surgery inotropic support was discontinued.

On 6<sup>th</sup> postoperative day, abdominal drain was removed and peritoneal fluid culture was negative. The patient was extubated and clinically improving. Oral feeding was gradually resumed and tolerated. Blood culture on 4<sup>th</sup> day post-surgery was negative and antibiotics were continued for 14 days. The histopathology of full thickness excised rectal wall showed normal ganglionic segments. The infant was discharged three weeks after surgery on full feeding, with instructions on colostomy care. Outpatient follow up four weeks post-discharge, the baby was well and thriving.

## Discussion

Necrotizing enterocolitis (NEC) is a common and serious gastrointestinal illness in neonates. Farmer *et al.* reported the first invasive disease (bacteremia) in an adult patient with valvular heart disease who had three positive blood cultures for *C. neteri* out of four suggestive of possible endocarditis. The patient made uneventful recovery [3]. The second case was 27 years old female patient with systemic lupus erythematosus who had bacteremia with *Cedecea neteri*. The blood cultures of this patient were positive after 36 days of hospitalization. She was on multiple immunosuppressive drugs. The patient died of septic shock. This infection was considered as nosocomial [4]. Recently a central line related bacteremia due to related strain *C. davisae*, was reported in an adult patient with acute myeloid leukemia [5]. In our case report, *Cedecea neteri* was isolated twice from peritoneal fluid. To the best of our knowledge this is the first case report in pediatric age group. We believe that this case was healthcare associated infection, as the organism was isolated after 48 hours of admission to hospital in a relatively immuno-compromised preterm baby.

## Conclusion

Human infections caused by *C. neteri* are rare. Because of small number of patients reported so far, it is difficult to predict if *C. neteri* infections

will affect the extremes of age and immuno-compromised human hosts or the spectrum of infections may extend to other patients. In three of the four cases reported including our patient, infections were consistent with healthcare associated infections. In future, *C. neteri* may have a place among infections acquired in healthcare settings.

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