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case report

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Received: April 10, 2014. Accepted: September 8, 2014
Published online: December 24, 2014
DOI: 10.7883/yoken.JJID.2014.137

Advance Publication articles have been accepted by JJID but have not been copyedited or formatted for publication.
LACTOCOCCUS LACTIS CATHETER-RELATED BLOODSTREAM INFECTION IN AN INFANT: CASE REPORT

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SUMMARY

Lactococcus lactis is a gram-positive coccus that is nonpathogenic in humans. Herein, we present the case of a one-year-old boy with Down’s syndrome (DS) and Hirschprung’s disease (HD) who developed a catheter-related bloodstream infection (CR-BSI) with L. lactis after gastrointestinal surgery. The patient had been hospitalized in the pediatric surgery unit from birth because of the HD, and he had undergone the Duhamel-Martin procedure which caused recurrent diarrhea episodes and feeding intolerance. On the 430th day of life, the infant had an episode of gastroenteritis and feeding intolerance. Because clinical sepsis was suspected, blood cultures were taken both from the central venous catheter and peripheral vein, and evidence of a growing microorganism was detected in two different central venous catheter blood cultures that were taken two days apart. The colonies were then identified by both the Vitek2 and VitekMS system (bioMérieux) as Lactococcus lactis spp. lactis. Afterwards, we realized that the central venous catheter could not be removed because there was no peripheral venous line, and the patient was subsequently treated successfully with vancomycin. Therefore, even though the
Lactococcus species is generally accepted as being nonpathogenic, it should still be kept in mind as a potential pathogen in infants.

**Key Words:** *Lactococcus lactis*, infant, catheter-related bloodstream infection

Catheter-related bloodstream infections (CR-BSIs) are an important source of morbidity and mortality worldwide. *Lactococcus* spp. are not recognized as important pathogens in humans, but the current literature provides evidence that they can cause infection, particularly in immunocompromised hosts (1). In this case study, we describe the second known case of CR-BSI caused by *L. Lactis* in an infant.

A one-year-old boy with Down’s syndrome (DS) had been hospitalized in the pediatric surgical care unit since birth. Because of vomiting, abdominal distension, and meconium ileus, rectal biopsy was taken 14 days after he was born, and this revealed the absence of ganglion cells in accordance with Hirschprung’s disease (HD). An ileostomy was carried out on his 30th day of life. When the patient was one year old, the definitive Duhamel-Martin procedure was performed. The patient could not be discharged because he required total parenteral nutritional support from a central venous line via an 8 cm Triple-Lumen 5.5Fr. ARROW Catheter inserted into the femoral vein.

On the 430th day of life, the patient had an episode of gastroenteritis along with feeding intolerance, erosive diaper dermatitis, and a worsening clinical condition. He was also hypotensive and hypotonic and he had a subfebrile fever. No pathogenic
microorganisms were found in the stool examination. The laboratory results showed a white blood cell (WBC) count of 14,800/mm³, C-reactive protein levels of 29.3 mg/L (0-5 mg/L). Furthermore, the infant’s urinalysis was normal, and his urine culture remained sterile. Moreover, he had no signs of pneumonia.

Because clinical sepsis was suspected, blood cultures were taken both from the central venous catheter and peripheral vein. Fourteen hours later, the BacT/Alert device (bioMérieux) gave a signal indicating the growth of a microorganism in the catheter blood culture; however, the peripheral vein blood cultures remained sterile. Gram-positive, alpha-hemolytic colonies were seen which were considered to be members of the viridans group streptococci (VGS). These were first detected by the Vitek 2 and VitekMS systems (bioMérieux), and these identified *Lactococcus lactis* spp *lactis* with a reliability of 92% and 99.9%, respectively. Because the peripheral blood cultures were still sterile, the catheter and peripheral vein cultures were repeated, and the same organism was identified. Empirical antibiotic therapy with vancomycin (60 mg/kg/24h: Q6 h) was then started. The antibiogram test results on the second day of antibiotic therapy showed that the microorganism was susceptible to vancomycin, therefore, the antibiotic therapy was continued for 10 days. On the third day of the vancomycin therapy, control cultures were obtained, and they remained sterile. In addition, no vegetations were seen on the heart valves via echocardiography, and the
infant’s clinical condition continued to improve without the removal of the central venous catheter.

*Lactococcus lactis* is a gram-positive bacterium that was originally isolated from milk and plant surfaces, and it is now used in the dairy industry to make cheese and other fermented foods (2). In recent years, there have been case reports of infection with *L. lactis* in immunocompromised adults who presented with endocarditis, liver abscesses, septic arthritis, septicemia, cerebellar abscesses, deep neck infections, osteomyelitis, canaliculitis, and subdural empyema (3,4).

On the other hand, only three cases of infection with the *Lactococcus* species have been reported in infants. The first case involved a 19-month-old immunocompetent female with a brain abscess caused by *L. lactis cremoris* (5). The second case was a newborn who developed bacterial meningitis and septicemia due to *Lactococcus lactis* (6). The third case was a nine-month-old girl who developed catheter-related bacteremia with *Lactococcus lactis* and was treated with vancomycin and cefotaxime without removing the catheter (7). To the best of our knowledge, our patient was the only the second infant who had CR-BSI with *Lactococcus lactis*. Because infections caused by *Lactococcus lactis* are rare, the standard therapeutic regimen has not been well established. Elliot and Facklam investigated the antimicrobial susceptibility between 19 lactococcus species in 1996 and observed no resistance to vancomycin.
However, they found different results when they investigated clindamycin (8). For this reason we continued vancomycin therapy after obtaining the susceptibility results.

The route of *L.lactis* infection is not well understood (6,9). Bacterial translocation from the gut is a common source of bacteremia in patients with short bowel syndrome (10). Our patient was born with DS, which can be attributed to a secondary immunocompromised status. He also had a colonic resection because of HD. These could have been the facilitating factors in this infant even though he was not fed any dairy milk products. Hence, the source of the bacterium in our patient was difficult to pinpoint.

Our patient had been hospitalized since birth, and finding a peripheral vein line was quite difficult. For this reason, we collected only a small blood sample for the peripheral vein culture, which most likely meant that the microorganism would not have been found in those cultures. Moreover, we used a multi-lumen catheter in our patient but could only obtain a blood sample from one lumen. However, because the two blood samples, which were taken from catheter two days apart, yielded the same organism in the first 24 hours, the idea of contamination and colonization had not been at the forefront of our investigation.

We routinely employ both Vitek2 and VitekMS systems to identify and analyze isolates at our hospital, with the latter being used for the accurate and rapid identification of various microorganisms, including viridans *streptococci*, from clinical samples. According to the manufacturer's instructions, a perfect match between the spectrum and the unique spectrum of a single organism or organism group would have a probability of 99.9% [good identification (ID)] (11,12), and our results matched this
criteria.

In view of our patient's poor clinical status, we accepted that the organism was the pathogenic agent.

Even though *L. lactis* is mostly accepted as being nonpathogenic, it should be kept in mind as a potential pathogen in infants with underlying diseases, especially short bowel syndrome.

**Conflicts of interest:** None to declare.

**REFERENCES**


