Findings that shed new light on the possible pathogenesis of a disease or an adverse effect

Acute pyelonephritis and secondary bacteraemia caused by *Veillonella* during pregnancy

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Summary

We report a case of pyelonephritis and secondary bacteraemia caused by *Veillonella* species during pregnancy. *Veillonella* is part of the normal flora from the oral cavity, gut and vagina. However, because *Veillonella* is usually isolated from cultures of clinical specimens as part of commensal flora, it is frequently regarded as a contaminant. In the present case, *Veillonella* was isolated from the patient's urine and blood samples that showed evidence of pyelonephritis and secondary bacteraemia. We found that ureteral stenting is an extremely effective therapeutic option for pregnant woman with hydronephrosis and clear signs and symptoms of urosepsis.

BACKGROUND

This case is unique because it is the first reported case of pyelonephritis and secondary bacteraemia caused by *Veillonella* species during pregnancy.

CASE PRESENTATION

A 21-year-old Japanese woman was referred to the Maternity and Perinatal Care Unit at 36 weeks 6 days of gestation because of sudden severe right flank pain. Her medical history was unremarkable; she did not have any history of flank pain, renal calculi and pyelonephritis. At presentation, she had severe colic pain radiating to the right lower abdomen, with percussion tenderness at the right costovertebral angle, and was initially suspected to have ureteral calculi.

INVESTIGATIONS

Ultrasonography revealed unilateral hydronephrosis on the right side. One hour after admission, the patient's temperature increased to 39.1°C and she experienced chills. The pain worsened, requiring narcotic analgesia. Blood test results showed a leucocytosis of 11 500 cells/mm³. Urine microscopy results showed 5–9 leucocytes and 5–9 erythrocytes per field of vision. The Gram stain of the urine revealed polymorphonuclear leucocytes. Two sets of blood cultures were collected, and antimicrobial therapy was promptly initiated.

DIFFERENTIAL DIAGNOSIS

Acute pyelonephritis, physiological dilation in pregnancy, ureteral calculi, infective endocarditis.

TREATMENT

Therapy with intravenous cefotiam was administered empirically. With progression of the symptoms of urosepsis, we immediately decided to insert a ureteral stent in the patient. A double-J indwelling ureteral catheter was inserted cystoscopically under local anaesthesia. A retrograde ureteral

catheter inserted led to drainage of cloudy urine. Immediately after inserting the catheter, her symptoms ceased. Her temperature decreased to the normal level. Thereafter, she remained well until delivery. We decided to induce labour to prevent complications such as maternal sepsis and a healthy infant was delivered without any complications. Her postpartum course was uneventful. On day 7, a pure colony of a small Gram-negative coccus was observed on the anaerobic culture plate (figure 1). No growth was observed on the aerobic culture plate. The patient received intravenous cefotiam that was administered for 7 days. On day 8, the two sets of blood cultures showed the presence of *Veillonella*, and no bottle cultures yielded aerobes. The blood and voided urine cultures were both positive for *Veillonella*. The urine culture obtained using an open-ended ureteral catheter was positive for *Veillonella* and was sensitive to ampicillin, cefotaxime, clindamycin and imipenem but was resistant to vancomycin. Therefore, the antimicrobial therapy was switched to intravenous ampicillin.

Figure 1 Gram stain of the blood showing Gram-negative appearing in pairs and clusters.

Figure 2 CT image demonstrating ureteral calculi.

Intravenous antibiotics were continued for a 2-week period, during which the patient remained afebrile. On day 9, additional peripheral blood culture was drawn, and it was negative for this organism.

Her fever resolved completely, and she was discharged 15 days after her admission, with pigtail catheters in situ. The catheter was removed 29 days postpartum. After delivery, we detected ureteral calculi via CT (figure 2). Thereafter, spontaneous stone passage was observed. Unfortunately, she failed to catch a stone.

OUTCOME AND FOLLOW-UP

Immediately after inserting the catheter, her symptoms ceased. Her temperature decreased to the normal level. Thereafter, she remained well until delivery.

DISCUSSION

We present a case of pyelonephritis because of *Veillonella* species, which resolved favourably with antibiotic therapy and surgical intervention. *Veillonella* species is part of the normal anaerobic flora of the oral cavity, small intestine, upper respiratory tract and vagina. Asymptomatic bacteriuria due to anaerobic bacteria has been found in 5% of the female population during pregnancy.¹ When isolated from clinical specimens, *Veillonella* is often regarded as a contaminant. However, in situations wherein it is cultured as a single organism and yields a heavy growth in the culture obtained from a patient with symptoms compatible with bacteraemia, it should be considered a pathogen. They often appear in polymicrobial cultures and infrequently grow in blood cultures. In the present case, *Veillonella* was isolated from urine and blood samples that showed evidence of pyelonephritis. *Veillonella* species have been reported to be a rare cause of endocarditis² and pelvic abscesses.³ The most frequently reported *Veillonella* infection is osteomyelitis.⁴ *Veillonella* species has been reported as the sole organism isolated from blood cultures of patients with sacroiliitis⁵ and discitis.⁶ Risk factors for *Veillonella* infection include periodontal disease and immunodeficiency.⁷ However, the patient described in this case report did not have any apparent risk factor. No heart murmurs were present, and there were no peripheral stigmata of infective endocarditis. A careful physical examination showed the patient to have good dentition, without obvious carious lesions, mucositis

or gingivitis. She was haemodynamically stable and there were no other signs of endocarditis. There was no clinical evidence of other foci of infection. Most anaerobic organisms are sensitive to penicillin and cephalosporins. In vitro susceptibility studies suggest that penicillin is the drug of choice for this organism and that cephalosporins may be acceptable therapeutic alternatives. *Veillonella* is susceptible to a variety of antibiotics in vitro, and the outcome for patients who have diseases caused by this organism is generally good although Liu *et al* reported fatal cases of *Veillonella parvula* bacteraemia.⁸ The identification of *Veillonella* isolates to the species level remains problematic, as conventional biochemical testing does not provide adequate discrimination between species. Since genetic methods are not routinely employed in clinical laboratories, more-practical ways to identify fastidious organisms are still required. Commercial kits, such as the Rapid ANA II system (Remel, Inc.), Vitek ANI card (bioMérieux, St. Louis, Missouri, USA), and API 20A (bioMérieux), are available. Direct sequencing of the 16S rRNA gene has been described as the best method for identification of *Veillonella* strains at the species level. In the present case, the original isolate was identified as a *Veillonella* species by the rapid ANA II System. The system provides only a genus-level identification for *Veillonella* species. Anaerobes might also invade the urinary tract through an ascending route by direct extension from adjacent organs such as the uterus or bowel. The clinical significance of symptomatic hydronephrosis during pregnancy is its association with ureteral obstruction, leading to ascending infection, which has the potential for sepsis, threatened abortion or preterm labour. Those with signs of sepsis and obstruction require prompt surgical intervention. Distinguishing a urinary tract obstruction from normal physiological dilation in pregnancy is difficult using ultrasonography because dilatation is usually found in late pregnancy. The cause of hydronephrosis could not be evaluated during pregnancy in the present case. We found that ureteral stenting was an extremely efficient therapeutic option in treating this pregnant woman with hydronephrosis and clear signs and symptoms of urosepsis. This case is unique because it is the first reported case of pyelonephritis and secondary bacteraemia caused by *Veillonella* species during pregnancy. The success of this treatment could be associated with the therapeutic use of antimicrobial agents and surgical intervention.

Learning points

- ▶ Those with signs of sepsis and obstruction require prompt surgical intervention.
- ▶ Ureteral stenting was an efficient therapeutic option in treating this pregnant woman with hydronephrosis and signs of urosepsis.
- ▶ Distinguishing a urinary tract obstruction from normal physiological dilation in pregnancy is difficult.
- ▶ Pyuria is a characteristic feature of inflammation. However, it can be absent if the site of infection is excluded from the normal flow of urine, as is the case with complete ureteral obstruction. An important caveat is that urinalysis entirely normal in patients with obstructed ureter.

Competing interests None.

Patient consent Obtained.

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