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Case Report

Veillonella dispar bacteremia in an elderly patient with urothelial carcinoma: a case report and literature review

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ABSTRACT

Veillonella is a genus of Gram-negative anaerobic cocci. *Veillonella* is typically benign and a normal part of the intestinal and genitourinary flora, however in the presence of certain risk factors such as intravenous drug abuse, malignancy, and immunosuppression, some species belonging to this genus have been reported to cause severe deep-seated infections. *Veillonella dispar* is one of the three subgroups of *Veillonella* species associated with deep-seated human infections. *V. dispar* is reported to be associated with very few diseases, including infective endocarditis, vertebral osteomyelitis, and bacteremia. In this case report, we discuss the case of 89-year-old male with a history of transurethral resection of a bladder tumor who presented with fever, burning micturition, and decreased urine output who was later diagnosed with *V. dispar* bacteremia during his hospitalization, making it the fifth report of bacteremia in the literature. Additionally, we provide a brief literature review on *V. dispar* infections in humans.

Keywords: *Veillonella*, Bacteremia, Malignancy

INTRODUCTION

Veillonella are nonmotile, anaerobic Gram-negative bacteria typically found in the flora of the mouth, gastrointestinal tract, and genitourinary area.[1] As part of the normal flora of humans, *Veillonella* has also been reported to play an essential role in gut homeostasis by producing short-chain fatty acids through lactate fermentation.[2] The *Veillonella* genus comprises 13 species, of which three species, *Veillonella atypica*, *V. parvula*, and *V. dispar*, have been reported to be pathogenic.[3,4] In fact, *Veillonella* has been associated with diverse deep-seated infections, including osteomyelitis, endocarditis, and meningitis.[5] *V. parvula* is the most commonly isolated phenotype. While *V. dispar* has also been reported to cause deep-seated infections, there have been only 4 cases of bloodstream infection of bacteremia due to this organism before our case report.[6] We present a rare case of *V. dispar* bacteremia in an elderly patient with recurrent urothelial carcinoma.

CASE REPORT

This is the case of a 89-year-old man with a past medical history of atrial flutter (not on anticoagulation due to a history of a gastrointestinal bleed), urothelial carcinoma s/p transurethral resection of bladder tumor, benign prostatic hyperplasia with urinary obstruction status post chronic indwelling Foley catheter, Crohn's disease (without known strictures or fistular disease) currently in remission, and chronic kidney disease, who presented with a 3-day history of decreased urine output from Foley catheter. This was associated with chills, burning micturition, nausea, abdominal pain, and loose stools. Upon presentation to the emergency department, the patient was afebrile, diaphoretic, and normotensive with associated tachycardia. The patient's physical examination was remarkable for suprapubic tenderness in addition to purulent discharge from his Foley catheter. Initial labs revealed leukocytosis with elevated lactic acid, creatinine, and potassium levels. Urinalysis was positive for red blood cells, white blood cells, Bacteria, and leukocyte esterase.

Computed tomography (CT) abdomen and pelvis scan (without contrast) revealed a recurrent bladder mass involving the prostate gland and adjacent prostate mass/peripheral soft tissues, along with moderate to severe bilateral hydronephrosis and diffuse hydroureters. Consequently, the patient's Foley catheter was exchanged by the urology team, 2 sets of blood cultures were drawn, and he was started on intravenous fluids in addition to vancomycin given his history of methicillin-resistant Staphylococcus aureus bacteremia and piperacillin-tazobactam empirically for sepsis. After the Foley exchange, the patient reported improved urine output and decreased lactic acid levels. On the 3rd day of admission, the patient's blood culture showed positive for *Veillonella* species and Escherichia coli. The *Veillonella* species isolated later revealed to be *V. dispar* using MALDI-TOF for speciation. The patient's antibiotic coverage was changed to ceftriaxone, and in the following days, the patient's leukocytosis started improving. On the 10th day of hospitalization, antibiotic susceptibilities revealed sensitivity to penicillin, meropenem, ampicillin, and metronidazole and resistance to piperacillin. Given overall condition of the patient and concerns for progression of the malignancy with the inability to respect the tumor and the possibility of recurrent sepsis, goals of care discussion were held with the patient and family, they opted to pursue hospice, and additional treatment was discontinued.

DISCUSSION

Veillonella are Gram-negative diplococcus that constitute part of the normal human flora, but have been associated with polymicrobial infections.[6] While *Veillonella* species are typically benign, risk factors such as intravenous drug abuse, malignancy, and immunosuppression predispose towards deep infections.[7] There are 5 case reports published about true deep-seated infections, including endocarditis, osteomyelitis, prosthetic joint infection, and bacteremia associated with *V. dispar*, with the first one reported in 1990 in a patient with endocarditis.[6,8-11] We report the sixth case overall of *V. dispar* infection and the fifth associated with *V. dispar* bacteremia.

In our case, a prior history of bladder cancer, Crohn's disease, and the locoregional extension of the urothelial cancer at the current visit were significant risk factors. While our patient had several predisposing factors, the source of infection in our patient seemed to be the urinary tract because of the associated urinary symptoms, chronic Foley catheter placement and chronic manipulation leading to infection. *Veillonella* species are a normal part of the urogenital area and thus the predisposition in our patient. However, *Veillonella* species are present within the gastrointestinal tract as well and our patient has history of Crohn's disease but no noted extra manifestations, making it less likely to originate from GI tract. Treatment regimen for *Veillonella* remains unclear, but it remains susceptible to a diverse range of commonly used antibiotics. Prior literature has recommended 6 weeks of antimicrobials for endocarditis and 4-11 weeks of treatment for osteomyelitis secondary to *Veillonella*.[5,12] *V. dispar* subtype infections were successfully treated with penicillin, ceftriaxone, clindamycin, ampicillin, amoxicillin and metronidazole, as reported in prev case reports (Table 1).[6,8-11] In our case, patient responded excellently to 1 week course of ceftriaxone, with further treatment discontinued because patient and family opted for hospice.

Table 1: Summary of case reports on *V. dispar* infections in humans.

Paper	Date	Resistance profile of *V. dispar*	Presenting signs/symptoms	Site of infection	Treatment	Duration	Outcome
Loughrey et al[8]	1990	Unavailable	3-week history of anorexia and lethargy after being treated for gingival abscess. History of rheumatic heart disease.	Bacteremia from mitral valve endocarditis vs. gingival abscess	Ampicillin 2 g q4 hr and oral metronidazole 400 mg TID then transitioned to clindamycin 450 mg q8h and underwent valve replacement	Unavailable	Excellent recovery post treatment.
Houston et al[9]	1997	Susceptible to: -Cefoxitin -Chloramphenicol -Clindamycin -Metronidazole -Penicillin	2-week history of fatigue and a 1-week history of intermittent fever.	Bacteremia from prosthetic mitral valve endocarditis.	IV Penicillin (18 million units per day)	6 weeks	Examination and repeat blood cultures negative at 6 months
Marchandin et al[11]	2001	Susceptible to: -Amoxicillin -Amoxicillin clavulanate -Clindamycin -Rifampicin	Sharp knee pain with swelling and major functional incapacity, h/o total knee replacement	Localized prosthetic joint infection	Debridement and amoxicillin 3 g daily with rifampicin 2g daily	6 months	Complete recovery of symptoms. Alive at 6 months follow-up

Continued.

Paper	Date	Resistance profile of *V. dispar*	Presenting signs/symptoms	Site of infection	Treatment	Duration	Outcome
Cobo et al[6]	2020	Unavailable	Fever (38.5 °C), diarrhea, and vomiting.	Bacteremia from suspected intra-abdominal source (unspecified)	Clindamycin 300 mg q8h	2 weeks	Improvement in symptoms. Alive at 2 months follow-up.
Shah et al[10]	2021	Susceptible to: -Penicillin -Amoxicillin-clavulanate -Metronidazole	Fever and back pain. History of IV drug use.	Bacteremia from tricuspid valve endocarditis vs. vertebral osteomyelitis.	IV ceftriaxone	6 weeks	Near-complete resolution of symptoms. Alive post-treatment.

CONCLUSION

In conclusion, *Veillonella* may be an emerging human pathogen, especially *parvula*, *atypica*, and *dispar*, in patients with the risk factors of drug abuse, immunosuppression, and malignancy. Our case highlights how patients with cancer of the urogenital tract have an increased predisposition towards *Veillonella* bacteremia because of its role as a part of the flora of the urogenital tract and the disruption caused by progressive urogenital cancer.

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