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CASE REPORT

A Rare Occurrence of Sepsis Caused by *Veillonella Parvula* in a patient with Underlying Choledocholithiasis

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SUMMARY

Veillonella parvula is a Gram-negative obligate anaerobe that is part of the normal anaerobic flora. The microorganism is usually regarded as colonization if isolated from the patient's sample. Here we report a rare case of sepsis caused by V. parvula in a female patient with underlying cholelithiasis. She was successfully treated with amoxicillin-clavulanate with appropriate dosage and at the correct time of her presentation to the hospital. V. parvula should not be considered a non-pathogenic microbe in patients with a history of underlying disease such as choledocholithiasis.
Keywords: Veillonella parvula, sepsis, choledocholithiasis.

INTRODUCTION

Veillonella parvula is a Gram-negative obligate anaerobe that is found in the oral, respiratory, gastrointestinal, and genitourinary tracts of humans[1-3]. The genus *Veillonella* was first isolated by Veillon and Zuber in 1898; further described by Prevot in 1933 with the present taxonomy involving six species: *V. parvula, Veillonella alcalescens, Veillonella dispar, Veillonella atypical, Acidaminococcus fermentans* and *Megasphaera elsdenii*. Only *V. parvula* and *V. alcalescens* have been isolated from clinical specimens. *V. parvula*-induced sepsis in a patient with underlying choledocholithiasis has rarely been reported. A high index of suspicion and proper antibiotic treatment at the correct time will enable the infection to be treated successfully and avoid surgical intervention.

CASE REPORT

A 41-year-old Malay lady presented to an Emergency Department with complaints of sudden onset of right hypochondriac and epigastric pain, which was colicky in nature, accompanied by fever for one-day duration. She gave a history of underwent Endoscopic retrograde cholangiopancreatography (ERCP) for choledocholithiasis in 2018. She was well since her last treatment and was discharged from the surgery team in May 2019.

On examination, she was alert, pulse rate was 88 beats per minute, blood pressure was 125/58 mmHg, normal respiratory rate, oxygen saturation was 99% under room air and the temperature was 39.9. Physical examination revealed tenderness which was localized at right hypochondriac and epigastric region. Murphy sign were absent. Ultrasound of Hepatobiliary system revealed multiple foci of calcification in segment VI which likely represent area of the previous lesion. The gallbladder was distended with sludge within. Patient underwent ERCP again for this current admission with findings of dilated intrahepatic duct and choledocholithiasis (Figure 1c).

Laboratory tests showed an elevated white cell count (WBC) of 17.16×10^9 g/L with 96% neutrophils with C-reactive protein (CRP) of 228.7 mg/L. Patient was started on intravenous amoxicillin-clavulanate 625mg three times daily and intravenous metronidazole 500mg twice daily. Blood sample that was sent to microbiology laboratory which was incubated under anaerobic condition grew pure growth of non-haemolytic colonies. (Figure1a). Gram Stain revealed Gram-negative cocci (Figure 1b). Identification by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) confirmed the identity of the microorganism as *Veillonella parvula*, with a score of 2.17 (Supplementary file 1). The Kirby-Bauer test, known as the disk-diffusion method, was used as the antibiotic susceptibility test to determine options of antibiotics. The microorganism was susceptible to penicillin, metronidazole and amoxicillin-clavulanate according to the criteria set by the Clinical and Laboratory Standards Institute (CLSI).

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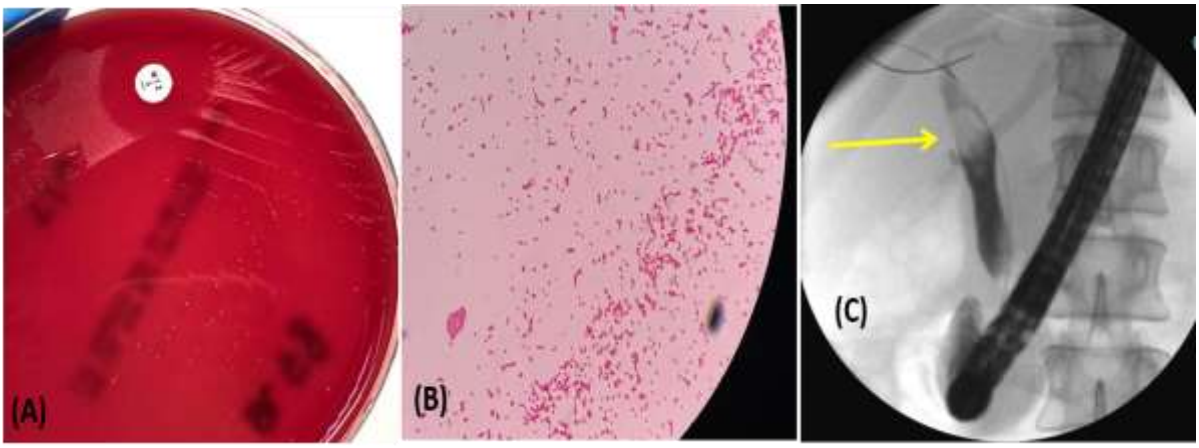

Fig. 1: (A) Tiny colony non lysis sensitive to metronidazole after 48 hour in anaerobic incubation. (B) Gram staining showed gram-negative cocci. (C) Yellow arrow shows filling defect (calculi) at the common hepatic duct with dilated intrahepatic duct. (Image of Endoscopic retrograde cholangiopancreatography (ERCP)).

Investigation of liver function test showed elevated alkaline phosphatase (135µmol/L) with normal serum transaminases (<35µmol/L) and amylase of 100U/L. Her kidney function was normal. The antibiotic was continued based on this sensitivity pattern. Repeated blood culture was no growth and she was discharged after 5 days of admission and follow up by surgical team within two months revealed the persistence of cholelithiasis. She is further planning for common bile duct exploration this year.

DISCUSSION

In this case, we have illustrated an uncommon cause of sepsis caused by *V. parvula* of a patient with underlying cholelithiasis which leads to serious sepsis in this patient. It was the only pathogen isolated in this patient during this episode of infection. Person experiencing cholelithiasis may be presented with right upper quadrant pain of the abdomen which is documented as a positive Murphy's sign. Other symptoms include referred pain to the right supraclavicular region and/or shoulder, nausea, and vomiting. *Veillonella* species, like other anaerobic infections, are frequently involved in polymicrobial processes, making it difficult to define their pathogenic role. This is because the species rarely caused severe infection. However, *V. parvula* is the most common one reported to cause infection in humans in previous studies but occurrence of *Veillonella* infections has limited literature publication. Most anaerobic infection studies and reviews exclude *Veillonella*, most probably because it is considered to be a normal commensal or nonpathogenic organism most of the time[2]. *Veillonella* has been associated with severe infections such as bacteremia, meningitis, osteomyelitis, prosthetic joint infection, and endocarditis in a few cases reported in the literature[1,2]. The most frequent infections associated with *Veillonella* were sepsis and bacteremia. (37.5%), bone and joint infectious diseases (33.3%) and endocarditis (20.8%)[3]. Bacteremia is almost often reported in association with an underlying infection.[3] However, Randal in 1996 has reported a case of *V. parvula* bacteremia in the absence of an underlying site[4].

Risk factors for V*eillonella* infection include periodontal disease, immunodeficiency, intravenous drug use and premature birth.[5]. However, a case of *Veillonella* infection of the spine has been documented in an otherwise healthy adult[5]. There were no apparent risk factors in the patient described in this case report but she had undergone ERCP for multiple episodes for choledocholithiasis. There is little recent literature on the prevalence of *Veillonella* bacteremia following endoscopy[6]. However, due to disruptions in the normal ecological balance of the biliary system caused by cholelithiasis, there is a risk of bacterial translocation into the bloodstream in this patient[5].

Veillonella parvula in this case was isolated in pure culture from blood, which was incubated under anaerobic condition, from a patient with history of choledocholithiasis. The isolation and identification of anaerobes by phenotypic and DNA-based molecular methods at a species level is time-consuming and laborious. Matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) has emerged as a tool for identifying clinically relevant anaerobes. These isolates *of V. parvula* was identified by MALDI-TOF MS with a score of 2.17.

The administration of appropriate antibiotics at the correct time is very important. Penicillin, cefoxitin, ceftriaxone, chloramphenicol, clindamycin and metronidazole were sensitive against *Veillonella* isolates. The organism on the other hand was resistant to tetracycline, vancomycin, aminoglycosides and ciprofloxacin[5]. In this case, an antimicrobial susceptibility test using the disc diffusion method (Kirby-Bauer) showed susceptibility to penicillin, metronidazole and amoxicillin-clavulanate, according to the Clinical and Laboratory Standards Institute's standards. Patient had received intravenous amoxicillin-clavulanate and also intravenous metronidazole during admission and responded well. Li et al in 2017 have reported a case of *V. parvula* which was successfully treated with chloramphenicol[7]. Other reported cases of *V. parvula* infections, such as infections of the spine, have been effectively treated with antibiotics alone, with surgery required only when antibiotics have failed or when there is significant disease progress[5].

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Informed consent: Written and verbal consent were obtained from the patient for her anonymized information to be used in this article.

Ethical approval: Our institution does not require ethical approval for reporting individual cases or case series.

Authors Contribution: AK conceived, designed the study and did writing & editing of manuscript, **AH** did data collection and manuscript writing, **SAH** did review and final approval of manuscript,

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