

Gram-Negative Bacteremia due to *Capnocytophaga Canimorsus*

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Introduction

- We report a case of gram-negative bacteremia caused by *Capnocytophaga canimorsus* in a patient without any immunocompromising conditions

Case Presentation

- 75-year-old male presented with fever, chills, and generalized weakness for 3 days
- Vitals and labs: Temperature was 102.8 °F, WBC: 15,500 cells/ μ L, elevated CRP 18.2 mg/dl and ESR 37 mm/hr, Pan CT did not reveal any source of infection. Blood cultures were negative for the first 48 hours.
- Treatment: Empiric antibiotic therapy with ceftriaxone and azithromycin was started after sending blood cultures. Suspecting viral etiology, antibiotics were discontinued and he was discharged.
- Readmitted as blood cultures started growing gram-negative bacilli. He was started on piperacillin-tazobactam. After six days blood cultures resulted as *C. canimorsus*.
- Further questioning towards the source of the bacteremia revealed that he had a pet dog with whom he shared food and had sustained a scratch on left forearm 1 week prior to initial presentation which was the proposed portal of entry. Over the course of a few days, fever subsided, leukocytosis resolved and the patient improved clinically and was discharged home on amoxicillin-clavulanic acid for 14 days.

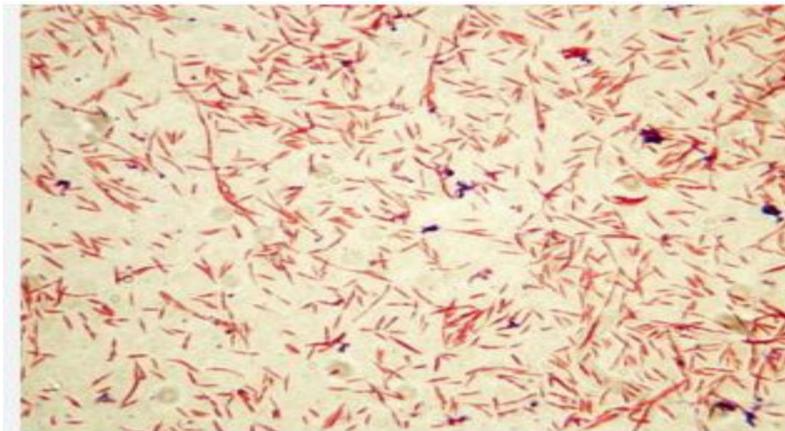


Figure 1: Gram negative bacilli

Discussion

- *Capnocytophaga canimorsus* is a fastidious, slow-growing, gram-negative bacilli belonging to the genus *Capnocytophaga* in the family Flavobacteriaceae (1)
- It is part of the normal flora in the oral cavity of humans, dogs and cats and is normally transmitted to humans through the bite or saliva of dogs and cats
- Population-based study in the Netherlands showed that the incidence of infection was approximately 0.67 infections per million population (2)
- It is known to cause opportunistic infection in humans with a weak immune system as seen in patients with chronic alcoholism, patients who have cancer, HIV, diabetes and post splenectomy
- It causes a wide variety of illnesses in humans including sepsis and septic shock, endocarditis, pneumonia with empyema, abscess, etc.

- The case fatality rate of up to 31 percent has been reported in the immunosuppressed. (3) Main modality of diagnosis is through blood cultures which usually is positive after more than 48 hours as was evident in our patient.
- While the infection is most commonly seen in immunosuppressed individuals there have been reported cases in the immunocompetent hosts (4) which usually manifests as sepsis or meningitis
- Patients with severe *Capnocytophaga* infection should be treated initially with a beta-lactam-beta-lactamase combination (such as piperacillin-tazobactam) or a carbapenem (such as imipenem)

Conclusion

- This case highlights the importance of considering *Capnocytophaga* species as a potential cause of gram-negative bacteremia, particularly in individuals with exposure to animals. Prompt identification and appropriate antibiotic therapy are crucial in managing these infections effectively.

References

1. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of High-Consequence Pathogens and Pathology (DHCPP)
2. Van Dam AP, Jansz A. *Capnocytophaga canimorsus* infections in The Netherlands: A nationwide survey. *Clin Microbiol Infect.* 2011 Feb;17(2):312-5. Doi: 10.1111/j.1469-0691.2010.03195.x. PMID: 20167010.
3. Pers C, Gahrn-Hansen B, Frederiksen W. *Capnocytophaga canimorsus* septicemia in Denmark, 1982-1995: review of 39 cases. *Clin Infect Dis* 1996; 23:71.
4. O'Riordan F, Ronayne A, Jackson A. *Capnocytophaga canimorsus* meningitis and bacteraemia without a dog bite in an immunocompetent individual. *BMJ Case Rep.* 2021 Jul 21;14(7):e242432. doi: 10.1136/bcr-2021-242432. PMID: 34290010; PMCID: PMC8296814.