Capnocytophaga canimorsus Aortitis in an Immunocompetent Host

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Abstract

Capnocytophaga canimorsus *is a commensal organism of canine and feline oral flora known to cause severe infections most frequently reported in immunocompromised hosts. We describe a case of bacterial aortitis secondary to* C. canimorsus *in an 80-year-old immunocompetent female, who presented with fever, non-specific lower back, and pelvic pain. Infection was confirmed with positive blood cultures and serial imaging.*

Keywords

Capnocytophaga, aortitis, zoonosis, dog bite

Abbreviations and Acronyms

MIC = Minimum inhibitory concentration

Introduction

Capnocytophaga canimorsus is a slow-growing, gram-negative rod, commensal to the oral flora of canines and felines. It is a known human pathogen causing severe infections, most frequently occurring after dog bites or cat scratches, with the former being the most prevalent.[1] Transmission through contact with animal saliva has also been described, as well as cases with no known animal exposure.[2] Additionally, asplenia, alcohol abuse,[2] and HIV infection[3] have been found to predispose to this zoonosis. Various infections have been described to date, with sepsis being the most common clinical presentation.[1] Others include endocarditis, meningitis, infectious arthritis, and mycotic aneurysm. We present a case of *Capnocytophaga* aortitis in an immunocompetent host.

Case Report

An 80-year-old female presented with subjective fevers, chills, and a 1-week history of dull, ill-defined lower back, bilateral buttock, and pelvis pain. The patient had a history of coronary artery disease, diabetes mellitus type II, and a recent flare of nummular eczema on her bilateral lower and upper extremities, for which she was prescribed steroid cream. No significant family, social, or travel history were elicited. The patient had a pet dog, no history of animal bites or scratches, and no other exposures. On physical examination, she was afebrile, there was mild tenderness to palpation to the paraspinal muscles in her lower back, and self-inflicted excoriations on her bilateral forearms. The remainder of her exam was unremarkable. Her erythrocyte sedimentation rate was noted to be 119 mm/hr (reference range: 0–25 mm/hr) and C-reactive protein was 7.7 mg/dL (upper reference limit: <0.8 mg/dL). Blood cultures turned positive after 4 days of incubation with gram-negative rods that were later identified as *Capnocytophaga canimorsus* by mass spectrometry. Transthoracic echocardiogram was negative, magnetic resonance imaging of the hips showed degenerative joint disease, but no signs of infectious arthritis; imaging of the lumbar spine showed no spine changes, but revealed enhancement around the infrarenal aorta consistent with early bacterial aortitis. Surgical intervention was not indicated, and medical management was recommended.

Pending sensitivities, the patient was started on ciprofloxacin, but after 10 days of treatment, there was no improvement of her symptoms, and she developed new abdominal fullness and pressure. Given the prolonged growth of the bacteria on the cultures, characteristic for *Capnocytophaga*, the patient was empirically switched to ceftriaxone as an outpatient. Imaging to assess for resolution was performed 2 weeks later, which found ill-defined areas of soft tissue attenuation surrounding the suprarenal and infrarenal abdominal aorta, suggesting that her aortitis had progressed. Ceftriaxone resistance was confirmed on blood cultures at day 24. Due to the fastidious nature of *Capnocytophaga*, we were only able to obtain sensitivities to 4 antimicrobial agents: ceftriaxone with a minimum inhibitory concentration (MIC) of ≥4 μg/mL, meropenem (MIC ≤ 0.06 μg/mL), penicillin (MIC ≤ 0.06 μg/mL), and ciprofloxacin. The patient refused further intravenous antibiotics limiting therapeutic options outside of the fluoroquinolones class. The MIC for ciprofloxacin was ≤0.12 μg/mL indicating sensitivity. The patient was once again started on ciprofloxacin, and after an additional 4 weeks of therapy, reached a complete resolution of her symptoms. Follow-up abdominal computed tomography with intravenous contrast at 3 and 6 months since the initial presentation showed no evidence of active aortitis or aortic aneurysm. It was not entirely clear how the patient acquired the infection, but after a careful review searching for any exposures, she stated that she allowed her pet dog to lick the excoriations brought on by her eczema. The lick by her dog is the presumed source of her infection.

Discussion

Capnocytophaga canimorsus is an occasional human pathogen that carries with it a high mortality rate.[1,4] While the most common form of infection is bacteremia, great vessel infection is an extremely rare manifestation. To date there have been 4 cases of

aortic infection due to *Capnocytophaga canimorsus* described in the literature: 1 case of prosthetic aortitis in an HIV positive patient,[3] and 3 cases of *Capnocytophaga* mycotic aneurysm of the aorta following dog exposures which were listed as either scratches or dog bites.[5-7] Our patient had none of the typical risk factors, demonstrating that *Capnocytophaga canimorsus* can cause aortitis in immunocompetent patients without underlying aortic disease and without resultant mycotic aneurysm formation. It may present with poorly localized, non-specific pain, which can delay the diagnosis. A high index of suspicion is essential to diagnose and initiate treatment promptly. The slow-growing character of this bacteria makes the process of obtaining sensitivities difficult; hence, therapy is dictated mostly by a clinical response with the caveat that symptoms may be slow to respond despite appropriate coverage. Though there are no in-depth studies to dictate the length of treatment, the widely held consensus is a minimum of 6–12 weeks of antimicrobial therapy.[8]

It is important to note that fluoroquinolones are associated with an increased risk of aortic aneurysm and dissection. Recognizing that fluoroquinolone use and aortitis are 2 independent risk factors for aneurysm formation and dissection, it might be reasonable to use alternative antimicrobials and reserve fluoroquinolones for cases with no other available therapeutic option. Notably, based on the patient's choice of oral antibiotic therapy, we were limited to the fluoroquinolone class.

Capnocytophaga canimorsus was previously considered to be universally susceptible to fluoroquinolones; however, there are reports of resistance. In 1 study, more than half of studied strains were resistant to ciprofloxacin.[9] Resistance to β-lactam antibiotics is variable, best studied in immunocompromised patients, ranging from 1 out of 28 studied strains[9] to as high as 18 out of 24 strains[10] and associated with prior exposure to β-lactam antibiotics,[10] which our patient did not have. Despite *Capnocytophaga canimorsus* resistance to ceftriaxone in our case, a third-generation cephalosporin is still a viable option in the empiric treatment of infectious aortitis.

Conflict of Interest

None of the authors identify any conflict of interest.

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