

Beware of the dog – *Capnocytophaga Canimorsus* septic shock: a case report

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Abstract. – *Capnocytophaga canimorsus* is a Gram-negative rods frequently isolated as commensal in the saliva of pets that can be transmitted to humans. We report a case of septic shock caused by this pathogen. A 78-year-old man affected by diabetes and hypertension was admitted for fever in our Emergency Department. He reported fever (37.7°C) with normal values of blood pressure, heart rate and saturation of oxygen. Laboratory studies showed increased values of procalcitonin and normal white-cell level. Blood cultures were collected and an empirical antibiotic therapy was started. He reported six days earlier a bite of a dog at the right hand. During the following days the patient presented a deterioration of clinical conditions with fever, asthenia and comparison of petechial lesions. *C. canimorsus* was isolated from blood cultures. He was treated with fluids and appropriate antibiotic therapy with a full recovery. Dog wounds are frequent minor injuries with an underestimated worldwide incidence because only few patients develop complications. *C. canimorsus* could be an emerging cause of sepsis, also in immunocompetent patients. The current understanding of risk factors for *C. canimorsus* associated sepsis and a prompt approach to anamnesis and treatment of early stage injuries, could have a considerable medical outcome.

Key Words:

C. canimorsus, Sepsis, Zoonosis.

Introduction

Capnocytophaga Canimorsus (name derived from the Latin: canis-cane and morsus-bite), is a Gram-negative bacterium belonging to the Flavobacteriaceae family. It is a commensal anaerobic microorganism commonly present in the oropharyngeal microbial flora of many animals, including pets such as cats and dogs, and it can be transmitted to humans through saliva in case of licking

of pre-existing wounds (27% of cases), scratches (8.5% of cases), bites (54% of cases) from these animals¹⁻⁴. This bacterium was isolated in 1976 for the first time from the blood of a patient who had been bitten by a dog and subsequently developed sepsis and meningitis³. *C. Canimorsus* is a slow-growing bacterium and this behavior is due to the long incubation and difficulties about his cultivation. In fact, due to its nutritional characteristics, it needs to grow in specific soils and in particular conditions (the optimal growth of this bacterium is in an environment with 5-10% of CO² and a temperature of 37°C)¹. The gold standard exam for finding this bacterium is the polymerase chain reaction method. The prophylactic first line therapy in case of *C. Canimorsus* infection is the Amoxicillin/Clavulanic acid. In immunocompetent patients, usually this micro-organism causes asymptomatic infections or local reactions that are not harmful for life². The subjects who are most exposed to a worst clinical outcome are elderly, asplenic or cirrhotic patients, chronic alcohol abusers, patients affected by beta-thalassemia or hemochromatosis (the accumulation of iron, in fact, constitutes a favorable environment for the growth of *C. Canimorsus*) or immunodeficiency³. During the incubation period, lasting from 1 to 7 days, patients may present local symptoms such as skin erythema at the site of the bite, loss of serum or purulent material from the wound site, lymphadenopathy, lymphangitis. It is possible the presentation with less specific symptoms such as asthenia, dyspnea, abdominal pain or systemic symptoms such as sepsis, meningitis, osteomyelitis, peritonitis, endocarditis, pneumonia, septic arthritis⁴.

Case Presentation

A 78-year-old man was found pyretic and unconscious at home and then conducted to our Emergency Department in our hospital by his

relatives. He had a medical history of diabetes mellitus, dyslipidemia and arterial hypertension. At first evaluation in Emergency Room he was awake and oriented, he reported fever (37.7°C) with normal values of blood pressure (131/69 mmHg), heart rate (85 b.p.m.), and peripheral oxygen saturation (95%). He showed increased values of PCR (277 mg/L), procalcitonin (33.71 ng/mL), creatine-kinase (31000 UI/L) and lactic dehydrogenase (1100 UI/L). Chemical-physical urine exam was normal. Blood cell count showed normal white-cell and hemoglobin level. In addition, instrumental exams like chest radiography and cranial computed tomography were normal. Blood cultures were collected and an empirical antibiotic therapy was started with piperacillin/tazobactam 4.5 g TID and intravenous fluids.

Subsequently, the patient was admitted to the Urgency Medicine Department. Asking better his recent medical history, he reported six days earlier a bite of a stranger dog at the level of the fourth finger of the right hand that patient did not medicated neither referred to the family doctor. During the following days the patient presented a progressive deterioration of clinical conditions with fever, asthenia and comparison of lesions of the lower limbs compatible with petechial lesions. The isolation from blood cultures revealed a severe sepsis by *C. canimorsus* and the source of bacteremia was with high probability that unknown dog. He was treated with prompt fluids resuscitation strategies and the antibiotic therapy was optimized with Vancomycin 1 g BID and Clindamycin 600 mg QID with an improvement of clinical condition.

The patient was subsequently admitted to Infectious Diseases Department of our Hospital for continuing antibiotic therapy and exams and he survived to this life-threatening condition with a full recovery and without long term morbidity.

Discussion

C. canimorsus is a slow-growing bacterium and is a component of the normal oral flora of dogs and cats. It is one of the most potentially dangerous pathogens related to sepsis and septic shock described in medical literature and the fatality rate is about 26% of patients⁵. It is well known that, in case of infection, there are several

risk factors for subsequent medical complications, such as asplenia, long history of alcohol abuse, cirrhosis, immunosuppressive therapy, potentially leading to serious consequences. The most observed presentation in these kind of patients is sepsis, meningitis, osteomyelitis, peritonitis, endocarditis, pneumonia or septic arthritis^{6,7}. Dog wounds are frequent minor injuries with an underestimated worldwide incidence because only few patients develop complications. *C. canimorsus* could be an emerging and leading cause of sepsis, also in immunocompetent patients but affected by chronic diseases. In addition, our work highlights as the current understanding of risk factors for *C. canimorsus* associated sepsis and a prompt approach to anamnesis, diagnosis and treatment of early stage injuries, could have a considerable medical outcome.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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