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Case Report

Infective Endocarditis of a Native Valve due to Pasteurella Multocida

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Abstract

The present case involves a 73-year-old female patient who presented with fever and gram negative bacteremia. Finally, the work up diagnosis was Pasteurella multocida bacteremia, a result of cat licking that led to aortic valve endocarditis. Intravenous administration of ampicillin-sulbactam for six weeks was the appropriate antibiotic regimen.

Keywords: Gram negative bacteremia; Pasteurella Multocida; Zoonotic disease; Infective endocarditis; Penicillin treatment

Introduction

Pasteurella species are a physiologic contaminant of mammals' and fowl's oral cavity. Specifically, Pasteurella multocida is among Pasteurella species' the commonest ''habitant'' of domestic animals, mainly cats and secondarily dogs [1]. It is a gram-negative coccobacillus, nonmotile and non-spore-forming that is capable of causing infections, indolent to severe enough, to humans. Soft tissue infections commonly result following an animal's bite, scratch or even licking [2]. Nonetheless, osteomyelitis, respiratory disease, bacteremia and invasive infections such as meningitis, endocarditis, septicemia and septic shock may also occur [3]. Neonates and elderly are mostly affected [4,5]. Disseminated disease has been described in immunocompromised individuals, such as patients with diabetes mellitus, alcohol abuse, cancer and hematological malignancies [6,7]. However, in the current literature, a few cases of invasive Pasteurella multocida infections have been reported in immunocompetent hosts as well [1]. Herein, we present a case-report of a 73-year-old woman, who was used to live with domestic cats and presented to the emergency department due to new onset fever. Multiple groups of blood cultures grew Pasteurella multocida and transthoracic echocardiogram (TTE) showed vegetation on aortic valve. Hence, the diagnosis of infective endocarditis was made. After six weeks treatment duration with intravenous ampicillin-sulbactam, a repeated TTE demonstrated that the pre-existing aortic vegetation had disappeared. It is worthy to note that our patient who was suffering infective endocarditis due to a zoonotic bacterial disease, did not mention cat scratch or bite and she had only being licked by her cat. Besides, she was not suffering from a serious underlying medical condition.

Case Presentation

A 73-year-old woman presented at the emergency department of internal medicine due to fever that first appeared six hours ago. Accompanying rigor was present. Her past medical history included hypothyroidism, congenital lymphedema of the lower extremities bilaterally and beta thalassemia trait. She denied tobacco and alcohol use. Her medications' list included thyroid replacement therapy only, with thyrohormone 0.1mg and she was not taking any over the counter medications. She had no allergies. Social history was significant for living with domestic pets, mainly cats. She did not recall any recent cat scratch or bite, just cat licking.

She did not refer recent travel. Upon her arrival at the emergency department, her vital signs were the following; blood pressure 100mmHg over 70mmHg, heart rate 97 bpm, oxygen saturation 98% on room air and temperature of 38.60C. The patient was alert, attentive and oriented. Cranial nerves were intact. Muscle strength and tone were normal. Deep tendon reflexes were normal and the plantar responses were normal too. Light touch, pinprick, position sense, and vibration sense were intact in fingers and toes. There was no dysmetria on finger-to-nose and heel-knee-shin. The gait was steady and Romberg sign was absent. No meningeal signs were present. On cardiac auscultation, the heart sounds were audible. There was a sinus rhythm, and no murmurs or gallops were noted. Chest inspection revealed kyphosis, an abnormally excessive convex curvature of the spine as it occurs in the thoracic region. Lung auscultation was normal and abdominal examination revealed no pathological findings. There was no costovertebral angle tenderness. Skin examination revealed lymphedema of the

lower limbs bilaterally and numerous abrasions at the upper and lower extremities. A necrotic eschar was present close to the left elbow. There were no palpable peripheral lymph nodes. 12-lead electrocardiogram showed a first degree atrio-ventrivular (AV) block. Chest X-ray disclosed cardiomegaly and normal lung parenchyma. Abdominal X-ray had no air fluid levels or bowel dilatation, while kidney ultrasound showed no ureteral tract dilation. The abnormal laboratory findings were; white blood cells (WBCs) 16.820 × 109/L (polymorphonuclear leukocytosis), erythrocyte sedimentation rate (ESR) 75 mm, c-reactive protein (CRP) 100 mg/l. Polymerase chain reaction (PCR) for severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) was negative. The patient admitted to the hospital for further investigation and support. Blood and urine cultures were immediately obtained and the patient was placed on intravenous antibiotic therapy with ampicillin-sulbactam ''empirically''. Two days later, the microbiology lab noticed the medical team that three different sets of blood cultures were positive for a gram-negative coccobacillus, while the urine cultures were negative for any microorganism. For further investigation, in order to determine the primary focus of infection, computed tomography of the chest and abdomen was ordered; small pleural effusions bilaterally and arterial calcifications of arterial network were present. Due to sustained bacteremia, although the microorganism was gram-negative, cardiac ultrasound was ordered. Transthoracic echocardiogram exhibited a calcified tricuspid aortic valve and a hypoechoic, mobile mass (5mm) on the abdominal surface of the left coronary fold, which caused a small degree of insufficiency. The gram-negative microorganism, that was isolated from blood cultures, was an extremely rare pathogen causing endocarditis, named Pasteurella multocida. The diagnosis of infective endocarditis was made. Since the patient had already well responded to existing antibiotic treatment; meaning that she was hemodynamically stable and afebrile, and the microorganism's antibiogram was sensitive to penicillins, it was decided that the patient should continue receiving intravenous treatment with ampicillin-sulbactam for a total of six weeks. Her hospital stay was not complicated by other nosocomial infection and two days before her discharge, a repeated echocardiogram displayed reversal of the pre-existing vegetation.

Discussion

Pasteurella multocida, a gram-negative coccobacillus which shows bipolar staining, is found in oral cavity of animals as a commensal [8]. It was first isolated in 1878 by Kitt, during an epidemic in wild hogs. Pasteur described the microorganism two years later [9]. It may cause devastating disease such as rabbit septiceamia, swine plague and haemorrhagic septiceamia in cattle [10]. Furthermore, Pasteurella species can affect humans as well, causing a wide range of systemic illness. An increasing number of infections have been reported in recent years [11]. There are many different species of Pasteurella; P. canis, P. dagmatis, P. stomatis but P. multocida is the most common pathogen affecting humans. It is a small, non-spore forming, nonmotile bacterium that grows well at 37C on 5 percent sheep blood agar. Cats and dogs have the highest carriage rate at 70 to 90 percent and 20 to 50 percent, respectively. Animal's bite or scratch is usually preceded the infection, although this is not a prerequisite; licking from domestic animals, kissing animals or even sharing food items with them, have strongly been associated with infection [10,12]. People at risk are those whose immune status is compromised; cirrhotic patients, transplant recipients, patients with hematologic malignancies or on peritoneal dialysis. Elderly and neonates are frail too [4-7]. Pasteurella attacks soft tissue, respiratory system and it is capable to cause invasive infections that are often unrelated to bites, such as meningitis, intraabdominal or ocular infections and endocarditis [13]. Infective endocarditis is a rare complication of Pasteurella infection and until now only 36 cases have been described in the medical literature. Among those total 36 cases, 24 cases were attributed to P. multocida while the rest of them were a result of other P. subspecies. According to a recent statistical analysis of the current literature, men are affected more than women and the median age at the time of presentation was 57. Only 15 cases did refer an already known animal scratch, bite or licking while 6 out of 36 patients had no significant past medical history [14].

Our experience with P. multocida endocarditis was in a 73-year-old woman who loved to care for animals, especially cats and she had no prior history of a comorbid condition. There was not a known history of scratch or bite caused by her pets. Due to the rarity of P. multocida pathogen and due to the scarcity of gram-negative infective endocarditis, bacteremia's primary focus was questionable until the release of blood cultures' results. Gram-negative bacteremia has mostly been associated with osteomyelitis, intraabdominal or urinary tract infections [15]. Infective endocarditis due to gram negative bacteremia has been reported in less than 2 per cent [16]. The critical thought that led our medical team to include into the differential diagnosis the clinical scenario of infective endocarditis was the sustained bacteremia; three different sets of blood cultures in two different days. Cardiac ultrasound established the diagnosis, showing the vegetation at the calcified aortic valve, while microorganism's identification was pending. Pasteurella multocida was the culprit. The patient at that time did report cat licking.

The presence of fever congenital lymphedema and a necrotic eschar at the left elbow, as well as the absence of an obvious skin trauma (resulting from an animal's bite) during history taking and physical examination, disoriented clinicians and it was initially hypothesized that an incipient soft tissue infection was taking place. Besides, there was not still present any physical or laboratory finding supporting strongly a soft tissue infection. Thus, ''empirical'' intravenous antibiotic treatment with ampicillin-sulbactam was initiated, which as it was concluded later was the

appropriate antibiotic scheme for our patient's ''real'' infection.

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