A Rare Presentation of Sepsis from *Staphylococcus caprae*

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Abstract: As a coagulase negative *Staphylococcus* species, *S. caprae* is not considered as a clinically-significant member, unlike *S. epidermidis.* In this report, we describe a case of sepsis resulting from *S. caprae* infection. This relatively young woman was in generally good health and contracted *S. caprae* most probably during her treatment of an acute pulmonary embolism. The purpose of this report is to raise awareness of this otherwise innocuous staphylococcal species in clinical settings.

Key Words: *Staphyloccocus caprae,* coagulase negative staphylococci, nosocomial, sepsis.

INTRODUCTION

Coagulase negative staphylococci are one of the most common nosocomial agents for causing infections in healthcare facilities [1, 2]. Among the species, *S. caprae* has not been a concern in human clinical cases. It was first isolated in milk sample taken from healthy goats in 1983 [3]. Since then, this bacterium is considered a commensal organism in goats as it is most prevalent on their udder skins and in the mammary glands.

Strains of *S. caprae* have been isolated from human cases; however, it was not always clear whether this organism was responsible for causing infections [4, 5]. This bacterium has been associated with bone and joint infections, bacteremia, recurring sepsis, urinary infections, endocarditis, meningitis, and cases of acute otitis externa [2, 4-9]. Most of these infections were contracted in the hospitals, and a few community-acquired have also been reported. A recent paper reported *S. caprae* was responsible for causing six out of eighteen episodes of coagulase negative staphylococcal bacteremia in the neonatal intensive care unit of a medical institution [2].

CASE PRESENTATION

A 30-year old African American woman presented to the emergency department complaining of shortness of breath on exertion and chest pain with deep inspiration. Otherwise, the patient stated she was well. There was no indication of recent infections.

Her physical examination did not yield any abnormalities or concerns. A VQ scan indicated high probability for pulmonary emboli in her right lobe. The chest x ray showed possible development of small bilateral pleural effusions. Multiple nodular opacities scattered throughout the lungs were also noted and they seemed to be more prominent than before. The CT scan of the abdomen showed moderate alveolar consolidation in the right lower lobe which was consistent with a pulmonary infarct or pneumonia. Her EKG and 2D echocardiograms were normal and there was no indication of endocarditis.

The patient was admitted for treatment of an acute pulmonary embolism and a Heparin drip, by protocol, was initiated. While the management of her pulmonary embolism was proceeding well, the patient developed high fevers during her hospital stay associated with tachycardia. Her blood cultures were positive (four out of four bottles), yielded Gram positive cocci in pairs and clusters indicative of *Staphylococcus* species. Subsequent identification by Vitek 2 GP card (bioMérieux, MO) indicated the bacterium was *S. caprae*. Antibiotic susceptibility results of this isolate are presented below.

Antimicrobial Agents	Result (mm)	Interpretation
Ampicillin	22	Resistant
Ampicillin/Sulbactam	27	Sensitive
Clindamycin	28	Sensitive
Cephalothin	35	Sensitive
Erythromycin	33	Sensitive
Gentamcin	31	Sensitive
Imipenem	53	Sensitive
Oxacillin	20	Sensitive
Penicillin	19	Resistant
Rifampin	35	Sensitive

The patient was initially started on vancomycin. When *S. aureus* was ruled out, her antibiotics were changed to Kefzol 2 gm IV every 8 hours. The patient's fever resolved and she showed significant clinical improvement. Incidentally, a urinalysis indicated the presence of *E. coli.* Antibiotic susceptibility testing indicated it was sensitive to all 17 antimicrobial agents in the panel (Vitek *E. coli* panel). Three

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days of Ciprofloxacin was administered to treat the urinary tract infection.

Echocardiogram did not reveal any evidence of endocarditis, and it is unclear what caused the infection. There was no indication that the patient recently visited a farm or had contact with goats, the likely sources to acquire this bacterium. Other risk factors reported to be associated with *S. caprae* infection such as transplants, internal fixation for orthopedic prosthesis, or foreign subject implants [4, 5, 7, 9] were not in the patient's medical history.

COMMENTS

It is conceivable that the patient contracted *S. caprae* during her hospital stay, as this bacterium has been implicated in several nosocomial infections [1, 5]. *S. caprae* had been misidentified in the past [2, 6, 7, 10], which suggest there are probably more cases associated with this bacterium than previously reported. In this case report, the identity of *S. caprae* was established by the current Vitek 2 GP system which allows more reliable identification of the *caprae* species than previous versions [personal communication with bioMérieux]. Additionally, this isolate produced acid from mannitol and was urease positive, two important biochemical traits recommended for differentiating this species from other coagulase negative staphylococcal members [10].

In conclusion, clinicians should be cognizant of infections caused by *S. caprae*, particularly in hospital settings and healthcare facilities. Although this species has been regarded as innocuous in the past, it should not be dismissed readily especially when isolated from the elderly and immunocompromised patients. Some *S. caprae* strains have acquired methicillin resistance, and their ability to persist in the environment for a long time (*i.e*., 28 months or more) has been reported [2, 6]. Furthermore, slime production and biofilm formation are traits of *S. caprae* and they may play a role in conferring virulence to this species [11, 12]. All these properties of *S. caprae* are certainly reasons for healthcare professionals to be concerned and keep vigilance. Therefore, early detection and accurate identification of this bacterium will help preventing serious complications that may result from the colonization and invasion of this skin flora.

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