

Septic Shock in a Patient With a Probable Rhino-Pharyngeal Cancer Abscess Due to *Gemella* Species

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Abstract

A case of septic shock due to *Gemella* spp in a patient with a probable rhino-pharyngeal cancer-abscess is described. *Gemellae* have been associated to severe infections such as endocarditis and meningitis but septic shock has been usually considered a rare finding. Well-known risk factors for *Gemellae* bacteremia are neutropenia, antibiotic prophylaxis and proton pumps inhibitors, but reports in patients with solid cancers are increasing and the presence of a damaged oral mucosa could help their dissemination. The hypothesis that *Gemellae* may be encountered as opportunistic pathogens in immunocompromised patients and a preventive approach to these infections are suggested.

Keywords: *Gemella*; Septic shock; Rhino-pharyngeal cancer

Introduction

Gemellae are catalase-negative and anaerobic to aerotolerant Gram positive cocci and may be found as part of the normal oropharyngeal microflora in humans. There are four species of *Gemellae*: *Gemella haemolysans*, *Gemella morbillorum*, *Gemella sanguinis* and *Gemella bergeriae*. These bacteria have little growth in blood agar and need 48 hours to be visible. Colonies are small and grayish and they may exhibit alpha-hemolysis on blood agar thus leading to initial presumptive identification as a *Streptococcus viridans* [1].

A positive L-pyrrolidonyl-, B-naphthylamide hydrolysis test can rapidly distinguish the isolate from a *Streptococcus viridans*. Other microbiological characteristics include susceptibility to vancomycin and negative reactions to oxidase and catalase.

In the last years, *Gemellae* emerged as a cause of sporadic severe infections such as endocarditis, liver abscess, meningitis, cerebral abscess, mediastinitis, and pericarditis [2-7]. In few cases these infections were associated with onco-hematologic diseases such as osteosarcoma, oral Burkitt's lymphoma or intestinal adenocarcinoma and *Gemellae*'s bacteremia have been suggested as a marker of suspicion of intestinal malignancy [8-10]. To our knowledge, 5 reports of septic shock caused by *Gemella* spp. have been published so far: 2 cases in Italian adults with AIDS [11], 2 cases in immunocompromised pediatric patients [12] and one case in an immunocompetent American adult patient with a retro-pharyngeal abscess [13].

Case Report

A 41-year-old man was admitted to the emergency department in a state of coma (Glasgow Coma Scale 5) with no neck stiffness, severe hypotension (systolic blood pressure 70 mmHg), high grade fever (39.5 °C), anuria, leukocytosis with neutrophilia (total white blood cells: 13100/μL), high C-reactive protein (22.1 mg/dl) and procalcitonin (147.64 ng/ml). The patient had undergone a recent etoposide-based salvage chemotherapy for a progressive undifferentiated neuroendocrine rhino-pharyngeal cancer, with local invasion (left para-pharyngeal space, peri and sub-mastoideal space, maxillary sinuses, clivus) and laterocervical and mediastinal lymph node involvement as well as pulmonary and hepatic metastasis. His cancer was first diagnosed in 2002 and relapsed in March 2010.

Chest radiography was negative and, due to the suspicion of a central nervous system infection, a lumbar puncture was performed. The analysis of the cerebrospinal fluid showed normal values for white blood cells, glycorrachia and proteinorrachia and the direct Gram stain and culture were negative. The patient was hospitalized in the infectious

Manuscript accepted for publication February 7, 2012

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doi:10.4021/jmc567w

diseases unit where a nutritional and supportive therapy was started via central venous catheter (inserted 30 days before), together with oxygen therapy via a reservoir mask and an empiric broad spectrum antibiotic therapy with intravenous meropenem (1 g tris in die) and vancomycin (1 g loading dose followed by 2 g as a 24 h continuous infusion). A purulent-like liquid flowed from his mouth and was collected and sent, together with urine and blood cultures, to the microbiology laboratory. Blood cultures were performed using the BacT/ALERT system (bioMerieux®, Marcy l'Etoile, France).

Despite initial improvement of blood pressure and diuresis, after 24 hours an acute respiratory failure occurred and respiratory assistance in C-PAP ventilation was initiated, with no substantial results. Meanwhile the microbiology laboratory informed us that 3 blood cultures were positive for gram positive cocci in the anaerobic bottles. The urine culture was negative while the oral pus culture was positive for alpha-hemolytic streptococci, Oxacillin sensitive *S. aureus* and *Candida albicans*: no change was made to the antibiotic therapy. The patient died 48 hours after admission due to an acute respiratory distress syndrome. No autopsy examination was performed.

The strain grown from the positive anaerobic bottle was identified as *Gemella* spp. using the ATB ID32A identification system (bioMerieux®, Marcy l'Etoile, France). Unfortunately the Vitek GP card was not tested due to the patient's exitus.

Discussion

This is a case of septic shock due to *Gemella* spp. due to a probable retropharyngeal cancer-abscess. An organism reported as an alpha-hemolytic *Streptococcus* was isolated from a pharyngeal swab and was, at first, considered to represent normal upper respiratory tract bacteria, which, in our centre, are not routinely identified further not excluding that the strain was not the same *Gemella* isolated in blood cultures. Nevertheless, the systemic infection did occur in conjunction with an oral infection as shown by the purulent fluid observed in the mouth and the previously reported severe oral mucositis. Unfortunately a CT-scan of the head and neck could not be performed due to the patient's poor condition and the hypothesis of a cancer-abscess of the rhinopharyngeal region could not be proved. As 2 of the 3 positive blood cultures were obtained from the central venous catheter puncture a concomitant infection of the central venous line could also be hypothesized. There was no biochemical and cultural evidence of bacterial invasion of the subarachnoid space, therefore the neurological manifestations could be consistent with toxic encephalopathy, indeed.

Elting, et al., studied some predisposing factors of septicemia and shock syndrome due to *viridans streptococci*

in an American cancer center and showed that 13% among all blood streptococcal isolates were *Gemella morbillorum*. In a multivariate analysis the authors identified the use of TMP-SMZ or fluoroquinolones prophylaxis, treatment with antacids or H2 antagonists and profound neutropenia as risk factors for developing a viridans streptococcal bacteremia but did not identify solid cancers [14].

Vancomycin should have guaranteed *in vitro* activity as no resistance to glycopeptides has been reported so far [15] and the exitus depended on the severe multi-organ failure already ongoing at admission.

As implementing standard oral care with an antibiotic paste was found to be effective in reducing alpha hemolytic streptococcal sepsis in immunocompromised children [16] we suggest that this standard of care could be useful in immunocompromised adults and that this bacteria may be considered as an opportunistic pathogen and more attention should be paid to prevent his spread in high risk patients.

Acknowledgment

The authors are grateful to Dr McDermott for her precious help in revising the article.

Conflict of Interest

The authors declare that no potential conflicts of interest are disclosed.

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