Capnocytophaga Bacteremia in Neutropenic Patients: Report of Two Cases

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Recently, several cases of blood-borne infections by Capnocytophaga species have been reported in immuno-compromised patients [1-5]. Although these microorganisms are an infrequent cause of bacteremia in neutropenic patients, we have recently observed two such infections, which occurred in our department within a short time period.

The first patient was a 63-year-old male with acute nonlympho-blastic leukemia, diagnosed in October 1991, who entered complete remission after appropriate induction chemotherapy. The patient’s condition was complicated by invasive pulmonary aspergillosis (IPA) successfully treated with itraconazole. His leukemia relapsed in February 1993, and salvage chemotherapy was delivered, using a protocol which includes intermediate-dose cytarabine, intermediate-dose methotrexate, vindesine, mitoxantrone and cyclophosphamide [6]. This treatment was further complicated by severe oral mucositis (grade IV according to the WHO classification), diarrhea (grade II) and severe vomiting (grade III). During the period of severe neutropenia (absolute neutrophil count < 0.5 × 10^9/1), which lasted 21 days, three blood cultures drawn from a peripheral vein (n = 1) and a central venous catheter (n = 2) during an initial febrile episode were positive for Escherichia coli and Capnocytophaga sp. Empirical antibiotic treatment with meropenem was instituted, with rapid clinical improvement and no further positive blood cultures. Fever later reappeared due to reactivation of the IPA, which again resolved with oral itraconazole and recovery of the neutrophil count.

In vitro susceptibility testing showed that Capnocytophaga was sensitive to penicillin, cephalosporins, imipenem, meropenem, fluoroquinolones, chloramphenicol and tetracyclines whereas it was resistant to aminoglycosides, vancomycin and trimethoprim-sulfamethoxazole.

The second patient was a 61-year-old female who suffered from advanced-stage low-grade non-Hodgkin’s lymphoma since 1980, and had received outpatient treatment with combination chemotherapy and involved-field
radiotherapy. She was admitted to our hospital in February 1993 because of generalized bone pain secondary to bone marrow infiltration by diffuse large-cell lymphoma. With the diagnosis of transformation of her previous low-grade lymphoma, treatment with a salvage combination chemotherapy protocol which includes ifosfamide, cytarabine, etoposide and prednisone [7] was delivered. During the period of severe neutropenia she developed a fever, and two blood cultures yielded Capnocytophaga sp., with the same in vitro susceptibility profile as the previous case. Empirical antibiotic treatment with ceftazidime and amikacin was instituted; the fever disappeared within 24 h and successive blood cultures were sterile. Although the patient did not develop mucositis, she showed signs of extensive periodontal disease. Capnocytophaga spp. are fusiform, gram-negative, capnophilic and facultatively anaerobic rods that are usually found in the normal oral flora [2] and are involved as pathogens in periodontal disease [8]. Species identification by conventional methods is difficult and is not routinely performed in the clinical microbiology laboratory, as in our two cases [3, 9].

These bacteria have recently been reported as opportunistic pathogens causing bacteremia in immunocompromised hosts, especially in neutropenic patients with concomitant oral pathology following chemotherapy and/or radiotherapy [1,3,4]. As usually occurs in this setting, antibiotic prophylaxis can potentially inhibit the sensitive gastrointestinal flora and promote the growth of resistant microbial species [2]. This mechanism was probably of little importance in our patients since both had received nor-floxacin (400 mg q 12 h) for intestinal decontamination, and both isolates were susceptible to this agent. The presence of severe neutropenia, the severe gastrointestinal mucositis present in the first patient and the periodontal disease observed in the second case were probably the mechanisms involved in the development of these blood-borne infections. We do not have an adequate explanation for the almost simultaneous occurrence of these two bacteremias, but interpatient transmission through the medical or nursing staff or environmental factors seems highly unlikely.

Although infrequently, Capnocytophaga infections can also affect nonimmunocompromised and nonneutropenic hosts (bacteremias, lung infections, sinusitis, osteomyelitis, abdominal infections, etc.), usually as part of polymicrobial infections [4,8]. Most strains of Capnocytophaga are susceptible to penicillin, cephalosporins, imipenem, fluoroquinolones, chloramphenicol and tetracyclines and are resistant to aminoglycosides, vancomycin and cotrimoxazole [2, 4], although β-lactamase-producing strains are not infrequent [10]. Both of our isolates were susceptible to β-lactam antibiotics, with a favorable clinical and microbiological outcome after empirical treatment with meropenem and ceftazidime and no signs of organ infection. We conclude that Capnocytophaga must be added to the long list of opportunistic gram-negative bacteria found in patients submitted to intensive chemotherapy and/or radiotherapy, especially when mucosal lesions are present. Most empirical antibiotic treatments used in this setting, however, include agents effective against these relatively rare infections (i.e., imipenem, meropenem, ceftazidime), and their outcome is usually good.

References