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Bloodstream Infections in Febrile Neutropenic Children with Cancer

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Background: The treatment of febrile neutropenia is an emergency which is based on each Institution's epidemiology.
Objective: To evaluate clinical and epidemiologic features of bloodstream infections (BSI) and sensibility profile of main agents and identifies risk factors related mortality.
Methods: All positive blood cultures from January 1st 2004 to 31st December 2006 were evaluated retrospectively. Patients with cancer submitted to chemotherapy, younger than 21, with absolute neutrophil ($<$500 cell/mm^3) and fever were included. Patients submitted to bone marrow transplant and fever related to transfusion reaction, were excluded. Statistical analysis was done by SPSS program; $p<0.05$ was considered significant.
Results: Four hundred and two BSI were reported but only 153 episodes were analyzed; 55% were male, 76% were $>$3 years, 20% were in CTI, 57% had a CVC and 17% were submitted to surgery. 95.6% were represented by bacteria, 4.4% were fungi. Gram-negative rods caused 54.3%. Most common agents were: Gram-negative *E. coli* (37%), *K. pneumonie* (15%) and *Acinetobacter spp.* (14%) and Gram-positive cocci were Coagulase Negative *Staphylococci* (40%), *S. aureus* (19%) *S. viridans* (17%). 77% of Coagulase Negative *Staphylococci* were resistant to oxacilin and 67% to clindamycin. All *S. aureus* were sensibly to oxacilin. *K. pneumoniae* presented high resistant levels to cephalosporins (38% to ceftriaxone, 43% to ceftazidime and 36% to cefepime) and 43% were ESBL. Gram-negative rods (95 episodes) were analyzed together and were observed low resistance to polymyxinB (0%) and to piperacillin/tazobactam (3%) against high resistance to cephalosporins (17% to cefepime, 19% to ceftazidime and 22% to ceftriaxone). The overall mortality rate within 30 days from the first positive blood culture was 12.4%. Multivariate logistic regression demonstrated that presence of organic dysfunction (severe sepsis and septic shock) and inappropriate initial antibiotic therapy were independently associated to mortality (OR 9.42 and 11.46, respectively).
Conclusions: Gram-negative bacteria presented high resistance to antibiotics commonly used in our institution. The presence of organic dysfunction and inappropriate initial antibiotic therapy were associated to mortality. Results confirm the importance of knowing local epidemiology for the best treatment then reducing mortality.

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Emergence and Control of an Outbreak of *Clostridium difficile* BI/NAP1/027 strain in a Comprehensive Cancer Center

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Background: *Clostridium difficile* infection (CDI) was considered a mild nosocomial disease associated almost exclusively with the use of antibiotics, but its epidemiology has changed dramatically. Since 2002, outbreaks of severe CDI with a new strain BI/NAP1/027 have emerged and were associated with increased mortality and reduced effectiveness of standard therapy. However, there is lack of data about the epidemiology of this new virulent strain in cancer centers.
Objective: To describe an outbreak of *C. difficile* BI/NAP 1/027 strain and the impact of multifaceted infection control measures.
Methods: We implemented in past years an active surveillance program for CDI that allows us to collect and review the microbiology records of all patients with positive *C. difficile* toxin in stools. As part of this active surveillance, an outbreak was identified in May of 2007. *C. difficile* isolates were cultured on cyloserine-cefoxitin-fructose agar and polymerase chain reaction (PCR) was used to identify the presence of binary toxin, a marker of the BI/NAP1/027 strain.
Results: During 2007, there were 321 cases of CDI with an average rate of 0.86/1000 patient-days. Since March of 2007, we evidenced an increase in the rate of CDI from 0.38 in February to 0.72 in March with a peak rate of 1.92 in May of 2007 ($p<0.05$). An outbreak team was convened and an action plan was developed. Mainly, education measures were implemented on floors and new signs were placed on isolation carts reinforcing hand hygiene procedures with the use of water of soap, environmental cleaning with 10% bleach, and reinforcing the use of personnel protective equipment. As a result, the rate of CDI decreased progressively to 0.44 in November 2007. Three clusters of patients with CDI, in different location each, were identified during the outbreak necessitating additional education and environmental cleaning in the affected areas. Since May 2007, we were able to isolate 25 *C. difficile* strains from patients with CDI. Moreover, we have also confirmed for the first time in our Institution the presence of *C. difficile* BI/NAP 1/027 binary toxin in 6 cases.
Conclusion: We were able to confirm the change in the epidemiology of CDI in our institution with the development of an outbreak secondary to the emergence of the new hypervirulent strain BI/NAP1/027. Infection control measures were the cornerstone to control this outbreak in this immunocompromised population.

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Clinical Characteristics and Virulence Factors of *Escherichia coli* Pyomyositis: A New Entity in our Patients with Hematologic Malignancies

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Background: Pyomyositis is an acute bacterial infection of the skeletal muscle typically caused by *Staphylococcus aureus*. Few cases have been described of *Escherichia coli* pyomyositis and the associated virulence factors have not been studied.
Objective: To describe the clinical features, the phylogeny and the virulence factors of *E. coli* pyomyositis.
Methods: After reviewing the microbiology database and medical records of all *E. coli* isolated in our institution (2003–2007), six cases of *E. coli* pyomyositis were identified. Clinical characteristics of the disease, laboratory and radiologic findings, treatment and outcome information were collected. Phylogeny and fifty-one virulence factors of the isolates were analyzed using PCR.
Results: The mean age was 53 years old with a 1:2 female/male ratio. All cases had a hematologic malignancy, were receiving