

Revista de Epidemiologia e Controle de Infecção



CASE REPORT

Multiple healthcare-associated infections in a patient with Crohn's disease: Case report *Múltiplas infecções relacionadas à assistência em saúde em paciente com doença de Crohn: Relato de caso*

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Recebido em: 13/12/2015

Aceito em: 23/03/2015

Disponível online: 04/04/2016

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DESCRITORES

Doença de Crohn;
MRSA;
Pseudomonas;
Klebsiella.

KEYWORDS

Crohn's disease;
MRSA;
Pseudomonas;
Klebsiella.

RESUMO

Objetivos: Infecções relacionadas à assistência em saúde (IRAS) são a principal causa de morte em indivíduos hospitalizados no mundo, associada a doenças preexistentes e procedimentos invasivos. O presente estudo objetivou determinar IRAS em indivíduo imunossuprimido com doença de Crohn e o perfil de resistência antimicrobiana dos micro-organismos isolados. **Descrição do caso:** Um homem de 33 anos de idade com doença de Crohn foi admitido em um hospital para enterostomia e colecistectomia, com febre e sangramento gastrointestinal. Infecções no trato urinário, na corrente sanguínea e associadas com cateter vascular foram avaliadas, coletando-se urina, sangue e secreções de cateteres, individualmente plaqueadas em meios específicos para identificação direta e antibiograma em VITEK® 2. Duas diferentes amostras de cateter vascular central (CVC) e hemocultura revelaram cepas de *Staphylococcus aureus*, com fenótipos de resistência a macrolídeos, lincosamídeos e estreptogramina B (MLS B) e meticilina (MRSA), e uma indicação de VISA (Vancomycin-intermediate *S. aureus*). *Pseudomonas aeruginosa* produtora de β -lactamase e *P. luteola* foram detectadas em pontas de cateteres (CVC) com diferentes padrões de resistência, enquanto *Trichosporon asahii* e *Klebsiella pneumoniae* (resistentes a ciprofloxacino/levofloxacino) foram isoladas de urina. Amicacina, meropenem, polimixina B, piperacilina/tazobactam, ciprofloxacino, cefepime e anfotericina B foram administradas neste paciente. **Conclusões:** O paciente sobreviveu mesmo após infecções múltiplas com patógenos usualmente envolvidos em IRAS e mortalidade em hospitais brasileiros.

ABSTRACT

Objectives: Healthcare-associated infections (HAIs) are the leading cause of death in hospitalized individuals worldwide, associated to preexisting diseases and invasive procedures. This study aimed to determine HAIs in an immunosuppressed individual with Crohn's disease and the antimicrobial resistance profile of the isolated microorganisms. **Case description:** A 33-year-old male individual with Crohn's disease was admitted to a hospital for enterostomy and cholecystectomy with fever and gastrointestinal bleeding. Infections in urinary tract, bloodstream and associated with vascular catheter were evaluated by collecting urine, blood and catheter secretions, individually plated on specific means for direct identification and antimicrobial sensitivity testing in VITEK® 2. Two different samples from the central venous catheter (CVC) and blood cultures disclosed the presence of *Staphylococcus aureus* with phenotypes of resistance to macrolides, lincosamides and streptogramin B (MLS B) and methicillin (MRSA), as well as an indication of VISA (vancomycin-intermediate *S. aureus*). *Pseudomonas aeruginosa* producing β -lactamase and *P. luteola* were detected in the tips of the catheters

R Epidemiol Control Infec, Santa Cruz do Sul, 6(2):104-106, 2016. [ISSN 2238-3360]

Please cite this article in press as: OLIVEIRA JÚNIOR, Jorge Bélem et al. Multiple healthcare-associated infections in a patient with Crohn's disease: Case report. Revista de Epidemiologia e Controle de Infecção, Santa Cruz do Sul, v. 6, n. 2, abr. 2016. ISSN 2238-3360. Disponível em: <<https://online.unisc.br/seer/index.php/epidemiologia/article/view/6850>>. Acesso em: 10 jan. 2017. doi:<http://dx.doi.org/10.17058/rev.v6i2.6850>.



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(CVC) with different resistance patterns, whereas *Trichosporon asahii* and *Klebsiella pneumoniae* (resistant to ciprofloxacin/levofloxacin) were isolated from urine samples. Amikacin, meropenem, polymyxin B, piperacillin / tazobactam, ciprofloxacin, cefepime and amphotericin B were administered in this patient. **Conclusions:** The patient survived even after multiple infections with pathogens usually involved in HAIs and mortality in Brazilian hospitals.

INTRODUCTION

The incidence of healthcare-associated infections (HAIs) worldwide is high and it is associated with long-term hospitalization, invasive procedures and the indiscriminate use of antimicrobials, contributing to increases in costs and mortality in hospitalized individuals.¹ *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli*, *Acinetobacter baumannii* and *Pseudomonas aeruginosa* are considered as the major pathogens involved in hospital infections.^{2,3} These agents are colonizers and the cause of opportunistic infections in wounds and bloodstream in Brazilian hospitals, becoming a challenge to health professionals.⁴

Individuals with Crohn's disease (CD) have a chronic inflammation in bowel areas or subjacent organs, with development of ulcers, intestinal wall thickening and granulomas in the mucosa, progressing to bleeding, stenosis, intestinal perforation, fistulas and perianal abscesses. The etiology is unknown and theories that have emerged involve bacterial infections, immunological and genetic factors, psychological and nutritional disorders, gastrointestinal allergy and environmental factors.⁵ The most common symptoms are abdominal pain, bowel obstruction and diarrhea, often prompting individuals affected to corrective surgeries and long hospitalization periods, which increases the risk of infections.^{5,6} The aim of this work was to evaluate and to describe an interesting case of a patient with DC and multiple HAIs, when microorganisms were isolated in different clinical specimens in a short period.

CASE REPORT

A 33-year-old male patient diagnosed with CD (ICD K50), confirmed earlier by computerized tomography scan of the lower abdomen and abdominal ultrasound, was submitted to laparotomy due to entero-cutaneous fistula. After five months, he returned to a university hospital in Maceió (Alagoas, Brazil) with complications to perform enterostomy and conventional cholecystectomy. Physical examinations confirmed postoperative fever and gastrointestinal bleeding, whereas laboratory investigations revealed iron deficiency anemia, intravascular coagulation and sepsis, leukocytosis and neutrophilia, leading the patient to the Intensive Care Unit (ICU) for six months in almost 1 year of hospitalization with use of central vascular catheter (CVC) and urethral catheter. Urine was plated on CLED, while blood and secretions of catheter tips in 5% sheep blood agar (24h at 35±1°C). Bacterial cultures were used for identification and susceptibility testing to antibiotics in automated system

VITEK® 2 (bioMérieux).

During the first month, two different samples of the catheter tip (CVC placed through right internal jugular vein; IJV) collected with a twelve-day difference and hemoculture revealed three strains of *S. aureus* resistant to macrolide-lincosamide-streptogramin B (MLS B) and oxacilin (*Methicillin-resistant S. aureus*; MRSA), with the VISA phenotype (Vancomycin-intermediate *S. aureus*) in one strain, based on VITEK® 2 results. In the first catheter tip sample from IJV with *S. aureus*, the Gram-negative bacterium (GNB) *P. luteola* was also isolated, with resistance to amikacin, gentamicin, ciprofloxacin and aztreonam. In the following month, *P. aeruginosa* producer of beta-lactamases was also recovered from the other catheter tip sample, presenting high resistance against imipenem, meropenem, cefotaxime and aztreonam. The yeast *T. asahii* and the GNB *K. pneumoniae* were isolated from a unique urine sample. The bacterium presented resistance to ciprofloxacin and levofloxacin, but susceptibility to amikacin and meropenem, antimicrobials administered to this patient in addition to polymyxin B, tazocin, amphotericin B, cefepime and ciprofloxacin. Three months after the initial symptoms of sepsis, the patient had clinical recovery. The patient consented the use of the data in the report.

Most of the patients with Crohn's disease are diagnosed with bacterial or parasitic process and therapeutic options for CD include corticosteroids, antibiotics, immunosuppressive agents and infliximab (a TNF inhibitor), which affects the immune system and increases the risk for serious or fatal infections.⁷

Central vascular catheter (CVC) is required for prolonged access to the vascular system, and represents a risk factor for bacteremia, and in our patient it was possible to isolate strains of *S. aureus*, *P. aeruginosa* and *P. luteola* from catheter tip samples. *S. aureus* is an important agent of opportunistic infection, causing 20% of bacteremia in Brazil and colonizing 30% of healthy individuals, and MRSA strains have a significant impact on mortality.^{2,8} Automated systems can be used for the detection of MRSA, but do not detect VRSA, VISA or h-VISA properly, total resistance, intermediary and heterogeneous, respectively.⁹ Therefore, an MRSA strain cannot be confirmed as VISA or h-VISA only through VITEK® 2.

The acquisition of *P. aeruginosa* in ICUs is associated to the exposure to invasive procedures. CVC and urinary catheter, in addition to prolonged stay in the ICU, contribute to an increased risk of HAIs with multidrug-resistant strains, including β -lactamases producers.³ However, *P. luteola* is a rare pathogen in humans despite being ubiquitous and reported in several unrelated diseases such as colon cancer, peritonitis and catheter-related

infection.¹⁰ *Klebsiella* sp. represents 18.7% of cases of nosocomial infection after *Pseudomonas* sp. (24.6%), and strains resistant to carbapenems make the treatment more difficult.⁴ However, in our work, the patient had *K. pneumoniae* sensitive to ertapenem and meropenem, but resistant to ampicillin, quinolones/fluoroquinolones and aminoglycosides.

Fungi can also generate recurrent complications in hospitals, and genera such as *Aspergillus* sp., *Fusarium* sp. and *Penicillium* sp. are considered opportunists with a high risk for hospitalized patients, although Fagundes et al. indicate *T. asahii* as the major causative fungus of nosocomial infections, with 71% of the cases of urinary tract infection in male patients. It is a fungus traditionally described in opportunistic infections in urinary tracts, with increased infection rate due to prolonged use of probes and catheters, as is the case herein described.¹¹

All species identified are commonly associated to nosocomial infections worldwide and contribute to the increase in morbi-mortality of immunocompromised individuals.^{4,6} On the other hand, the patient presented here survived after antimicrobial therapy against multiple infections in a short period.

CONCLUSION

The patients with Crohn's disease are likely to acquire nosocomial infections, due to the severity of the disease and invasive procedures performed. The isolation of MRSA, *P. aeruginosa* and *K. pneumoniae* in this patient confirmed the major causative agents of healthcare-associated infections. Therefore, it is necessary to make the correct microbial identification and give special attention to the selection of antimicrobial agents for empiric treatment, preventing the increase of multi-drug-resistant strains and ensuring the survival of the patient.

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