Antimicrobial Resistance and Research Programme (DANMAP) and was sponsored by the Danish Ministry for Family and Consumer Affairs.

Transparency declarations

None to declare.

References


Journal of Antimicrobial Chemotherapy

doi:10.1093/jac/dkl036
Advance Access publication 13 February 2006

Inter-country transfer of Gram-negative organisms carrying the VIM-4 and OXA-58 carbapenem-hydrolysing enzymes

Anton Y. Peleg1*, Jan M. Bell2, Ann Hofmeyr3 and Peter Wiese3

1Victorian Infectious Diseases Service, Royal Melbourne Hospital, Melbourne, Australia; 2Microbiology and Infectious Diseases Department, Women’s and Children’s Hospital, Adelaide, Australia; 3Microbiology Department, Royal Melbourne Hospital, Melbourne, Australia

Keywords: metallo-β-lactamases, carbapenemases, Acinetobacter baumannii, Pseudomonas aeruginosa

*Corresponding author. Tel: +61-3-9342-7000; Fax: +61-3-9342-7277; E-mail: antonpeleg@iprimus.com.au

Sir,

The widespread dissemination of acquired carbapenem-hydrolysing enzymes, particularly Ambler classes B [metallo-β-lactamases (MBLs)] and D (oxacillinases), is of great clinical concern. Of the MBLs, the IMP and VIM types are the most frequent, with more than 20 countries reporting their presence. The VIM-4 enzyme was first described from a Pseudomonas aeruginosa isolate from Larissa, Greece, and, soon after, an outbreak occurred at that institution. The blaVIM-4 gene has also been reported from Italy and Poland, but thus far there have been no reports from Australia. The class D carbapenemases are now divided into four distinct phylogenetic clusters: OXA-23 (OXA-23 and OXA-27), OXA-24 (OXA-24, OXA-25, OXA-26 and OXA-40), OXA-58 and OXA-51. OXA-58 has recently been shown to contribute significantly to carbapenem resistance in Acinetobacter baumannii, especially when additional efflux mechanisms are expressed. This enzyme has now been reported from France, Spain, Turkey and Romania, and, more recently, from Australia and Greece. The role of international travel in the global dissemination of carbapenemase genes is often reported, but rarely has this been well illustrated.

In October 2005, a 35-year-old female underwent an inter-hospital, inter-country transfer from an intensive care unit (ICU) in Athens, Greece, to our ICU. Five weeks before she had been hit by a car while walking and sustained multiple injuries, including an intra-cranial haemorrhage and long bone fractures. She remained in the ICU in Greece until transfer and was intubated and ventilated for 23 days. On arrival the patient had a central venous catheter (CVC), a radial arterial line, a urinary catheter and a tracheostomy in situ. Within 12 h of transfer, high fever developed with no clinical source of infection identified. Blood and urine cultures were obtained. Vascular lines and the urinary catheter were removed, empirical teicoplanin and tobramycin were started and strict infection control precautions were initiated.

The following day, P. aeruginosa was identified from urine cultures in the absence of significant pyuria. Susceptibility testing was performed using broth microdilution according to CLSI standards. The isolate was susceptible only to polymyxin B and was resistant to meropenem (MIC > 8 mg/L), imipenem (MIC > 8 mg/L), aztreonam (MIC > 16 mg/L), gentamicin (MIC > 8 mg/mL), tobramycin (MIC > 16 mg/L), amikacin (MIC > 32 mg/L), cefazidime (MIC > 16 mg/L), piperacillin/tazobactam (MIC > 64 mg/L), ticarcillin/clavulante (MIC > 128 mg/L) and ciprofloxacin (MIC > 4 mg/L). The CVC tip cultures were also positive for a carbapenem-resistant A. baumannii, and this was soon followed (>2 h) by positive peripheral blood cultures for the same organism. These isolates were resistant to all tested antibiotics except for polymyxin B. The patient became afebrile within 72 h and all antibiotics were ceased. Recovery was made and no further infective complications ensued. Nosocomial transmission was not identified.

An Etest® MBL (AB Biodisk, Solna, Sweden) was performed on both Gram-negative genera, with the P. aeruginosa isolate testing positive according to the manufacturer’s guidelines. To confirm the mechanism of carbapenem resistance the isolates underwent PCR testing for the detection of blaIMP and blaVIM MBL genes and class D carbapenemase genes (OXA-23 and OXA-24 cluster and OXA-58). Amplification products were identified for blaVIM in the P. aeruginosa isolate and blaOXA-58 in the A. baumannii isolate. Nucleotide sequencing confirmed the presence of the blaVIM-4 and blaOXA-58 genes in the P. aeruginosa and A. baumannii isolates, respectively, with a complete sequence identified for each gene.

794
Correspondence

1 Cell and Gene Therapy, Baylor College of Medicine, Houston, TX 77030, USA; 2 Division of Hematology/Oncology and Bone Marrow Transplant, Department of Internal Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK 73104, USA

Keywords: cytopenia, antibiotics, neutropenia

We would like to thank the physicians who cared for the patient and the microbiology staff at the Royal Melbourne Hospital for their processing of the specimen.

Acknowledgements

We would like to thank the physicians who cared for the patient and the microbiology staff at the Royal Melbourne Hospital for their processing of the specimen.

Transparency declarations

None to declare.

References


Delayed myeloid engraftment due to vancomycin in allogeneic haematopoietic stem cell transplant recipients

Rammurti T, Kamble 1*, Mehdi Hamadani 2 and George B. Selby 2

Sir,

In haematopoietic transplantation, myeloid and megakaryocytic engraftment typically occurs in tandem at a median of 15 days (range = 5–41 days). 1 Various factors, including the age of the recipient, stem cell dose (CD34+ cells), source of stem cells (bone marrow versus mobilized blood stem cells), degree of HLA matching, administration of colony stimulating factors, T cell depletion and infections, are known to affect the process of engraftment. 1, 2 Vancomycin is commonly used during the course of haematopoietic transplantation. Although vancomycin-induced neutropenia has been reported, 3, 4 in the presence of other confounding factors such as infection, sepsis and other antibiotics, a direct causal relationship may be difficult to establish. We herein report a case of rapid megakaryocytic engraftment with normalization of platelet counts in the absence of myeloid engraftment and restoration of myeloid haematopoiesis following discontinuation of vancomycin.

A 59-year-old male received a non-myeloablative allogeneic haematopoietic stem cell transplant (allo-SCT) for intermediate risk (normal cytogenetics) acute myelogenous leukaemia (AML-M4) in first complete remission (CR1) from a 6/6 HLA-matched unrelated donor. A total of 6.1 × 106 CD34+ cells were infused following sub-ablative conditioning (busulfan 0.8 mg/kg every 6 h x 2 days, fludarabine 30 mg/m2 x 3 days and alemtuzumab 10 mg × 5 days). Graft versus host disease (GVHD) prophylaxis was performed with a short course of methotrexate (10 mg/m2 on day +1; 5 mg/m2 on day +3; and 5 mg/m2 on day +6) and tacrolimus. The transplant course was uncomplicated except for a catheter-insertion-site infection on day +12, for which intravenous vancomycin (1 g every 12 h) was initiated. The peak and trough vancomycin levels were 27.1 mg/L (range = 30.0–40.0 mg/L) and 8.4 mg/L (range = 5.0–10.0 mg/L), respectively. The patient remained afebrile, blood cultures were negative and he did not receive any other antibiotic. Figure 1 demonstrates the neutrophil and platelet nadir along with the haematopoietic reconstitution. Megakaryocytic engraftment (platelets >20,000/DL × 3 consecutive days in the absence of transfusion) occurred on day +10 without myeloid engraftment. On day +18 colony stimulating factor (G-CSF; 480 µg subcutaneously daily) was initiated. On day +19 the platelet count was 160,000/DL without any evidence of myeloid engraftment (neutrophils = 2, WBC = 100/DL). On day +21, vancomycin was discontinued; myeloid engraftment occurred on day +23 (13 days after megakaryocytic engraftment). An absolute lymphocyte count (ALC) at myeloid engraftment was 18 cells/mm3. Lymphocyte recovery (ALC ≥ 500 cells/mm3) occurred in 70 days. Engraftment studies on day 30 confirmed 99.5% donor chimerism. Pre-emptive ganciclovir was initiated for cytomegalovirus (CMV) antigenaemia.