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ePoster Viewing

Clinical ID: infection in the immunocompromised host and transplant recipients

The epidemiology and predictors of bloodstream infection in patients with myeloma in the absence of antibacterial prophylaxis

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Objectives
Infections are a leading cause of morbidity and mortality in patients with multiple myeloma (MM). Our study aimed to define the epidemiology and clinical predictors of bloodstream infection (BSI) in patients with MM receiving immunomodulatory agents, proteasome inhibitors (PI) and autologous hematopoietic stem cell transplant (ASCT) as the current standard of care.

Methods
Patients with MM diagnosed between Jan 2008 to December 2012 who received management at Peter MacCallum Cancer Centre were identified from electronic chemotherapy prescribing and medical management databases. Clinical and microbiology records of eligible patients were reviewed using a standardised tool to capture patient demographics, myeloma characteristics (type, stage, therapy), and BSI characteristics (type, severity, outcomes). BSIs were defined according to Centers for Disease Control/National Healthcare Safety Network criteria. Routine antibacterial prophylaxis was not administered at the study centre during the studied period. Conditional risk set modelling for multivariate survival data was used to determine clinical predictors of BSI.

Results
182 patients with MM with 90 episodes of BSI were identified. Patients had a median age of 63 years, most commonly having IgG myeloma (53.3%) and ISS stage 1 (45.6%). Patients were followed for a median of 31 months. Quarterly incidence rates for BSI in the first year following MM diagnosis were 1.7, 6.2, 2.2 and 2.0 episodes per 100 patient-years, respectively. BSI occurred most commonly during stem cell mobilisation and ASCT 55/90 (61.1%) and 66 (73.3%) episodes were associated with neutropenia. Of all episodes, 32 (35.6%) were due to gram-positive (GP) organisms, 35 (38.9%) were due to gram-negative (GN) organisms, and 23 (25.6%) were due to polymicrobial infection. Of infections due to a single pathogen, *Escherichia coli* was most commonly isolated (19/90), followed by *Streptococcus* spp. (14/90, including S. *pneumoniae* bacteraemia in 6 instances) and coagulase-negative Staphylococcus spp. (8/90). S. *pneumoniae* bacteraemia occurred a median of 19 months following myeloma diagnosis. 6 infections were due to multi-resistant pathogens. 9 episodes required management in the ICU with median length of stay 2 days. ICU admission rates were 9.4%, 5.7% and 17.4% for GP, GN and polymicrobial infections, respectively. Overall 30-day mortality was 5.6%. Of myeloma treatment factors, receipt of cyclophosphamide and melphalan for ASCT (HR 22.1; 95% CI 2.8-173.1, $p<0.01$) and intensive combination conventional chemotherapy (HR 33.5; 95% CI 3.5-324.1, $p<0.01$) were significantly associated with increased risk of BSI.

Conclusions
In patients with myeloma, the incidence of BSI is highest in the period between 3 and 6 months following diagnosis, coinciding with stem cell mobilisation and ASCT. GN organisms cause the majority of infections. In the absence of antibacterial prophylaxis, multi-resistant organisms and ICU admissions for GN infections remain low. The association between BSI and conventional chemotherapeutic agents requires further prospective evaluation.