

MEANINGFUL METRICS FOR ANTIFUNGAL STEWARDSHIP USING PATIENT LEVEL DATA ON INVASIVE MOLD DISEASES DERIVED FROM NATURAL LANGUAGE PROCESSING OF CHEST COMPUTED TOMOGRAPHY (CT) REPORTS

Authors:

Baggio D^{1,2}, Avery S², Wei A², Haffari G³, Peleg A^{1,4}, Morrissey CO¹, Ananda-Rajah MR^{1,5}

¹Department of Infectious Diseases, Alfred Health, Monash University, Melbourne, Victoria, Australia

²Malignant Haematology and Stem Cell Transplantation Service, Alfred Health, Melbourne, Victoria, Australia

³Faculty of Information Technology, Monash University, Melbourne, Victoria, Australia

⁴Biomedicine Discovery Institute, Department of Microbiology, Monash University, Melbourne, Victoria, Australia

⁵General Medicine Unit, Alfred Health, Melbourne, Victoria, Australia

Introduction:

Evaluation of antifungal stewardship (AFS) is hampered by a lack of patient level data on invasive mold disease (IMD) in hospitals. The aim of this study was to characterise the epidemiology of IMD and to explore metrics of relevance to AFS.

Methods:

We identified haematology-oncology and haemopoietic stem cell transplant (HSCT) patients with IMD at Alfred Health from January 2010 to August 2016, by screening chest CT reports with natural language processing followed by expert medical review. Host, microbiological and antifungal drug characteristics were manually extracted.

Results:

There were 156 IMD-episodes in 144 patients being probable/proven in 37%, with *Aspergillus* and non-*fumigatus* species accounting for 68% and 22% of isolates respectively. Underlying disease was acute myeloid leukaemia (56%), acute lymphoblastic leukaemia (ALL, 15%), lymphoma (8.3%), multiple myeloma (8.3%), myelodysplastic syndrome (3.8%), chronic lymphocytic leukaemia/small lymphocytic lymphoma (3.2%), and post-HSCT (33%). Poor prognosis disease (refractory/progressive, relapse) underpinned 42% of IMD-episodes. Breakthrough IMD despite antifungal prophylaxis (AFP) occurred in 89 (58%) episodes. Among 67 IMD-episodes lacking AFP, 37% occurred post-HSCT with 64% occurring >100 days post-allogeneic HSCT (median 364 days). Of these, 5 patients had graft vs host disease. In 15 IMD-episodes among pre-transplant ALL patients, one patient did not receive prophylaxis and 14 represented breakthrough IMD associated with intermittent liposomal amphotericin prophylaxis in 10 episodes (71%).

Conclusion:

IMD surveillance facilitated by technology can strengthen AFS by delivering the granularity essential for identifying gaps in practice and groups who may benefit from AFP or from heightened vigilance months after intensive treatment.

Disclosure of Interest Statement:

The authors have no conflicts of interest to disclose relevant to the contents of this study.