Causative Pathogens of Febrile Neutropaenia in Children Treated for Acute Lymphoblastic Leukaemia

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Abstract

Introduction: Treatment of acute lymphoblastic leukaemia (ALL) using intensive chemotherapy has resulted in high cure rates but also substantial morbidity. Infective complications represent a significant proportion of treatment-related toxicity. The objective of this study was to describe the microbiological aetiology and clinical outcome of episodes of chemotherapy-induced febrile neutropaenia in a cohort of children treated for ALL at our institution.

Materials and Methods: Patients with ALL were treated with either the HKSGALL93 or the Malaysia-Singapore (Ma-Spore) 2003 chemotherapy protocols. The records of 197 patients who completed the intensive phase of treatment, defined as the period of treatment from induction, central nervous system (CNS)-directed therapy to reinduction from June 2000 to January 2010 were retrospectively reviewed.

Results: There were a total of 587 episodes of febrile neutropaenia in 197 patients, translating to an overall rate of 2.98 episodes per patient. A causative pathogen was isolated in 22.7% of episodes. An equal proportion of Gram-positive bacteria (36.4%) and Gram-negative bacteria (36.4%) were most frequently isolated followed by viral pathogens (17.4%), fungal pathogens (8.4%) and other bacteria (1.2%). Fungal organisms accounted for a higher proportion of clinically severe episodes of febrile neutropaenia requiring admission to the high-dependency or intensive care unit (23.1%). The overall mortality rate from all episodes was 1.5%.

Conclusion: Febrile neutropaenia continues to be of concern in ALL patients undergoing intensive chemotherapy. The majority of episodes will not have an identifiable causative organism. Gram-positive bacteria and Gram-negative bacteria were the most common causative pathogens identified. With appropriate antimicrobial therapy and supportive management, the overall risk of mortality from febrile neutropaenia is extremely low.