

The epidemiology and investigation of invasive fungal disease in paediatric patients with Burkitt Lymphoma in Ireland

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Introduction

- Invasive fungal disease (IFD) is a major cause of morbidity and mortality among paediatric patients with a hematological malignancy.
- Anti-fungal prophylaxis has been shown to reduce morbidity and mortality in high-risk groups.
- There is a lack of data on the incidence of IFD in paediatric patients with Burkitt lymphoma (BL).

Aims

- To describe invasive fungal infection rate and epidemiology in patients with BL attending a tertiary paediatric hospital. This will help to determine if prophylaxis for fungal infections is warranted in this group.
- The secondary aim of the audit is to compare the investigation and management of invasive fungal disease in our hospital with the consensus definitions described by the Infectious Diseases Group of the European Organization for Research and Treatment of Cancer and the Mycoses Study Group ((EORTC/MSGERC) in 2020.

Methods

- A retrospective audit was conducted of paediatric patients with a diagnosis of BL over 10 years (2012-2022). The sample size was 38 and there were no exclusion criteria.
- Data was collected from the electronic radiology and laboratory systems at CHI in Crumlin.
- Data collected for each patient included; age (at diagnosis), gender, cancer diagnosis and treatment protocol, host factors associated with fungal disease if present (e.g. neutropenia, allogenic SCT, haematological malignancy, solid organ transplant, prolonged use of corticosteroids), investigations for fungal disease including fluid cultures, PCR for fungal nucleic acid, histology, relevant imaging, treatment with anti-fungal therapy.
- Standard used to compare our practice was the current EORTC/MSGERC consensus definitions for investigation and diagnosis of IFD.

Results

- Thirty-eight patients were included in the study.
- There were three times as many males in the data set as females. Age range was between 2.2 years and 15.6 years at diagnosis. Three patients had previous solid organ transplant (Table 1).

No of patients	38
Sex	M=29 F=9
Average age at diagnosis	8.5 years (range 2.2-15.6 years)
Previous solid organ transplant	3

Table 1 - demographic data of patients with Burkitt lymphoma diagnosed 2012-2022.

- None of the patients reached the criteria for proven, probable or possible IFD.
- Four of the 38 patients (10.5%) were investigated for IFD and treated empirically with liposomal amphotericin B during an episode of febrile neutropenia (figure 1).
- Peripheral and central line cultures were negative in all four patients. None of these patients had bronchoalveolar fluid, cerebrospinal fluid, biopsy or other histopathological tissue taken for fungal culture or microscopic analysis. Serum biomarkers (beta-D-glucan and/or galactomannan assay) and aspergillus PCR were tested in three out of four of these patients and were negative. None of these four patients had radiological evidence of IFD.

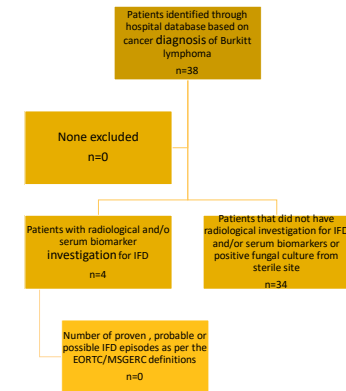


Figure 1 - A flow chart depicting the patient selection and main results of the audit.

Conclusion

- The results of this audit suggest that our population of paediatric patients with BL are not at high risk of IFD and thus routine antifungal prophylaxis is not indicated.
- An important study limitation was that it was not recorded whether patients received prophylaxis. While routine prophylaxis would not have been recommended during the study period, prophylaxis may have been prescribed for some patients based on physician preference.
- Our results will help inform local practice. Ongoing prospective audit is needed to better determine risk of IFD in these patients.

References

- Donnelly, J.P., et al., *Revision and Update of the Consensus Definitions of Invasive Fungal Disease From the European Organization for Research and Treatment of Cancer and the Mycoses Study Group Education and Research Consortium*. Clin Infect Dis, 2020. 71(6): p. 1367-1376.
- Groll, A.H., et al., *8th European Conference on Infections in Leukaemia: 2020 guidelines for the diagnosis, prevention, and treatment of invasive fungal diseases in paediatric patients with cancer or post-haematopoietic cell transplantation*. Lancet Oncol, 2021. 22(6): p. e254-e269.