Haematological malignancies and bacteraemia: Risk and prognosis

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ABSTRACT

The aim of this PhD dissertation was to examine the association between bacteraemia and haematological malignancies. The dissertation includes four observational studies conducted in North Jutland County, Denmark, and is based on data from the Danish Cancer Registry, the North Jutland Hospital Discharge and Bacteraemia databases, and the Danish Civil Registration System.

In study I, we estimated the data quality of a haematological malignancy discharge diagnosis in the Hospital Discharge Registry, using the Danish Cancer Registry as reference standard. The survival analyses were computed based both on data from the County Hospital Discharge Registry and the Danish Cancer Registry, respectively. We found completeness in the Hospital Discharge Registry for all haematological malignancies to be 91.5% (95% confidence interval [CI]: 89.6–93.1) and positive predictive value to be 84.5% (95% CI: 82.2–86.5). This misclassification had, however, no major impact on survival estimates.

In study II, we found that despite having similar distributions of the microbial agents causing bacteraemia, patients with haematological malignancies had higher mortality than patients without any malignancy (Mortality rate ratio [MRR] 1.6 (95% confidence interval [CI]: 1.3-2.0)). However, the mortality was similarly increased in patients with other types of cancer which suggests that bacteraemia patients with malignancies have a poor prognosis because of factors related to their underlying illness.

In study III, we found the risk of bacteraemia within the first year after the diagnosis to vary substantially across different types of haematological malignancies. The mortality, however, did not vary according to the underlying type of malignancy. Polymicrobial bacteraemia and fungaemia were associated with an increased mortality (MRR 2.0 (95% CI; 1.1-3.6)), whereas the mortality was similar for patients with Gram-negative and Gram-positive bacteraemia.

In study IV, we found increasing age to be associated with increased mortality from bacteraemia in patients with haematological malignancies. An increased burden of comorbidity among the elderly did not explain this association.

Our studies have shown that the Danish population-based registries are suitable data sources for longitudinal studies on the association between bacteraemia and haematological malignancies. Several data types, such as hospital pharmacy data, are now being registered in patient administrative databases and we expect in a few years to have collaboration between the new larger Danish regions. Thus, in a few years we will be able to conduct our studies in a nation-wide database with more detailed exposure and confounder data.