

Bacteraemia in haemodialysis patients

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Introduction

Infection remains one of the leading causes of death in patients receiving haemodialysis. An impaired immune system, comorbid disease and the need for regular vascular access all contribute to the increased risk of infection. Bacteraemia in haemodialysis patients are common but establishing the clinical significance, underlying cause and contributory role of dialysis access type from the wide range of implicated pathogens is uncertain. Here we describe the experience of a large tertiary renal centre.

Methods

Data was collected using a Crystal Reports system which links the local renal database to the laboratory clinical portal. Each episode of bacteraemia in an adult patient receiving either acute or chronic haemodialysis was counted during the three-year period from 01/01/2016 – 31/12/2018. Repeated growth of the same organism within 4 weeks was considered the same episode, while each different organism was considered a new episode. The dialysis access type (fistula, graft or line) was obtained from the renal database. Where available the cause of the bacteraemia was extracted from the discharge letter system, other microbiology results on the clinical portal and renal database clinical entries. Patient survival was censored at 31/12/2019.

Results

233 patients with median age 64 years (IQR 53-74) had 363 positive bacteraemia episodes during the 3 year period (347, 14 and 2 patient episodes cultured 1, 2 and 3 distinct bacteria species respectively). There were 24.3 bacteraemia cultures per 100 patient dialysis years. 84 patients had more than one episode of bacteraemia in the 3 year period; one patient had seven episodes.

Table 1. Class of bacteria, clinical source of bacteraemia and dialysis access type

MSSA – methicillin sensitive staphylococcus aureus, MRSA – methicillin resistant staphylococcus aureus, G +ive cocci - exclude Staphylococcus sp.

In the commonest pathogen groups, early mortality was high, irrespective of bacteria type (figure 1).

Figure 1. Survival from the time of first bacteraemia during this period (no adjustment for subsequent transplantation)

Discussion

A broad spectrum of organisms cause bacteraemia in dialysis patients and all groups of bacteria appear to be associated with morbidity and mortality. Dialysis lines continue to be a major source of bacteraemia and continued efforts are needed to prevent line related infection. Most episodes of bacteraemia however are not line related reflecting the comorbid nature of our dialysis patients who have many other risk factors for the development of infection. Adjustment is not made for such case-mix differences between centres in published mortality data and therefore caution is needed in their interpretation.

The IT linkage system used here allows real time reporting of bacteraemia rates as well as to monitor and compare other outcome measures in renal patients and contribute to improvements in patient care. The system contains data on confounding variables such as comorbidity and renal replacement therapy history and vintage which will allow a more robust survival analysis to be undertaken in the future.