

Gram-negative bacteraemias in haemodialysis patients - pathogens and source identification. A 12 year single-centre experience

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Introduction

Patients on haemodialysis (HD) are at a higher risk of infection. Gram-negative bacteraemias in HD patients are associated with significant morbidity and mortality (1). Efforts to reduce the rates of bacteraemias caused by Methicillin Resistant Staphylococcus Aureus (MRSA) have been hugely successful, falling by 57% since 2010 according to Public Health England (2). Epidemiological studies now show the re-emergence of gram-negative pathogens, particularly Escherichia Coli (E.Coli) in causing bloodstream infections (2,3). We aimed to determine the source and pathogens responsible for gram-negative bacteraemias in our HD cohort.

Methods

Data were collected from clinical records, renal unit electronic records, and the hospital's microbiology database of all confirmed bacteraemias in HD patients between 2007 and 2018.

Results

283 episodes of gram-negative bacteraemia occurred in 1361 patients over the 12-year period. 166 (58.7%) were male. The median age was 71 years (range 26-95). 90 (31.8%) had arteriovenous fistulae (AVF) or grafts, the remainder had dialysis lines in place, of which 41 (21.2%) had dual access, with the AVF or graft not yet in use.

The organisms isolated are shown in table 1. E.Coli and Klebsiella Pneumoniae were the dominant pathogens in the study population, accounting for 40.6% (n=115) and 15.9% (n=45) of bacteraemias isolated respectively.

The most common sources of infection were HD access related in 31.4% (n=89), urinary tract 18.4% (n=52), hepato-biliary 7.8% (n=22), chest 7.8% (n=22), gastro-intestinal 6.0% (n=17), skin/soft tissue in 4.9% (n=14) and other in 4.6% (n=13). The source was unknown in 50 (17.7%) and there was no information on 4 patients (1.5%).

Our data revealed that trends in E.Coli incidence were non-linear (see Figure 1). Incidence rates of E.Coli showed a steady increase from 2007-2009 (1.34%-1.59%). There was a significant drop in incidence in 2010 (0.58%), followed by an increase until 2012. Thereafter, rates dropped and have since plateaued.

Discussion/Conclusion

E.Coli bacteraemias remain a dominant cause of gram-negative bacteraemias in our HD population, accounting for the highest incidence rates every year. Dialysis lines are a significant risk factor for bacteraemia, lending further weight to the importance of establishing early definitive vascular access in

these patients. The urinary tract, hepato-biliary system, chest and gastro-intestinal tract were other identified sources of infection.

Most E.Coli bacteraemias are acquired in the community (2). Dialysis populations are exposed to both community and healthcare-associated infections. Recent resistance trends of gram-negative organisms are of particular and increasing concern (4) and therefore, robust surveillance systems that monitor pathogens and their anti-microbial sensitivity patterns are crucial. Our focus now is analysis of the changing sensitivity patterns of isolates and whether our local empiric antibiotic policy is contributing to selection pressures and anti-microbial resistance.