The Clinical Response of Patients with Bloodstream Infections Caused by Bacterial Pathogens Resistant to Antibiotics Used for Empiric Treatment at The University Teaching Hospital, Lusaka, Zambia

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Abstract

Background: Bloodstream Infections (BSI) are infectious diseases characterized by the presence of viable bacterial or fungal microorganisms in the bloodstream and an inflammatory response leading to alterations of clinical, laboratory and hemodynamic parameters. The disease burden caused by BSI is comparable to diseases such as major stroke, acute myocardial infarction, and trauma.

Objective: This study aims to determine antimicrobial susceptibility patterns and elucidate the clinical response to empiric antibiotic therapy and outcome in drug resistant and sensitive BSI pathogens in patients admitted at the University Teaching Hospital. In this study empiric therapy is defined as the initial antimicrobial therapy given to a patient with suspected BSI prior to confirmation of its microbiological aetiology.

Methods: This was an observational prospective cohort study in which 160 suspected BSI patients were enrolled from the university teaching hospital. Blood cultures, day one and three full blood counts were collected to evaluate aetiology and clinical response. The patients were followed up to day 14 to establish the clinical outcome. STATA version 14 was used to analyse the data. Out of the 160 suspected BSI participants enrolled in the study only 34 had bacteriologically confirmed BSI. The gender composition was 23 (67.65%)) male and 11 (32.35%) females. The median (IQR) age was 39.5 (28.25-49.75) years.

Results: There were 24 bacteriologically confirmed BSI isolates that were resistant to third generation cephalosporins while 10 bacteriologically confirmed BSI isolates were found to be drug susceptible to the empiric therapy. Gram Negative Bacteria (GNB) were the leading cause of BSI followed by staphylococcal species. Mortality in drug resistance BSI was 50% while susceptible BSI was 10% and overall mortality was 38.24%. The aetiology of BSI has changed from being predominantly caused by gram positive microorganisms to gram negative microorganisms. Mortality was higher among those with drug resistant BSI (50%) than among drug susceptible BSI (10%).

Conclusion: It is therefore necessary that robust antimicrobial stewardship programs aimed at rational antimicrobial use and enhanced laboratory support are undertaken to prevent the emergency of antimicrobial resistance.

Key words: Bloodstream infections, Empiric therapy, Drug resistance, Gram negative microorganisms, Gram positive microorganisms