

Original Research Article

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Blood Culture Reports Utilization in Management of Blood Stream Infections in Tertiary Care Hospital, South India

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ABSTRACT

Keywords

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The choice of antimicrobial therapy for bloodstream infection is often empirical and based on the knowledge of local antimicrobial activity profiles of the most common bacteria causing infections. This study was conducted at Government Vellore Medical College Hospital to correlate the antibiotic sensitivity pattern with the empirically chosen antibiotics by the clinicians to treat blood stream infections and the change of antibiotic according to the sensitivity pattern. The aim of this work to assess whether antibiotics were changed after receiving blood culture reports by the clinicians. Out of 122 patients included in the study, antibiotics were changed in 107 patients (88%) after the issue of the sensitivity report. The clinical condition of the patient improved with the administration of antibiotics recommended as per the sensitivity report. Mortality was significantly reduced in strictly following the sensitivity pattern. Action plan to educate about Antibiotic choice of bloodstream infections as per Hospital Antibiotic policy of the Hospital, to implement change of antibiotics following reports as per Hospital policy and periodic surveillance regarding sustenance of the Antibiotic policy norms.

Introduction

The choice of antimicrobial therapy for bloodstream infections is often empirical and based on the knowledge of local antimicrobial activity profiles of the most common bacteria causing such infections.

The lethality of septicemia in terms of mortality rate has declined in recent two decades. However, the increasing cases of septicemia particularly in developing countries is still a major health problem

that creates a biggest challenge for the clinicians in selection of suitable antimicrobial agents, as it is further complicated by the development of resistance in organisms to antimicrobial agents, which is the mainstay of treatment for septicemia.

Increasing antimicrobial resistance among bloodstream infections (BSIs) have been reported in many studies conducted in India, (Mehta *et al.*, 2005; Kaistha *et al.*, 2009) and other countries worldwide. (Sader *et al.*, 2002; Kato-Maeda *et al.*,

2003; Biedenbach *et al.*, 1997-2002; Falagas *et al.*, 2006)

Both Gram-positive and Gram-negative bacteria have been isolated from BSIs and predominance of one type over other varies from place to place and even in the same place over time.

Early diagnosis and rapid administration of antimicrobial therapy to patients with BSIs has been shown to reduce mortality and morbidity. (Leibovici *et al.*, 1992, Diekema *et al.*, 1997) The choice of empirical antimicrobial therapy for septicemia must therefore include knowledge of the extent of resistance in common pathogens associated with BSIs. Since the organisms comprise both the Gram-positive and Gram-negative pathogens, knowledge of their resistance patterns is critical in local geographical area. An early initiation of the appropriate antimicrobial treatment is critical in decreasing the morbidity and the mortality among the patients with BSIs. The potential for antimicrobial resistance is also one of the considerations of the physicians when they select a regimen to treat the patients, especially those with bacteremia and septicemia. Hence, the formulation of a common bacteriological profile and antimicrobial susceptibility patterns will guide the choice of the empiric antimicrobial regimens for these patients. Therefore, this study was conducted to correlate the antibiotic sensitivity pattern with the empirically chosen antibiotics by the clinicians to treat bloodstream infections and the change of antibiotic according to the sensitivity pattern.

The main aim and objectives of this study to assess whether antibiotics are changed after receiving blood culture reports by the clinicians. To ensure appropriate prescription of antibiotics as per antibiotic sensitivity pattern.

Standards

100% of patients with positive blood culture reports will adhere to the pattern of Antibioqram given by the Microbiology laboratory.

Materials and Methods

Data collection

Study was conducted at Govt vellore medical college hospital over a period of three months from june 2020 to august 2020.

The collected samples were kept under incubation at 37°C. The growth in the sample were indicated by automated analysers (BacTec & Bacte Alert).The pattern of antibiotic sensitivity of the pathogens were noted and compared with patient case records to look for the change in the prescription of the antibiotic after the issue of the culture report.

Type of Study

Prospective study.

Sample Size

122 samples.

Source of Evidence

Antibiogram as stated in Bacteriology SOP.

Exceptions (If Any)

Patients who were previously treated with antibiotics outside, before hospitalization at Govt Vellore Medical College Hospitals.

Results and Discussion

Antibiotic Change after the Sensitivity Report

Out of 122 patients included in the study, antibiotics were changed in 107 patients (88%) after the issue of the sensitivity report. BSIs are one of the main causes of death in hospitalized patients, with mortality rates between 30-70% (Arnoni *et al.*, 2007). Blood cultures also provide essential information for the evaluation of a variety of diseases like endocarditis, pneumonia, and pyrexia

of unknown origin and particularly, in patients with suspected sepsis.

The microorganisms which are present in the circulating blood, whether continuously or intermittently, are a threat to the host (Cleven *et al.*, 2006).

A variety of organisms are isolated in BSIs. Organisms like Staphylococci, Enterococci and Enterobacteriaceae are often implicated.

Presently, there is an increase in the incidence of the bacteremia which is caused by the members of Enterobacteriaceae and other gram negative bacilli like *Pseudomonas* spp and *Acinetobacter* spp (Kang *et al.*, 2011).

The bacteremia which is caused by the Enterobacteriaceae family is associated with an increased mortality as compared to the BSIs caused by Gram-positive bacteria (Kang *et al.*, 2011). Furthermore the presence of multidrug resistance to these strains leads to a longer hospital stay, more expensive/ toxic drugs and a higher mortality. In our study out of the total 122 cases, antibiotics were

changed in 88% of cases (107 out of 122 cases) after the sensitivity report. The clinical condition of the patient improved with the administration of the antibiotics recommended as per the sensitivity report.

There is 88% adherence by the clinicians in changing the antibiotics as per the antibiotic sensitivity pattern. In this audit out of the total 122 patients there was clinical improvement in 107 patients in whom the antibiotics were changed according to the antibiotic sensitivity pattern. Mortality was significantly reduced in strictly following the sensitivity pattern.

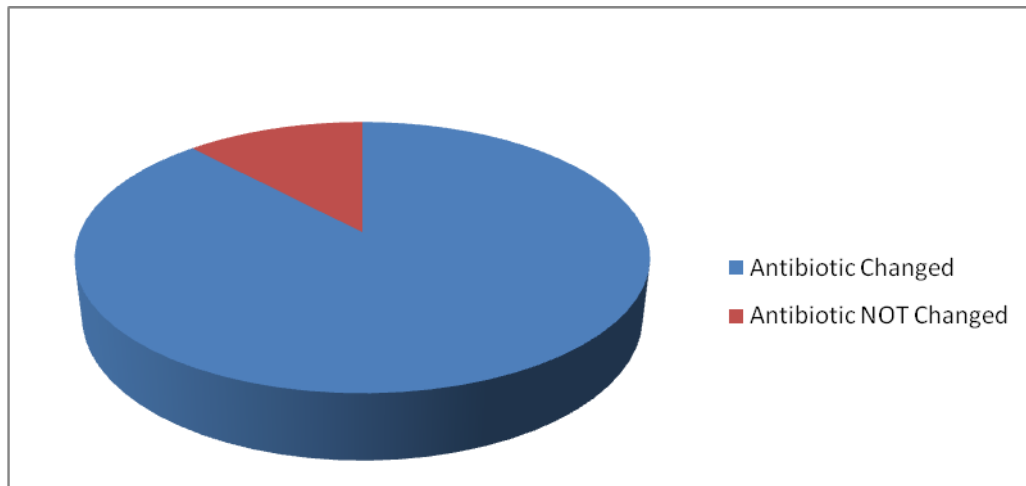
Action plan

To educate about Antibiotic of choice for Blood stream Infections as per Hospital antibiotic policy of the hospital.

To implement change of Antibiotic following report as per hospital policy.

Periodic auditing regarding sustenance of the Antibiotic policy norms.

Fig.1



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