

# A Prospective Study on Incidence of Septicaemia in patients in IPD of Medicine Department

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## ABSTRACT

**Background:** Bloodstream infections are important causes of mortality and morbidity. Rapid empiric antibiotic therapy is often needed. Knowledge of epidemiological data of common pathogens and their antibiotic sensitivity pattern is needed for rapid therapy.

**Methods:** This study was done to analyze the common causes of septicaemia and their antibiotic sensitivity pattern from the Department of General Medicine, Kanachur Institute of Medical Sciences, Natekal, Mangaluru. Isolates were identified using bacteriological and biochemical methods and antibiotic sensitivity was done using the Kirby-Bauer disc diffusion method.

**Results:** This study showed that of the 75 patients examined 22 had septicaemia. 31-45 years age group patients constituted the greatest percentage of infected subjects (n=28) followed by patients aged between 46-60 years (n=17). Gram-positive bacteria were encountered more often than gram negative bacteria. Among the gram-positive bacteria, majority isolated were *S. epidermidis*; followed by *S. aureus*.

**Conclusion:** Majority of the organism isolated were from Gram positive category, in which *S. epidermidis* was the most isolated.

**Key words:** Septicaemia, Infection, Emergency coli.

DOI:10.21276/iabcr.2018.4.2.54

Received: 15.01.18

Accepted: 07.02.18

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## INTRODUCTION

Septicaemias are important causes of mortality and morbidity and are among the most common healthcare associated infections.<sup>1</sup> Illnesses associated with bloodstream infections range from self-limiting infections to life threatening sepsis that require rapid and aggressive antimicrobial treatment.<sup>[2]</sup> A wide spectrum of organisms has been described and this spectrum is subject to geographical alteration. Patients who are granulocytopenic or inappropriately treated may have a mortality rate that approaches 100%.<sup>[1]</sup>

Moreover, fatalities among patients infected with Gram-negative bacilli are higher than those among patients who have Gram-positive cocci as causative agents of their

bacteraemia.<sup>[3]</sup> Worldwide; emergence of antibiotic resistance in all kinds of pathogenic bacteria is a serious public health issue. It is associated with greater hospital mortality and longer duration of hospital stay, thereby increasing health care costs.<sup>[4]</sup> Also, colonization and infection with antibiotic-resistant bacteria has made the therapeutic options for infection treatment extremely difficult or virtually impossible in some instances.<sup>[5]</sup> There are many reasons for this alarming phenomenon, including increasing antibiotic use and misuse in humans, animals and agriculture, clustering and overcrowding and poor infection control.<sup>[6]</sup>

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Website: <a href="http://www.iabcr.org">www.iabcr.org</a>	Quick Response code 
DOI: 10.21276/iabcr.2018.4.2.54	

**How to cite this article:** Reddy KS. A Prospective Study on Incidence of Septicaemia in patients in IPD of Medicine Department. Int Arch BioMed Clin Res. 2018;4(2):190-192.

**Source of Support:** Nil, **Conflict of Interest:** None

Due to the high mortality and mobility associated with septicaemia, antimicrobial therapy in most cases is initiated empirically before the results of blood culture and antimicrobial susceptibility pattern of the isolates are available.<sup>[1]</sup>

Knowledge of local antimicrobial resistance patterns from accurate bacteriological records of blood culture results is needed to provide guidance towards an empirical therapy before sensitivity patterns are available. Bacteraemia is usually caused by a wide spectrum of bacteria with varying antimicrobial susceptibility pattern. However, there is a paucity of information about the relative contribution of different bacteria to infections in Sub-Saharan Africa and how this varies across the full range age groups.<sup>[7]</sup> Bacteraemia often require prompt diagnosis and effective treatment to prevent death and complications from septicaemia. Physical signs and symptoms are usually useful in identifying patients with septicaemia and other non-localized infections but these have limited specificity.<sup>[8]</sup> Bacteriological culture to isolate the offending pathogen and determine its antimicrobial sensitivity pattern has remained the mainstay of definitive diagnosis of septicaemia.<sup>[9]</sup> In most cases of suspected septicaemia antimicrobial therapy is always initiated empirically because bacteriological culture results take about a week to be available.

Epidemiological data on common blood stream pathogens and their antimicrobial sensitivity pattern is thus very important to make the right choice of empiric therapy.

## METHODS

This study was conducted in the Department of General Medicine, Kanachur Institute of Medical Sciences, Natekal, Mangaluru. All the subjects were patients suspected clinically for septicaemia and sent to the bacteriology laboratory for blood culture by physicians. Written informed consent was taken before the study. The blood culture bottles were immediately incubated aerobically at 35°C for 24 hrs.

After 24hrs, bottles were checked for positive cultures (growth on the agar slope and/or turbidity in the broth). Negative cultures were re-incubated and checked daily for up to three weeks unless growth occurred. Before re-incubation, the slope was re-inoculated by tipping the bottle. Antibiotic susceptibility testing was done on MH using the Kirby-Bauer disc diffusion technique.<sup>[11]</sup> Antibigram for *Streptococcus* species was done on blood agar.

## RESULTS

Of the 75 patients examined for septicaemia, positive culture was found in 22 (29.33%). Age distribution of the patients is shown in Table 1.

Majority of the infected patients were found in the 31-45 years of age group (n=28) followed by 46-60 age group (n=17) and least in >76 age group. Maximum no. of positive culture was found in 31-45 age group followed by 46-60 years age group.

The type and pattern of bacteria isolates in the various age groups is shown in Table 2. Gram-positive bacteria were encountered more often than gram negative. Among the gram-positive bacteria, *Staphylococci* constituted most followed by *Streptococci* species. Among gram-negative bacteria, enterobacteriaceae and non-fermenting bacteria were more frequent.

**Table 1. Age Distribution of Patients with Septicaemia**

Age ranges (years)	No clinically examined	No (%) of positive culture
15-30	14	3
31-45	28	10
46-60	17	6
61-75	12	2
>76	4	1
Total	75	22

**Table 2:- The Type and Distribution Of Bacteria Isolates**

Bacteria Isolates	Total
<i>S.aureus</i>	5
<i>S. epidermidis</i>	6
<i>S. saprophyticus</i>	1
<i>Streptococcus</i> sp.	1
<i>S. typhi</i>	1
<i>Salmonella</i> species	2
<i>K. pneumonia</i>	1
<i>E. coli</i>	1
<i>Enterobacter</i> sp.	1
<i>Pseudomonas</i> sp.	1
<i>Acinetobacter</i> sp.	1
<i>Proteus mirabilis</i>	1
Non enterobacteriaceae	1
Gram positive bacilli	1

## DISCUSSION

This study is a record of septicaemia in patients attending the Medicine department of Department of Medicine, Kanachur Institute of Medical Sciences. Results showed that septicaemia was present in 29.33% of patients examined. Gram positive bacteria were encountered more than gram-negative bacteria, and the most frequent invasive bacteria were *Staphylococcus epidermidis*, *S. aureus*, *Salmonella typhi* and *Klebsiella* species.<sup>[6]</sup>

These results are similar to those obtained in some previous studies<sup>9</sup>: Bacteremia was identified in 552 (45.9%) of 1201 children in Nigeria; 53.4% of the infections were due to gram positive bacteria and 46.6% due to gram negative bacteria. The most frequent isolate was *S. aureus* (47.7%) followed by coliforms (23.4%), unidentified gram-negative rods (8.0%), *Pseudomonas aeruginosa* (5.8%), *Streptococcal* species (4.7%) and *Chromobacteria* species (4.5%). Hill et al.<sup>7</sup> also reported an incidence of 34% (297) out of 871 patients studied. The isolates were dominated by gram-positive bacteria.

Results have also shown a very high incidence of septicaemia among 31-45 age group. It is also in accordance with results from Laos in which 69.2% of *Staphylococci* were form majority bulk.<sup>[12]</sup> The rate of isolation also reduced with increasing age as seen in this study.

However, while this study represents real life clinical practice in the hospital in which it was conducted, our approach had some limitations.

The primary reason for requesting the blood culture from patients is still not clear.

## CONCLUSION

This study shows that *Staphylococcus epidermidis*, *S. aureus* and *Salmonella typhi* are the living cause of bacteraemia among patients in the locality.

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