

# Bacteremia in a General Hospital in Kerman: An Analysis of 376 Isolated Bacteria and their Antibiogram

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## • Abstract

To identify the microorganisms causing bacteremia in a 250-bed hospital in Kerman, central Iran, a 2-year analysis of blood culture samples was performed. A total of 4,617 samples were analyzed and 376 positive cultures (8.14%) were identified, 119 of which (31.65%) were adults, 167 (44.41%) children, and 90 (23.94%) neonates. *Staphylococcus* was the most common cause of bacteremia followed by *Escherichia coli* and *Pseudomonas*. The antibiotic sensitivity tests revealed high resistance to some broad-spectrum and widely-used antibiotics such as amoxicillin (86%), penicillin (85%) and oxacillin (84%). Maximum sensitivity was found to be toward ciprofloxacin (88%), amikacin (61%), tobramycin (50%) and gentamicin (49%). Better knowledge of common sources of bacteremia and their antibiotic sensitivity could pave the way to a better management of nosocomial infections.

**Keywords** • Bacteremia • blood culture • antibiotic sensitivity • nosocomial infection

## Introduction

The problem of bacterial antibiotic resistance emerged as the first antibiotic became available for clinical use. Resistant bacteria could be the mutant form of common bacteria due to overuse or unprescribed use of broad-spectrum antibiotics. The pattern of this resistance differs from region to region and even from hospital to hospital. Therefore, the identification of common organisms involved in nosocomial infections (especially bacteremia) and to investigate their sensitivity and resistance to the commonly used antibiotics, could be a matter of concern.<sup>1,2</sup>

The present study is designed to identify the organisms causing bacteremia and their sensitivity to antimicrobials in a general hospital in Kerman, central, southeast Iran.

## Material and Methods

The blood culture samples referred to the Clinical Laboratory of Hospital Ndl in the city of Kerman were reviewed for a 2-year period from February 1997 to February 1999. These samples were obtained from several different units including the neonatal and pediatric wards. The uniform blood culture media were manufactured by Padtan-Teb Co. (Tehran, Iran) in 50 ml bottles. After injecting and mixing the blood into the medium, the bottles were incubated at 37°C for 24 hours. The medium was then transferred in blood-agar, EMB-agar, and chocolate-agar petri-dishes and incubated for another 24 hours. This protocol was repeated for two days, and the two sets of plates were checked after 24 and 48 hours.

The routine subculture set of media and disk- diffusion test methods were used to differentiate the bacteria and to determine their antibiotic sensitivity, respectively. The diameter of the inhibition

zone was considered for determining the sensitive, intermediate and resistant organisms.

## Results

From the 4,617 samples analyzed in this study, 376 positive cultures were attained. In the neonatal unit, 90 (16.92%) positive specimens were obtained and the relative frequencies of bacteremia in the pediatric and adult units were 13.4% and 4.1%, respectively.

[Table 1](#) shows the most common bacteria isolated from our blood culture samples. The prevalence of different bacteria differs in neonates, children, and adults. In the neonatal age group, Staphylococcus coagulase-negative, Staphylo-coccus coagulase-positive and Pseudomonas were the most common organisms isolated. This pattern is repeated in the children age group. In adults, the prevalence of Staphylococcus coagulase-negative and Pseudomonas were lower and *Escherichia coli* and Salmonella species became more prevalent (here the Staphylococcus maintains its first rank).

[Figure 1](#) shows the pattern of antibiotic resistance in the positive blood culture samples. As shown, many wide-spectrum commonly used antibiotics were no longer effective on many strains, while some other less common antibiotics were effective.

## Discussion

Although contamination of the specimens could be one of the reasons for high prevalence of Staphylococcal positive cultures, its consistent high rate even in the adult group could suggest its role in septicemia.<sup>3,4</sup> Patients with associated foreign bodies and indwelling medical devices are at high risk of developing bacteremia due to coagulase negative Staphylococci.<sup>5,6,7</sup>

The relatively high incidence of Gram-negative infections in the neonatal unit could be due to cross infection which may be controlled to some extent by hygienic measures.<sup>8,9</sup>

The results of this study could be of value in the early detection and prescription of proper antimicrobials.

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