Correspondence

Bacteriology of orthopaedic wound infections in an Indian Tertiary Care Hospital

Sir,

The number and range of orthopaedic procedures performed in our hospitals has increased over the recent decades. With these advances, the incidence of severe wound infections caused by multiple drug-resistant bacteria has increased. Epidemiological data regarding the microbial agents causing orthopaedic wound infections in our country, however, are limited.

In our study the microbiological records of orthopaedic wound infections in patients admitted to the All India Institute of Medical Sciences, a 1267-bed tertiary care hospital in New Delhi as well as outpatients being treated in an ambulatory setting i.e., in the Orthopaedic outpatient department (Orthopaedic OPD) were retrospectively analyzed for a period from January 2000 to June 2003. Pus samples were cultured and organisms were identified by conventional methods. Antimicrobial susceptibility testing was performed by standard disc diffusion method as recommended by National Committee of Clinical Laboratory Standards (NCCLS) . All Gram-negative bacilli were tested for extended spectrum beta-lactamase (ESBL) production by a double disc diffusion method as recommended by the NCCLS. Staphylococcus spp. were tested for methicillin resistance by using 1 µg oxacillin disc. A vancomycin screen agar (6 µg /ml) was also put to detect vancomycin intermediate isolates of staphylococci.

During the study period, a total of 2,482 pus samples were received for bacterial culture. Of the 710 samples from hospitalized patients, 242 bacterial isolates were obtained of which 128 (53%) were Gram-positive and 114 (47%) Gram-negative. The most frequent organisms were Staphylococcus aureus (40%), Pseudomonas aeruginosa and Acinetobacter spp (12% each) (Table). Forty per cent of S. aureus showed resistance to oxacillin but retained a consistent susceptibility to vancomycin. Among the Gram-negative bacterial isolates, 75.6 per cent were ESBL producers.

Of the 1772 pus samples obtained from ambulatory patients, a total of 961 bacterial strains were obtained of which 711 (74%) were Gram-positive and 250 (26%) Gram-negative. In this group also, the predominant organisms were S. aureus (62%) and P. aeruginosa (10%) but with varying isolation rates (Table). Thirty per cent of S. aureus isolates showed resistance to oxacillin. Vancomycin was uniformly active. All Group A beta haemolytic Streptococci were susceptible to penicillin, 11 per cent were resistant to erythromycin. Among the Gram-negative bacilli, 48.8 per cent were ESBL producers.

In this study, Gram-positive cocci were associated conspicuously more with wound infections in ambulatory than in hospitalized patients. The prevalence of Gram-positive and Gram-negative bacteria were almost similar in hospitalized patients. We believe that this distribution is real and is most likely a consequence of Gram-negative bacteria gaining a foothold in nosocomial infections in our hospital. S. aureus was by far the most frequent pathogen in both groups, though its frequency was significantly ($P<0.001$) higher in outpatients. We observed a significantly ($P<0.001$) lower prevalence of Acinetobacter sp. among ambulatory patients as compared to hospitalized ones. Acinetobacter has recently emerged as a nosocomial pathogen and an important cause of morbidity and mortality, mainly among debilitated patients. It is interesting to note...
that the enterococcal infections were less frequently encountered in both the group of patients when compared to other studies\textsuperscript{5}.

Oxacillin resistance was frequently high among \textit{S. aureus} isolates in both hospitalized and ambulatory patients. Infection with MRSA has become a major problem in orthopaedic patients\textsuperscript{6,7}. Thus, for empiric therapy in our patients it can be expected that almost 50 per cent of orthopaedic wound infections would be caused by \textit{S. aureus}, mainly oxacillin-resistant. Extended spectrum beta-lactamase producing Gram-negative bacteria have also become important organisms of orthopaedic wound infections in hospitalized patients consistent with other reports\textsuperscript{8}.

In conclusion, the findings indicated that both Gram-positive and Gram-negative bacteria caused wound infections in orthopaedic patients. The results might serve as a foundation for establishing empiric therapeutic approaches for the management of such infections in our hospital.

\begin{table}
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\caption{Bacteria recovered from orthopaedic wound infections in hospitalized and ambulatory patients}
\begin{tabular}{llll}
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Organism & Inpatients & & Outpatients \\
& no. (%) & & no. (%) \\
\hline
\textit{Gram-positive cocci:} & & & \\
\textit{Staphylococcus aureus} & 97 (40) & & 599(62)** \\
\textit{Coagulase-negative:} & & & \\
\textit{Staphylococcus} & 16 (7) & & 57 (6) \\
\textit{Streptococcus pyogenes} & 6 (2) & & 46(5) \\
\textit{Enterococcus sp.} & 9 (4) & & 9 (1)* \\
Sub total & 128 (53) & & 711 (74)** \\
\textit{Gram-negative bacilli:} & & & \\
\textit{Escherichia coli} & 27 (11) & & 39 (4)** \\
\textit{Klebsiella pneumoniae} & 20 (8) & & 26 (3)** \\
\textit{Enterobacter} sp. & 4 (2) & & 14 (1) \\
\textit{Citrobacter} sp. & 3 (1) & & 19(2) \\
\textit{Proteus} sp. & 3 (1) & & 18 (2) \\
\textit{Acinetobacter} sp. & 28 (12) & & 38 (4)** \\
\textit{Pseudomonas aeruginosa} & 29 (12) & & 96 (10) \\
Sub total & 114 (47) & & 250 (26)** \\
Total & 242 (100) & & 961 (100) \\
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\end{table}

\textsuperscript{*}P<0.002, \textsuperscript{**}P<0.001 compared to inpatients (Chi square test)

References


