To the Editor:


Pamukkale University Hospital from
22 Apr 2022 at 00:59:04

REFERENCES

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The authors decline to reply.

Nosocomial Infections in a Turkish University Hospital: A 2-Year Survey

To the Editor:

Nosocomial infections represent an important problem worldwide as a major cause of morbidity, mortality, and economic consequences.\textsuperscript{12} Epidemiologic and etiologic characteristics of nosocomial infections have varied among countries and even among different hospitals in the same country. In this study, we determined the epidemiologic and etiologic characteristics of nosocomial infections in a Turkish university hospital for 2 years.

The study was conducted in Pamukkale University Hospital from January 2000 to December 2001. Criteria for defining nosocomial infections were those published by the Centers for Disease Control and Prevention.\textsuperscript{1} All data, including admission date, services, risk factors, infection sites, isolated microorganisms and their susceptibility patterns, and treatment, were recorded using SPSS software (SPSS, Inc., Chicago, IL).

A total of 666 nosocomial infections were detected in 480 (4.35%) of 11,025 patients hospitalized during 2000 and 2001 (6.04 infections per 100 patients). The relative frequency of nosocomial infection was highest in the Anesthesiology Intensive Care Unit (26%), followed by the Neonatal Intensive Care Unit and the Neurosurgery Unit (Table 1).

The most frequent types of nosocomial infections were urinary tract infections (n = 167 [25.1%]), pneumonia (n = 155 [23.3%]), bacteremia (n = 117 [17.6%]), and surgical-site infections (n = 95 [14.3%]). One hundred thirty-two other infections accounted for an additional 19.8%.

A total of 801 microorganisms were isolated from 480 patients. The most frequently isolated microorganisms were Staphylococcus aureus (18.7% [with 65% of these being methicillin-resistant S. aureus]), Pseudomonas aeruginosa (16%), Coagulase-negative staphylococci (13%), and Acinetobacter baumannii (10.1%) (Table 2). The observed attack rate of 6 infections per 100 patients in this study was consistent with the rates of 3.5% and 11.6% reported from multiple other countries.\textsuperscript{48}

In this study, the highest infection rates involved intensive care unit patients for whom the most common nosocomial infection was pneumonia, followed by urinary tract infections. In other services, urinary tract and surgical-site infections were

\begin{table}[h]
\centering
\caption{Nosocomial Infection Rates by Clinics}
\begin{tabular}{|l|c|c|c|}
\hline
Clinic & No. of Patients & No. of Nosocomial Infections & \% \\
\hline
Anesthesiology Intensive & 434 & 113 & 26 \\
Care Unit & & & \\
Neonatal Intensive & 240 & 46 & 19.2 \\
Care Unit & & & \\
Neurosurgery & 466 & 58 & 12.4 \\
Pediatrics & 671 & 63 & 9.4 \\
Dermatology & 48 & 4 & 8.3 \\
Internal medicine & 940 & 50 & 5.3 \\
General surgery & 793 & 38 & 4.8 \\
Orthopedic surgery & 657 & 31 & 4.7 \\
Cardiovascular surgery & 134 & 4 & 3 \\
Neurology & 137 & 4 & 2.9 \\
Urology & 816 & 19 & 2.3 \\
Plastic surgery & 305 & 7 & 2.3 \\
Chest diseases & 152 & 2 & 1.3 \\
Pediatric surgery & 270 & 3 & 1.1 \\
Obstetrics and gynecology & 2920 & 29 & 1 \\
Otorhinolaryngology & 889 & 6 & 0.7 \\
Others & 1,173 & 3 & 0.3 \\
\hline
\end{tabular}
\end{table}

\begin{table}[h]
\centering
\caption{Distribution of Isolated Microorganisms}
\begin{tabular}{|l|c|}
\hline
Microorganism & No. \\
\hline
Staphylococcus aureus & 150 (98 MR) \\
Pseudomonas aeruginosa & 128 \\
Coagulase-negative staphylococci & 105 (69 MR) \\
Acinetobacter baumannii & 81 \\
Rheoblastella pneumoniae & 77 \\
Enterobacter cloaceae & 73 \\
Escherichia coli & 68 \\
Candida species & 63 \\
Others & 56 \\
Total & 801 \\
\hline
\end{tabular}
\end{table}

MR = methicillin resistant.

Pamukkale University Hospital: A 2-Year Survey

The observed attack rate of 6 infections per 100 patients in this study was consistent with the rates of 3.5% and 11.6% reported from multiple other countries.\textsuperscript{48}
more frequent. The relative frequency distribution of etiologic agents for this Turkish hospital was similar to what has been observed in multiple other countries.

A Korean study reported that the most commonly isolated microorganisms were S. aureus (17.2%), P. aeruginosa (15.8%), and Escherichia coli (12.3%). A prevalence study done in Switzerland found that the leading pathogens were S. aureus (13%), E. coli (12%), and P. aeruginosa (11%). Of note, S. aureus was the most frequent cause of nosocomial infections in our hospital and 65.3% were resistant to methicillin, suggesting the need for improved control measures.

REFERENCES

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Nasal Carriage of Methicillin-Resistant Staphylococcus aureus Among Healthcare Workers of an Iranian Hospital

To the Editor:
Staphylococcus aureus causes important infections in hospitalized patients that can have severe consequences despite antibiotic therapy. Its main ecological niche is the nose, but the prevalence of nasal carriage has varied according to the population studied. Approximately one-third of the general population carries S. aureus, but healthcare workers (HCWs) may be an especially important reservoir, even if transiently colonized. Several studies have reported rates of nasal carriage ranging from 17% to 50% in HCWs. Methicillin-resistant strains of S. aureus (MRSA) were identified immediately after the introduction of methicillin into clinical practice. The first MRSA outbreaks occurred in European hospitals in the early 1960s. Since then MRSA has spread worldwide, causing problems with therapy and higher mortality rates. Colonized patients have been the primary reservoir for spread, although it can also occur from colonized HCWs.

The aim of this study was to determine the frequency of nasal carriage of MRSA among HCWs in Imam Khomeini Hospital of Urmia, West Azarbayjan, Iran.

This is a general, 300-bed, university-affiliated teaching hospital with more than 400 employees, including service and technical staff. For this study, 230 consenting staff members (115 men and 115 women) had cultures using moistened cotton swabs rotated five times in both anterior nares. Samples were carried within 2 hours to the microbiology laboratory and processed as previously described. The agar screen test was used to detect MRSA by inoculating 10^4 colony-forming units onto Mueller–Hinton agar supplemented with 4% NaCl and containing 6 mg of oxacillin per milliliter according to the National Committee for Clinical Laboratory Standards guideline. No change in the method of identifying MRSA occurred during the study. Antibiotyping was performed by using the disk-diffusion method according to the National Committee for Clinical Laboratory Standards guideline.

This study revealed that 92 (40%) of the participants had nasal colonization with S. aureus and 32 (35%) of these were MRSA (ie. 13.9% of all study participants). Of 92 HCWs carrying S. aureus, 53 (57.6%) were male and 39 (42.4%) were female. The mean age was 31.3 years (standard deviation ± 6.3 years). Carriage rates for S. aureus and MRSA differed for various professional groups (Table). Paramedical staff had more carriage of MRSA than did other groups. There was not an association between gender, age, or years of healthcare service and nasal carriage. Resistance rates to other antibiotics were as follows: penicillin, 67.4%; cotrimoxazole, 42.3%; gentamicin, 25%; clindamycin, 18.3%; ciprofloxacin, 14.18%; erythromycin, 8.7%; and vancomycin, 0%.

A previous study in this hospital had shown that 53.6% of clinical S. aureus isolates from patients were MRSA. The biograms of isolates in this study were compared with those from patients in the prior study and rates of resistance to all antibiotics tested were significantly higher.

TABLE

<table>
<thead>
<tr>
<th>Healthcare Worker</th>
<th>No.</th>
<th>No. with Carriage of S. aureus</th>
<th>Frequency of MRSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician</td>
<td>28</td>
<td>12 (42.8%)</td>
<td>1 (3.5%)</td>
</tr>
<tr>
<td>Nurse</td>
<td>54</td>
<td>22 (40.7%)</td>
<td>7 (12.9%)</td>
</tr>
<tr>
<td>Paramedical staff</td>
<td>108</td>
<td>43 (39.8%)</td>
<td>22 (20.3%)</td>
</tr>
<tr>
<td>Staff not involved in patient care</td>
<td>40</td>
<td>15 (37.5%)</td>
<td>5 (12.5%)</td>
</tr>
</tbody>
</table>