Prevalence of Methicillin-resistant Staphylococcus aureus Colonization among Healthcare Workers and Healthy Community Residents

Sir,

Methicillin-resistant Staphylococcus aureus (MRSA) is one of the most widespread nosocomial pathogens of the late 20th century (1). Various hospital-based studies have described the incidence of MRSA causing such infections (1,2). Until a few years back, only nosocomially-acquired isolates showed such resistance, but, recently, even community-acquired strains have shown resistance to methicillin (3,4). Increased reporting of community-acquired MRSA suggests assessment of the carriage rate of MRSA among healthy individuals in the community, who have neither been hospitalized nor have had antibiotic therapy in the recent past. Also, MRSA being a nosocomial pathogen, it is important to assess its carriage rates among healthcare workers. It was with this background that this study was undertaken in the GTB Hospital over a three-month period in East Delhi, India.

In total, 317 nasal swabs were taken from healthy individuals: 200 from parents accompanying children at the Well Baby Clinic and 117 from adult volunteers of both the sexes. Persons with history of hospitalization, undergoing surgery or treatment of any kind, and intake of antibiotics in the past 12 months were excluded from the study. The second part of the study was carried out among healthcare workers in the GTB Hospital. Two hundred fifty-two healthcare workers from orthopaedics, surgery and gynaecology operation theatre were screened for colonization with MRSA.

The nasal swabs were plated on mannitol salt agar (Difco) and 5% sheep blood agar. The plates were incubated for 24 hours at 35 ºC. Colony morphology, suggestive of S. aureus, was identified by standard methods (5). Susceptibility testing of MRSA was done by the agar screening method on Mueller-Hinton agar (Difco) containing 6 mg/L of oxacillin and 4% sodium chloride. Plates were inoculated with a bacterial suspension matched with 0.5 McFarland standard using spot inoculation. The plates were incubated for exactly 24 hours at 35 ºC. Drug-free plates were used as growth control. S. aureus ATCC 38591 was used in each plate as MRSA control (5,6). Growth of even a single colony was taken as an indicator of resistance. Antimicrobial sensitivity was performed for penicillin (10 IU), amikacin (10 µg), erythromycin (15 µg), ciprofloxacin (5 µg), vancomycin (30 µg), clindamycin (2 µg), and gentamicin (10 µg) using the guidelines of National Committee for Clinical Laboratory Standards for disc-diffusion susceptibility. The plates were incubated at 35 ºC (6).

Of the 317 nasal swabs taken from the healthy individuals in the community, 94 (29.6%) yielded growth of S. aureus. Of the 94 isolates, 17 (18.1%) grew on oxacillin agar. Of the 252 healthcare workers screened, S. aureus was detected among 112 persons (44.4%), and MRSA was detected in 28 samples (25%).

The nasal carriage of S. aureus was 29.6% among the healthy individuals, while it was 44.4% among the healthcare workers. The colonization rate may range from 10% to more than 40% in normal adult population (7). Our figure of 29.6% correlates well within this. The nasal colonization rate of 44.4% is on the higher side probably due to nosocomial exposure among the healthcare workers. Data reported in other studies in tertiary care centres show a similar incidence (8). Colonization of MRSA was significant (p<0.05) among the health workers compared to the healthy individuals by chi-square test. Antimicrobial susceptibility studies of MRSA isolates by disc-diffusion methods showed that 100% of the isolates were resistant to penicillin in both the groups. Table 1 shows the antibiotic sensitivity patterns of the MRSA isolates. It is clearly evident from the study that the strains from the healthcare workers
showed higher resistance compared to those from the community.

MRSA strains have been responsible for many nosocomial outbreaks. Colonized employees often act as reservoirs for the spread of this organism within hospital. There have been a number of reports of community-acquired MRSA from other parts of the world (3,4,8). However, it is not always clear whether these strains have come from the community or are hospital strains that have spread to the community. Molecular techniques may help in solving this problem. Our results indicate the existence of MRSA even among the healthy population with no recent exposure to hospital or healthcare workers, although the isolation rate and antimicrobial resistance among the healthcare workers were higher. Larger community-based studies are needed to confirm that transmission occurs more frequently in community settings.

**REFERENCES**


