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LETTER TO EDITOR

Pseudomonas aeruginosa from hospital environment

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Dear Editor,

Hospital acquired infection is an additional affliction to the patient admitted to the hospital for some serious illness and is caused by pathogens which are prevalent in hospital environment. In the hospital, microbes are ubiquitous; and can reach the sick patient through various sources, such as air, water, food, contaminated equipments, linen, catheters, scopes, ventilators, contaminated disinfectants and other preparations used for treatment, visitors, infected patients, etc.

Pseudomonas aeruginosa, because of its ability to grow in moist conditions with simple nutrients and because of its ability to resist the antibacterial agents and disinfectants, is commonly found in various places of hospital environment including sinks, drains, taps, food, water, pharmacy preparations, contaminated hospital equipments, mattresses and cleaning materials (mops, brushes). It colonizes liquid antiseptics such as quaternary ammonium compounds (cetrimide and benzalkonium in particular), eye medications, infusion fluids, soap solutions, etc. *P. aeruginosa* is a very significant contaminant of pharmaceuticals and cosmetics and its presence in such products causes inactivation of medicaments and direct damage to users. Because of its ability to survive in hospital environment and medicaments, it creates threat to patient care. Therefore, continuous and careful monitoring of these objects and sites is necessary to control infections in hospitalized patients. Regular practice of environmental survey and suitable control measures help to reduce hospital acquired infections considerably.

The fact that hospital acquired infections is caused by microbes, which are prevalent in hospital environment is known since long. But unfortunately this fact is mostly overlooked and relatively very little importance has been given to the environmental studies in hospital and only a few reports are available on environmental surveillance program in hospitals.[1-8]

In a study carried out at tertiary care hospital we had processed 50 specimens such as operation table (10), sink (9), cheatle forcep fluid (8), thermometer fluid (8), hand wash bowl solution (8), mops (4) and eye drops (3) from various sites in the wards and operation theatres for isolation, identification and antibiotic susceptibility pattern. The specimens were collected after the cleaning and disinfection procedures to isolate, identify and to find out antimicrobial susceptibility of *P. aeruginosa* from moist places in hospital environment. Out of 50, 26 (52.0%) were found positive. Majority of the positive specimens were from wards (76.9%). The rate of isolation was highest in sink and mops (100% each) followed by cheatle forceps fluid (75.0%), operation table (50.0%), thermometer fluid (12.5%), hand wash bowl solution (12.5%) and was nil in eye drops. The most common bacterium isolated was *P. aeruginosa*. *Klebsiella* spp., *E. coli, S. aureus, Bacillus subtilis* and *Citrobacter* spp. were other isolates. Imipenem (64.3%) was the most effective antibacterial agent followed by meropenem (57.1%) and ciprofloxacin (50.0%). Amikacin and cefoperazone (28.6% each) were least effective antibacterial agents.

Multiple antibiotic resistant *P. aeruginosa* is a matter of great concern for clinician, especially in hospitalized patients. It is not only an important cause of morbidity but also increases the stay of patient in hospital and increases the cost of treatment. It is a significant pathogen causing a variety of nosocomial infections because of its ability to survive in hospital environment and to develop resistance to antibiotics and disinfectants. It is commonly found in almost all wet hospital sites. From these sites, it reaches sick patients admitted in hospital and causes a variety of serious infections in hospitalized patients with impaired defenses.

The prevalence rate of 52.0% and maximum isolation from sink and mops (100%) in the present study is consistent with Nagoba et al.[1] The lower

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prevalence of 12.5% in hand wash bowl solution and thermometer fluid (12.5% each) as compared to 64.2% and 53.8% respectively in earlier study may be due to frequent change of disinfectant solution.

The finding of *P. aeruginosa* as most common bacterium in the present study is in agreement with earlier studies.[1,3-5] However, this finding is in difference to other workers who reported Gram positive bacteria and *S. aureus* in particular as most predominant bacterium in their study.[6-8] The results of present study show that the prevalence of Gram negative bacteria and *P. aeruginosa* in particular is increasing.

The antibiotic susceptibility pattern of environmental isolates of *P. aeruginosa* is mostly overlooked and rarely reported. A few reports available on susceptibility pattern of *P. aeruginosa* suggest significant resistance to a variety of antibacterial agents.[1,2,6,8]

In the present study, more than 50% isolates showed resistance to commonly used antibacterial agents such as amikacin, cefoperazone, ceftazidime, piperacillin, gentamicin and gatifloxacin. These findings correlate with current view that antimicrobial resistance is increasing day by day, especially in pathogens causing nosocomial infections. This resistance is the result of frequent exposure to antimicrobial agents in hospitals. The survival of bacteria in specimens such as cheatle forceps fluid, thermometer fluid, etc. and their resistance to antimicrobial agents, which is an important predisposing factor in nosocomial pathogens, suggest their role in causing nosocomial infections. Presence of *P. aeruginosa* at various environmental sources suggests that more aseptic care to be taken during the handling of hospitalized patients and more importance is to be given for washing hands in order to decrease environmental contamination and transmission of pathogens to patients.

Microbiological surveillance of hospital environment helps in knowing the details of pathogens prevalent in hospital environment and plays a significant role in planning to reduce the rate of nosocomial infections by setting up appropriate control policies, as it has already been proved that the rate of nosocomial infections is reduced by intensive infection surveillance and control program.

Conflicts of Interest and Source of Funding:
None to declare

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