Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr UGC approved journal no. 63854

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805 Index Copernicus value = 76.77

Original Article

Assessment of bacteriological profile of infections in patients admitted to ICU

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ABSTRACT:

Background: Nosocomial infection is infection acquired in hospital due to hospitalisation for various health reasons and is one of the most important worldwide health-care problems. The present study was conducted to assess bacteriological profile of infections in patients admitted to ICU. **Materials & Methods:** 104 patients admitted to ICU forvarious reasons and developing infection within 48hours of admission of both genders were included and blood cultures and the cultures of intravenous catheter tips, urine and indwelling catheter tips, suction catheter tips, endotracheal secretions, sputum etc were recorded. **Results:** Out of 104 patients, males were 60 and females were 44. Specimens were pus culture in 30, urine culture in 20 and blood culture in 54 cases. The difference was significant (P< 0.05). Common pathogens isolated were Escherichia coli in 28%, Acinetobacter speciesin 17%, Pseudomonas aeruginosa in 12%, Klebsiella pneumoniae in 7%, Staphylococcus aureus in 4%, Enterococcus species in 16% and Streptococcus species in 15%. **Conclusion:** Common pathogens isolated were Escherichia coli, Acinetobacter species, Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus, Enterococcus species and Streptococcus species.

Key words: culture, Nosocomial infection, Klebsiella pneumoniae

Received: 21 June, 2018 Accepted: 26 July, 2018

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This article may be cited as: Sharma S. Assessment of bacteriological profile of infections in patients admitted to ICU. J Adv Med Dent Scie Res 2018;6(8):189-192.

INTRODUCTION

Nosocomial infection is infection acquired in hospital due to hospitalisation for various health reasons and is one of the most important worldwide health-care problems. Each nosocomial infection adds 5-10 days to the affected patient's time in the hospital. Nosocomial infections have increased the morbidity and mortality of hospitalised patients and especially the ones admitted in an intensive care setup.[1]

The importance of the intensive care unit (ICU) is inevitable in the control and treatment of the most variable and severe illnesses of the human body.[2] Inspite of the invaluable and well-established role of the ICU in patient care, ICU-acquired infections bring some degree of morbidity and mortality to patients in the ICU as well as causing significant increases in costs. Hospital infection rates in ICUs have been documented to be the highest of all hospital-acquired infections.[3]

The three most common nosocomial infections are ventilator-associated pneumonias, urinary tract infections (UTIs) and bloodstream infections. Data from the National Nosocomial Infections Surveillance System(NNIS) conducted between 1992 and 1997 from medical ICUs in the United States identified UTIs as the most frequent nosocomial infection. The nature of the ICU environment makes this area of the hospital a focus for the emergence and spread of many antimicrobial-resistant pathogens.[4]

Multidrug-resistant pathogens, such as methicillin resistant Staphylococcus aureus (MRSA), carbapenem resistant Acinetobacter baumannii, Enterobacteriaceae that produce extended-spectrum beta-lactamases and/or carbapenemases (ESBL producers), and carbapenem resistant Pseudomonas aeruginosa, are all being isolated with increasing frequency in ICUs.[5]The present study was conducted to assess bacteriological profile of infections in patients admitted to ICU.

MATERIALS & METHODS

The present study comprised of 104 patients admitted to ICU forvarious reasons and developing infection

within 48hours of admission of both genders. All gave their written consent for the participation in the study. Data such as name, age, gender etc. was recorded. Investigations included blood cultures and the cultures of intravenous catheter tips, urine and indwelling catheter tips, suction catheter tips, endotracheal secretions, sputum etc. All the samples were processed as per standard microbiology guidelines. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 104		
Gender	**Males**	**Females**
Number	60	44

Table I shows that out of 104 patients, males were 60 and females were 44.

Table II Type of specimens

Specimens	Number	P value
Pusculture	30	0.17
Urine culture	20	
Blood culture	54	

Table II, graph I shows that specimens were pus culture in 30, urine culture in 20 and blood culture in 54 cases. The difference was significant (P< 0.05).

Graph I Type of specimens

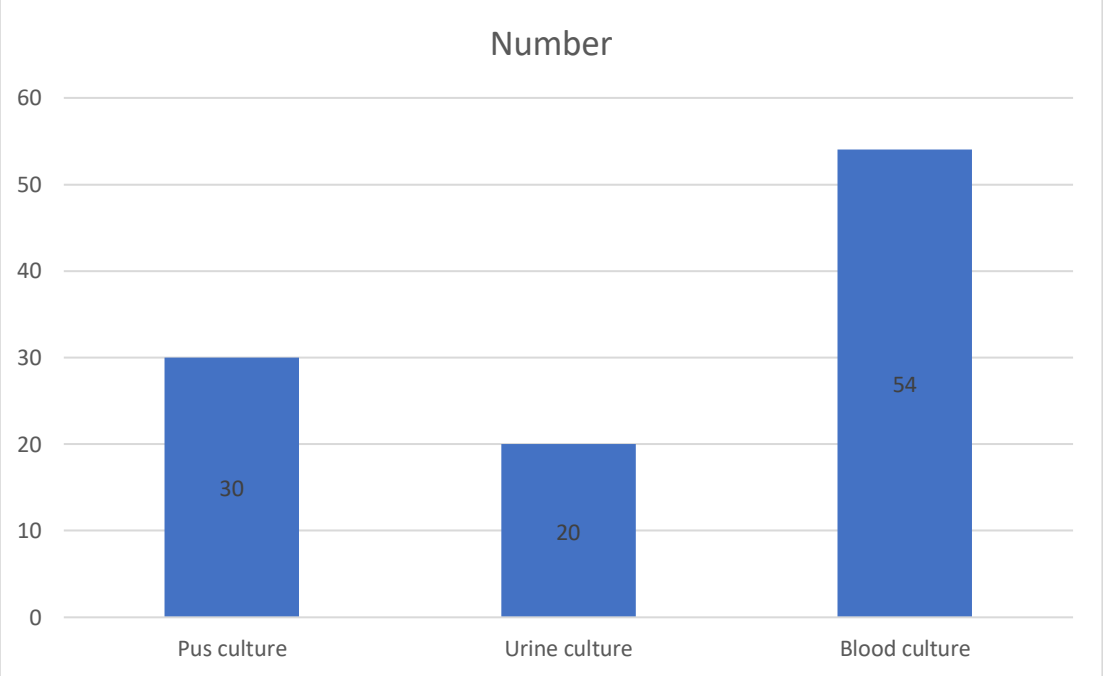

Table III Type of pathogens isolated

Pathogens	Percentage	P value
Escherichia coli	28%	0.09
Acinetobacter species	17%	
Pseudomonas aeruginosa	12%	
Klebsiellapneumoniae	7%	
Staphylococcus aureus	4%	
Enterococcus species	17%	
Streptococcus species	15%	

Table III shows that common pathogens isolated were Escherichia coli in 28%, Acineto bacter species in 17%, Pseudomonas aeruginosa in 12%, Klebsiella pneumoniae in 7%, Staphylococcus aureus in 4%, Enterococcus species in 16% and Streptococcus species in 15%. The difference was non- significant (P> 0.05).

s7116169 DISCUSSION

The ICU has even been described as a factory for creating, disseminating, and amplifying antimicrobial resistance. Incidence of multi-drug resistant bacterial infections is increasing especially in patients in Intensive care units.[6] It is of utmost importance to restrict the administration of antibiotics to effectively control the increase of antibiotic resistance among bacteria. As such, the presence of MDR boosts the deleterious impact of nosocomial infection.[7]The present study was conducted to assess bacteriological profile of infections in patients admitted to ICU.

We found that out of 104 patients, males were 60 and females were 44. Kinila et al[8] found that gram negative bacilli were predominant with 73.35% as compared to gram positive cocci of 9.97% of the total aerobic bacteria grown from various samples of patients admitted in Intensive care unit. Escherichia coli were more common with 26.67% of the total bacteria isolated. This was followed by Acinetobacter species 16.67%, pseudomonas aeruginosa 16.67%, Klebsiella pneumoniae 6.67% and Enterobacter species6.67%. Among the gram- positive cocci, staphylococcus aureus was more commonly isolated with 16.67% followed by enterococcus species 6.67% and streptococcus species 3.30%. Antibiotic resistance was observed by most bacteria to penicillins, third generation cephalosporins, fluoroquinolones like ciprofloxacin, cotrimoxazole. Multi-drug resistance is a major hurdle in treating patients admitted to ICU setting in a hospital. Regular surveillance of antibiotic susceptibility patterns is very important for setting orders to guide the clinician in choosing empirical or directed therapy of infected patients

We found that common pathogens isolated were Escherichia coli in 28%, Acinetobacter speciesin 17%, Pseudomonas aeruginosa in 12%, Klebsiella pneumoniae in 7%, Staphylococcus aureus in 4%, Enterococcus species in 16% and Streptococcus species in 15%.Parvin Hassanzadeh et al[9] studied 123 specimens from 89patients aged 1month to 80years(38.3±13.4), and among them 46patients showed infection based on culture and clinical findings. Of these, 37 patients (41.6%) had more than one ICU-related nosocomial infection and 9 patients (10.1%) had only one ICU-related nosocomial infection. The overall mortality rate for ICU-acquired infections was 10.9% (5patients). Gram-negative bacteria were significantly more involved in infections than were Gram-positive bacteria. The most frequently reported infections were urinary tract infections. The most frequently isolated bacteria were Pseudomonas(39.1%), which was mainly sensitive to a mikac in and ceftazidime.

In a study, the most frequently reported sites for ICU acquired infections were the lungs (64%), abdominal (19%), and blood stream (15%).[10] Data from the United States National Nosocomial infections surveillance system showed that the nosocomial pneumonia accounted for 31% of all nosocomial infections followed by urinary tract infections and blood stream infections.[11] Dasgupta et al[12]determined the incidence of nosocomial infections acquired in the ICU, their risk factors, the causative pathogens and the outcome in a tertiary care teaching hospital.The nosocomial infection rate was 11.98%. Pneumonia was the most frequently detected infection (62.07%), followed by urinary tract infections and central venous catheter associated bloodstream infections. Prior antimicrobial therapy, urinary catheterization and length of ICU stay were found to be statistically significant risk factors associated with nosocomial infection. Nosocomial infection resulted in a statistically significant increase in length of ICU and hospital stay, but not in mortality.

The limitation the study is small sample size.

CONCLUSION

Authors found that common pathogens isolated were Escherichia coli, Acinetobacter species, Pseudomonas aeruginosa, Klebsiella pneumoniae, Staphylococcus aureus, Enterococcus species and Streptococcus species.

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