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Original Research

Species distribution among cases of health-care associated infections in surgical intensive care unit

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ABSTRACT:
Background: The present study evaluated species distribution of health-care associated infections in surgical intensive care unit. **Materials &Methods:** 132 cases of healthcare associated infections (HCAI) from surgical intensive care unit (SICU) were recruited. Bacterial pathogens were isolated and identified in each type of infection. **Results:** Out of 50 patients on central line, 17 developed catheter related blood stream infection (CR- BSI). Out of 64, 31 developed catheter associated urinary tract infection (CA- UTI) and out of 18 patients on central line, 2 developed ventilator associated pneumonia. Out of 17 cases of CR- BSI, pathogens isolated were Klebsiella pneumoniae in 6, E. coli in 1 case, P. aeruginosa in 2 cases, C. albicans in 3 cases, and C. krusei in 5 cases. Out of 31 cases of CA- UTI, pathogens isolated were E. coli in 15 cases, K. pneumoniae in 8, P. aeruginosa in 1, S. aureus, C. albicans and krusei in in 2 cases each and C. tropicalis in 1 case. Out of 2 cases of VAP, pathogens found to be K. pneumonia and E. coli in 1 case each. **Conclusion:** Common pathogen isolated was E. coli and Klebsiella pneumoniae in surgical intensive care unit.
Keywords: E. coli, Klebsiella pneumoniae, surgical intensive care unit

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INTRODUCTION

The process of hospital-associated infections (HAIs) is dynamic and changes over time and in different centres.[1] 4.6% to 9.3% of hospitalized patients have been documented to acquire NIs in numerous European multi- center studies. HAI frequency was 5.9% in another study (country range: 2.9%–10.0%).[2] The tertiary hospital rate was 7%. Candida species are responsible for around 10% of all bloodstream infections (BSI) and 25% of all urinary tract infections (UTIs) in intensive care units (ICUs).[3] Candida species are the third or fourth most frequent cause of health-care-associated infections (HCAI) in the United States, surpassing all other Gram-negative bacilli.[4] Longer hospital stays and greater medical costs are generally associated with nosocomial Candida infections that are resistant to treatment.[5]

There has been a significant change in the epidemiology of IC.5 in recent years. The most common cause of infections worldwide has shifted noticeably from Candida albicans to non-albicans Candida spp.[6] Antifungal resistance is also becoming a more difficult problem for the implementation of effective empirical and preventative treatments, as new species exhibit resistance to various types of antifungal medications.[7]The present study evaluated species distribution of health-care associated infections in surgical intensive care unit.

MATERIALS &METHODS

This study was conducted in the department of Microbiology on 132 cases of healthcare associated infections (HCAI) from surgical intensive care unit (SICU).

The demographical and clinical features of the patients suspected for HCAI were recorded. Bacterial pathogens were isolated and identified in each type of infection. The results were compiled and subjected for statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Patients distribution

Total- 132		
Gender	**Males**	**Females**
Number	72	60

Table I shows that out of 132 patients, 72 were males and 60 were females.

Table II Health-care associated infections

Type of HCAI	Total patients of surgical device	Patients developing infection	P value
CR- BSI	50	17	0.05
CA- UTI	64	31	
VAP	18	2	

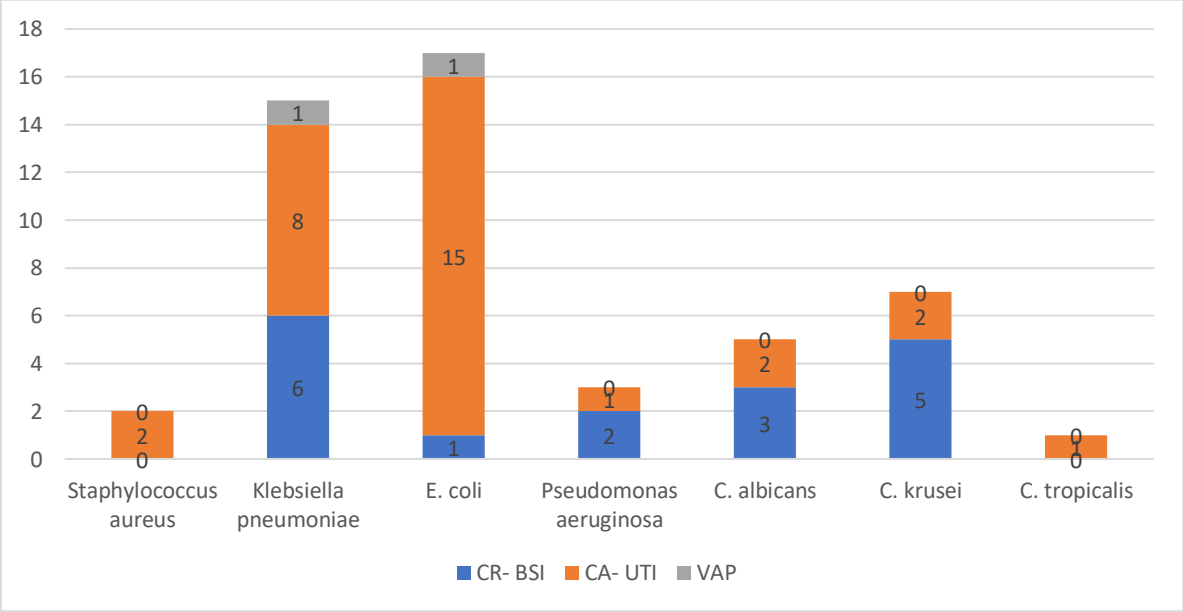
Table II shows that out of 50 patients on central line, 17 developed catheter related blood stream infection (CR-BSI). Out of 64, 31 developed catheter associated urinary tract infection (CA- UTI) and out of 18 patients on central line, 2 developed ventilator associated pneumonia. The difference was significant (P< 0.05).

Table III Pathogens isolated from health-care associated infection

Pathogens	CR- BSI	CA- UTI	VAP	P value
Staphylococcus aureus	0	2	0	0.81
Klebsiella pneumoniae	6	8	1	0.04
E. coli	1	15	1	0.01
Pseudomonas aeruginosa	2	1	0	0.97
C. albicans	3	2	0	0.86
C. krusei	5	2	0	0.05
C. tropicalis	0	1	0	0.97
Total	17	31	2	

Table III, graph I shows that out of17 cases of CR- BSI, pathogens isolated were Klebsiella pneumoniae in 6, E. coli in 1 case, P. aeruginosa in 2 cases, C. albicans in 3 cases, and C. krusei in 5 cases.Out of 31 cases of CA-UTI, pathogens isolated were E. coli in 15 cases, K. pneumoniae in 8, P. aeruginosa in 1, S. aureus, C. albicans and krusei in in 2 cases each and C. tropicalis in 1 case. Out of 2 cases of VAP, pathogens found to be K. pneumonia and E. coli in 1 case each. The difference was significant (P< 0.05).

Graph I Pathogens isolated from health-care associated infection



DISCUSSION

Infections that people contract while undergoing medical treatment are known as health care-associated infections, or HCAIs.[8] Originally known as nosocomial infections, the term "HCAIs" referred to infections associated with acute-care hospital admission.[9,10] However, it is now used to describe infections that occur in a variety of settings where patients receive medical care, such as long-term care facilities, family medicine clinics, home care, and

ambulatory care facilities.[11,12] Healthcare-associated infections (HCAIs) are illnesses that develop within 30 days of receiving medical care or 48 hours or longer after hospitalization.[13,14]The present study evaluated species distribution of health-care associated infections in surgical intensive care unit.

We found that out of 132 patients, 72 were males and 60 were females.Soufir L et al[15]determined the attributable risk of death due to catheter-related septicemia (CRS) in critically ill patients when taking into account severity of illness during the intensive-care unit (ICU) stay but before CRS.CRS complicated 1.17 per 100 ICU admissions during the study period. Twenty (53%) of the CRS cases were associated with septic shock. CRS was associated with a 28% increase in SAPS II. Crude ICU mortality rates from exposed and unexposed patients were 50% and 21%, respectively. CRS remained associated with mortality even when adjusted on other prognostic factors at ICU admission (relative risk [RR], 2.01; 95% confidence interval [CI95], 1.08-3.73; P=.03). However, after adjustment on severity scores calculated between ICU admission and 1 week before CRS, the increased mortality was no longer significant (RR, 1.41; CI95, 0.76-2.61; P=.27).

We found that out of 50 patients on central line, 17 developed catheter related blood stream infection (CR- BSI). Out of 64, 31 developed catheter associated urinary tract infection (CA- UTI) and out of 18 patients on central line, 2 developed ventilator associated pneumonia. In order to improve hand cleanliness and lower the incidence of rotavirus infections linked to hospitals, Zerr et al[16] put in place a hand hygiene program. A multidisciplinary team created a house-wide campaign with hospital support. Throughout the five times, opportunities for hand hygiene were noted. By reviewing laboratory records, the frequency of rotavirus infections linked to hospitals was monitored over time. Multivariate logistic regression was used to examine hand hygiene correlates. From 62% in period 1 to 81% in period 5, there was an overall improvement in hand hygiene compliance ($P < 0.001$). The most popular hand hygiene technique was soap and water, and the usage of alcohol-based hand gel rose from 4% to 29% between the first and last observation periods ($P < 0.001$). The number of rotavirus infections linked to hospitals dropped from 5.9 occurrences.From 5.9 incidents per 1000 patients discharged in 2001 to 2.2 episodes per 1000 patients discharged in 2004 ($P = 0.01$), the rate of hospital-associated rotavirus infection declined. Hand hygiene was independently correlated with hospital ward, type of care provider, kind of care performed, and observation period (adjusted P < or = 0.02 for all).

We found that out of 17 cases of CR- BSI, pathogens isolated were Klebsiella pneumoniae in 6, E. coli in 1 case, P. aeruginosa in 2 cases, C. albicans in 3 cases, and C. krusei in 5 cases. Out of 31 cases of CA- UTI, pathogens isolated were E. coli in 15 cases, K. pneumoniae in 8, P. aeruginosa in 1, S. aureus, C. albicans and krusei in in 2 cases each and C. tropicalis in 1 case. Out of 2 cases of VAP, pathogens found to be K. pneumonia and E. coli in 1 case each. Powe et al[17]conducted a longitudinal cohort study of incident ESRD patients in the case-mix study of the U.S. Renal Data System with seven years of follow-up from hospitalization and death records. Poisson regression was used to examine independent risk factors for hospital-managed septicemia. Cox proportional hazards analysis was used to assess the independent effect of septicemia on all-cause mortality and on death from septicemia. Separate analyses were performed for patients on peritoneal dialysis (PD) and hemodialysis (HD).Over seven years of follow-up, 11.7% of 4005 HD patients and 9.4% of 913 PD patients had at least one episode of septicemia. Older age and diabetes were independent risk factors for septicemia in all patients. Among HD patients, low serum albumin, temporary vascular access, and dialyzer reuse were also associated with increased risk. Among PD patients, white race and having no health insurance at dialysis initiation were also risk factors. Patients with septicemia had twice the risk of death from any cause and a fivefold to ninefold increased risk of death from septicemia.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that common pathogen isolated was E. coli and Klebsiella pneumoniae in surgical intensive care unit.

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