HEALTH CARE ASSOCIATED URINARY TRACT INFECTIONS IN DEPARTMENT OF MEDICINE

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Abstract:

Introduction: Health care associated infections (HCAIs) or hospital acquired infections (HAIs) are infections that occur during hospitalization but they are neither present nor incubating before hospital admission. Health care–associated urinary tract infection (UTI) is an important cause of morbidity and increased health care costs in hospitals. Rapid advances in medical field, injudicious use of antibiotics and better adaptation of organisms to the hospital environment contribute to increase in HAIs. There are additional patient safety concerns associated with urinary catheter insertion, like patient discomfort, activity restriction, discharge delays, and the potential development of a reservoir of multidrug-resistant organisms that can be spread to other patient.

Material and Methods: Patients admitted in wards of medicine department were included in the present study. Patients who were admitted for at least for past 48 hours, or readmitted in less than 14 days after their discharge from hospital. Sociodemographic data from all the included patients was collected from medical records. Clinical history was obtained from all the patients. Signs of HAI were observed and recorded. Bacteremia was defined as presence of bacteria in the blood confirmed by at least one positive blood culture.

Results: A total of 238 patients were included in the study who were admitted in the medicine wards. Out of 238 patients included in the study, 31 (13.02%) presented one or several signs suggestive of HAI and they received microbiological tests. 20 (8.40%) cases were confirmed or potential HAI. Of the 238 patients 109 (54.20%) were male and 129 (45.79%) were female. 31 patients were diagnosed as HAI patients of which 14 (45.16%) were male and 17 (54.83%) were female. Mean age of HAI patients was 54.21 ± 17.41while total mean of age was 46.52 ± 16.74. Mean age of male with HAI 52.41 ± 19.53 and female was 53.46 ± 16.77. Of the total 7 culture positive patients with HAI Escherichia coli was isolated in 3 cases, Klebsiella pneumonia in 2 caesa, Pseudomonas aeruginosa and Staphylococcus aureus were isolated in 1 cases each.

Conclusion: Prevalence of HAI in Urinary tract infection was 13.02% in this study. Preventive measures, periodic active surveillance over a longer period is required to reduce the rate of healthcare associated UTI.

Keywords: UTI, HAI, Health care associated infections, Catheter-associated UTI

Introduction

Health care associated infections (HCAIs) or hospital acquired infections (HAIs) are infections that occur during hospitalization but they are neither present nor incubating before hospital admission. Health care–associated urinary tract infection (UTI) is an important cause of morbidity and increased health care costs in hospitals[i]. More than 100 million indwelling urinary catheters e.g. Foley catheters are used annually in the world[ii]. Most of these catheters are used for short-term catheterization i.e. 30 days or less. Catheter-associated UTI (CAUTI), the most common of all health care-associated infections (HAIs) accounts for approximately 40% of all HAIs[iii]. The Centers for Disease Control and Prevention (CDC) recommends to prevent these infections through appropriate antibiotic use and infection prevention practices[iv].Rapid advances in medical field, injudicious use of antibiotics and better adaptation of organisms to the hospital environment contribute to increase in HAI[v].

It is shown that approximately half of all cases of HCAIs are associated with medical devices and implants[vi].In majority of the cases there is improper insertion of the catheter and CAUTI risk increases considerably with duration of catheterisation[vii]. In HAUTI majority of causative agents are Gram-negative bacteria and emergence of antimicrobial resistance is of great concern with respect to urinary tract infections (UTIs)[viii]. In a European multicentre study posted that the proportion of infected patients

in intensive care units can be as high as 51%; most of these are health care associated[ix].

There are additional patient safety concerns associated with urinary catheter insertion, like patient discomfort, activity restriction, discharge delays, and the potential development of a reservoir of multidrug-resistant organisms that can be spread to other patients. In a study, 42% of catheterized patients reported that their indwelling catheter was uncomfortable, 48% complained that it was painful, and 61% noted that it restricted their activities of daily living[x].

MATERIAL AND METHODS

Present study was carried out in department of Medicine at K.M. Medical College and Hospital, Mathura (UP). Patients admitted in wards of medicine department were included in the present study. Informed written consent was obtained from all the patients.

Inclusion criteria: Patients who were admitted for at least for past 48 hours, or readmitted in less than 14 days after their discharge from hospital.

Exclusion criteria: Patients who completed less than 48 hours of admission and those who received only outpatient care or had exclusively day hospital care were not included.

Healthcare-associated infection (HAI) was defined as infections seen after 48 hours of admission or within 14 days following discharge from the hospital. Confirmed HAI was defined as clinical signs and microbiological confirmation; Potential HAI: association of several clinical signs with no microbiological confirmation; Less potential HAI: a single clinical sign with no microbiological confirmation; No potential HAI: no clinical signs.

Sociodemographic data from all the included patients was collected from medical records. Clinical history was obtained from all the patients. Signs of HAI were observed and recorded. These signs were: hyperthermia Temperature > 38°C; Hypothermia Temperature ≤ 36°C; chills; urinary tract signs or lumbar pain, suprapubic, dysuria, urgency, or burning micturition. HIV status of all the patients, antibiotics administered during admission, site of HAI, existence of invasive device like urinary catheter, venous catheter, sensitivity to antibiotics, and evolution of healthcare associated infection was done.

Bacteremia was defined as presence of bacteria in the blood confirmed by at least one positive blood culture. However, blood culture must be confirmed by clinical signs such as fever (Temperature ≥ 38.5°C) or hypothermia (Temperature ≤ 36.5°C), chills or hypotension.

Statistical analysis was done out through SPSS 21.0 software, Continuous variables were expressed in form of mean values with their standard deviation, or medians with their interquartile ranges. Categorical variables were expressed in percentage. P value of <0.05 was considered as statistically significant.

RESULTS

A total of 238 patients were included in the study who were admitted in the medicine wards. Out of 238 patients included in the study, 31 (13.02%) presented one or several signs suggestive of HAI and they received microbiological tests. 20 (8.40%) cases were confirmed or potential HAI.

Table 1: Patients and HAI

HAI	N	%
One or several signs suggestive of HAI	31	13.02%
confirmed or potential HAI	20	8.40%

Table 2: Sociodemographic data

Variable	Total	Male (%)	Female (%)
Total patients	238	109 (54.20%)	129 (45.79%)
HAI patients	31	14 (45.16%)	17 (54.83%)
Mean Age (Total Patients)	46.52±16.74	46.32± 21.51	45.95 ± 14.25
Mean Age (HAI patients)	54.21± 17.41	52.41 ± 19.53	53.46 ± 16.77

Of the 238 patients 109 (54.20%) were male and 129 (45.79%) were female. 31 patients were diagnosed as HAI patients of which 14 (45.16%) were male and 17 (54.83%) were female. Mean age of HAI patients was 54.21 ± 17.41while total mean of age was 46.52 ± 16.74. Mean age of male with HAI 52.41 ± 19.53and female was 53.46 ± 16.77.

Table 3: Healthcare associated infection and urinary catheter

	Health care associated infection (n=528)		
Urinary Cather	**Yes**	**No**	**Total**
Yes	27 (11.34%)	178 (74.79%)	205 (86.13%)
No	4 (1.68%)	29 (12.18%)	33 (13.87%)
Total	31(13.03%)	207(86.97%)	238(100%)

Of the total 31 HAI cases 27(11.34%) had urinary catheter while 4 (1.68%) doesn't had catheter, over all prevalence of HAI was 31 (13.03%). Of the total 205 (86.13%) patients who had urinary catheter 178 (74.79%) doesn't show HAI. While 27 (11.34%) who doesn't had catheter 29 (12.18%) had no HAI and no catheter.

Of the total 7 culture positive patients with HAI Escherichia coli was isolated in 3 cases, Klebsiella pneumonia in 2 caesa, Pseudomonas aeruginosa and Staphylococcus aureus were isolated in 1 cases each.

DISCUSSION:

Virtually all healthcare-associated urinary tract infections are caused by instrumentation of the urinary tract, creating an opportunity to prevent a large proportion of HAUTIs, including catheter-associated urinary tract infections (CAUTIs).HAI includes catheter-associated urinary tract infections (CAUTI), central-line-associated blood stream infections (CLABSI), and ventilator-associated pneumonias (VAP)[xi].The hospitals in developed countries generate their infection-control surveillance data from time to time as this is important for empirically treating infections, especially in the intensive care unit setting[xii].More than 20% of patients in Intensive Care Unit may be infected with various HCAI with mortality rate of >30%[xiii].

In this study 31 patients were diagnosed as HAI patients of which 14 (45.16%) were male and 17 (54.83%) were female. Mean age of HAI patients was 54.21 ± 17.41while total mean of age was 46.52 ± 16.74. Mean age of male with HAI 52.41 ± 19.53 and female was 53.46 ± 16.77.Surveillance of HAI is an essential element so as to know the current prevalence of the condition and to identify potential risk factors.During hospitalization, various HAI directly related to different invasive procedures such as urinary tract infection, pneumonia, blood stream infection, surgical site infection are often encountered[xiv].

In this study prevalence of HAI urinary tract infection was 31(13.03%).Agrawal R et al.[xv] observed 6.67% HAI prevalence. In a study by Laborde G et al., reported the infection rate to be 36.3% from 314 patients treated longer than 48 hours in neurosurgical ICU[xvi]. Prevalence of HAI in a study by Dia N M. et al in Senegal 10.9%[xvii].

In the present study of the total 7 culture positive patients with HAI Escherichia coli was isolated in 3 cases, Klebsiella pneumonia in 2 caesa, Pseudomonas aeruginosa and Staphylococcus aureus were isolated in 1 cases each. Hospitalized patients are at high risk of colonization with health care-associated pathogens. in a study of 143 Canadian hospitals it was found that among their hospitalized patients, 4.5% were colonized or infected with MRSA, 2.7% were colonized or infected with vancomycin-resistant enterococci (VRE), 1.4% were colonized or infected with *C. difficile*, 1.3% were colonized or infected with an extended-spectrum β-lactamase (ESBL)-producing organism, and 0.1% were colonized or infected with carbapenem-resistant *Enterobacteriaceae* (CRE)[xviii].Mody et al observed that in indwelling devices 15% were colonized with multidrug-resistant *Acinetobacter baumannii*[xix].

CONCLUSION

Prevalence of HAI in Urinary tract infection was 13.02% in this study. Preventive measures, periodic active surveillance over a longer period is required to reduce the rate of healthcare associated UTI

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