Original Article

Prevalence of Urinary Tract Infection in Patient with Indwelling Catheter in Chittagong Medical College Hospital

Raushan Akter[1*]

Mahtab Uddin Hassan[2]

Rajat Sankar Roy Biswas[1]

[1]Department of Medicine
Chattagram Maa Shishu-O-General Hospital
Chittagong, Bangladesh.

[2]Department of Medicine
Marine City Medical College Hospital
Chittagong, Bangladesh.

Abstract

Background: Hospital acquired urinary tract infection among the hospitalized catheterized patient due to different indications are a common morbidity. The objective of study to see the prevalence hospital acquired urinary tract infection among the patients of indwelling catheter admitted in the department Medicine of Chittagong Medical College Hospital. **Methods:** It was a hospital based obsevational study conducted on purposively selected (Non-probability) hospitalized patients who got indwelling catheter had admitted into the Medicine ward, Chittagong Medical College Hospital from 1st January 2013 to 30th June 2013. Total 50 patients were selected. Urine was analyzed for growth of organism and sensitivity was also done in case where growth was positive. Data was analyzed by statistical method with the software SPSS-20. **Results:** Results showed that 15 (30%) developed bacteriuria or urinary tract infection with catheter. Development of bacteriuria was not affected by sex, age. People who introduce the catheter has some influence with the occurrence of UTI. E.coli, Klebsella, Proteas and Pseudomonas aeroginosa were the most common bacteria isolated. Imepenam was found the most sensitive antibiotic. **Conclusion:** Catheter play an important risk for occurrence of UTI. So it should be avoided if possible.

Key words: Urinary tract infection; Indwelling urinary catheters; Bacteriuria; Pseudomonas aeroginosa; E.col.

INTRODUCTION

Nosocomial infections are significant source of morbidity and mortality. It also means extra expenses once it sets in because of prolonged hospital stay and additional hospital needs[1]. Because of theses, activities toward prevention and control of hospital acquired infections have been made since the 1950's.

In the United States, nosocomial infections occur in about 5% of patients admitted in acute care hospitals. In a surveillance study done by the infection control committee of the Philippine General Hospital (PGH) in 1989, the prevalence was 16.3%[2].

Nosocomial urinary tract infection remain a significant contributor to the overall prevalence or incidence of nosocomial infection. Urethral catheter is a major predisposing factor, caused by variety of pathogens, including E.coli, Klebsella, Proteas and Pseudomonas aeroginosa, enterobecter,serratia and candida.Many of theses microorganisms are part of the patient's endogenous bowel flora,but they can also be acquired by cross transmission from other patients or hospital personnel or by exposure to contaminated solutions or non sterile equipment. Situations like immunosuppression, steroid intake, or antibiotic intake would change the usual patterns of pathogens in catheter associated bacteriuria[3,4].

*Correspondence to:

Dr. Raushan Akter
Resident Physician
Department of Medicine
Chattagram Maa-Shishu-O-General Hospital
Chittagong, Bangladesh.
Mobile : +88 01556 541538, 01683 679317
Email : rushanakter@yahoo.com

In between 20 and 30 percent of catheterised patients develop bacteriuria, of whom 2-6 percent develop symptoms of urinary tract infection. The risk of acquiring bacteriuria is approximately 5% for each day of catherisation[5].

Indwelling urinary catheters pose a risk for many infective complications such as perinephric, vesical and urethral abscesses as well as epididymitis,prostatitis and orchitis. The overall incidence of theses complications is unknown, although 20 to 30 percents with asymptomatic catheter induced UTIs may develop local or systematic symptoms[6]. Of patients with a UTI, 1-4 % develops becterimia and, of theses, 13-30% die. Duration of catheterisation is strongly associated with risk of infection i e. the longer the catheter is in place, the higher the incidence of UTI[3,4].

A study was done in Chittagong Medical College Hospital to see the prevalence of HAI according to WHO guideline. The point prevalence of HAI was found 16.9%[7].

The type of HAI found in CMCH in this prevalence survey were UTI=25.8%,surgical site infection 65.6%, pneumonia 9.7% , blood stream infection 15%, gastroenteritis 4.3%[7].

The predominant organism identified were klebsella (32.7%) Coliforms(23.6%) Pseudomonas (29.1%) E.coli (20%) S. aurius (3.6%) Enterococci (1.8%) and proteus(1.8%)[7]. Prevention of nosocomial UTI and its complications would therefore reduce the rate of morbidity and mortality and expenses secondary to the infection .This study is aimed to determine the incidence of bacteriuria, its onset after insertion, and the predisposing factors following insertion of indwelling catheter.

MATERIALS AND METHODS

This observational study was conducted at department of Medicine in Chittagong Medical College Hospital (CMCH) Chittagong. Duration of study was 6 (Six) months. Patients admitted in the Department of medicine and who were given Foley Catheter during that period were included in this study. A total of 50 patients were included. Data was collected by interview, physical and laboratory examinations using a structured questionnaire. Urine sample was collected in a clean dry container and for microscopic examination and culture. RBC, pus cell was determined and urine albumin also detected. Culture was done in Mackconkey's agar and blood agar. Coloney count were calculated if growth was present .Five ml of peripheral blood was collected for examnation of total count and differential count of WBC.Data was processed & analyzed by SPSS-20 version. Different statistical method will be applied for data analysis.

RESULTS

In our study total 50 patients were included. 33(60%) were male & 17(34%) were female. Male to female ratio was 1.9 : 1. Most of the patients age was 51 and above. 78% patients came from rural area & 22% were from urban area. Among the patients, 70% had the indications of neurogical bladder dysfunction. The common underlying illness were stroke & OPC

poisoning. Frequency of UTI was 30% among 50 catheterized patients where male were found more diseased than female (18 % vs 12%). It was observed that prevalence was found among those patients who were catheterized by non trained person (50%). Infectious agent was identified in 30% by urine culture. Pathogens most commonly demonstrated was E. coli 9(60%) followed by Klebsiella 3(20%), Proteus 2 (13.3%) & pseudomonas 1 (6.6%). E.coli was sensitive to Amoxicillin, Ceftriaxone, Imipenem, Meropenem, Vancomycin and resistant to Ciprofloxacin, Amoxyclav and gentamycin. Pseudomonas sp. was sensitive to ciprofloxacin, gentamycin, ceftazidime, meropenem and vancomycin. This organism was resistance to amoxicillin, cephalexin and azithromycin. Klebsiella pneumonae were sensitive to ceftraixone, ciprofloxacin, gentamycin, imipenem & meropenem. This organism was resistance only to amoxicillin. S. pyogen were sensitive to amoxicillin, ceftriaxone, cephalexin, imipenem, meropenem and vancomycin

Table 1 : Aga distribution of the patients (n=50).

Age group (Years)	Number	Percentage
<40	5	10%
41-50	6	12%
51-60	14	28%
61-70	21	42%
>70	4	8%

Table 2 : Gender distribution of the patients (n=50).

Sex	Number	Percentage
Male	33	66%
Female	17	34%

Table 3 : Distribution of patients according to indications of catheterization (n =50).

Indications of catheterization	Number n	Percentage %
Incontinence	4	8.0
Retention	6	12.0
Output monitoring	3	6.0
Neurological bladder dysfunction	35	70.0
Urinary obstruction	2	4.0

Table 4 : Distribution of common underlying illness (n=50).

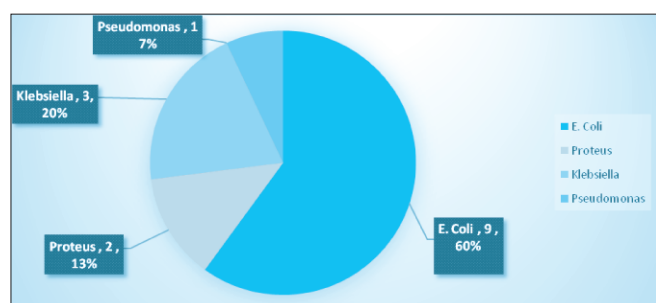| Diagnosis	Number	Percentage
Pneumonia	4	8%
Hypertension	3	6%
Stroke	16	32%
PTB	5	10%
OPC poisoning	11	22%
DM	4	8%
COPD	7	14%

Figure 1: Pie chart showing different types of organism that were identified by culture.

Table 5 : Table showing antibiogram of E coil in UTI.

Drugs	Sensitive	Moderately Sensitive	Resistant
Amoxicillin	0	1	8
Azythromycin	1	1	7
Nitrofurantoin	5	1	3
Netilmycin	5	1	3
Gentamycin	6	0	3
Amikacin	4	0	5
Meropenem	9	0	0
Ciprofloxacin	2	1	6
Cefotaxime	3	1	5
Ceftazidime	4	1	4
Ceftriaxone	3	0	6
Cotrimoxazole	5	1	3
Cefixime	5	3	1

Table 5 showing the pattern of sensitivity of E coil where it was found that E. was sensitive Meropenem and resistant to Amoxycillin, Ciprofluxacine and Gentamycin. Some drugs showed moderate sensitivity against this bacteria.

Table 6 : Table showing antibiogram of Klebsiella in UTI (n=3).

Drugs	Sensitive	Moderately Sensitive	Resistant
Amoxicillin	0	0	3
Azythromycin	1	0	2
Nitrofurantoin	2	0	1
Netilmycin	2	1	0
Gentamycin	1	0	2
Amikacin	2	1	0
Meropenem	3	0	0
Ciprofloxacin	0	1	2
Cefotaxime	1	0	2
Ceftazidime	1	0	2
Ceftriaxone	0	0	3
Cotrimoxazole	0	1	2
Cefixime	1	2	0

Table 6 showing pattern of sensitivity of Klebsiella where the second common bacteria Klebsiella was found sensitive to Meropenem in full and other antibiotics were moderate to full sensitive. Amoxycillin, Ciprofluxacine and Ceftriaxone was found insensitive.

Table 7 : Table showing overall sensitivity pattern of antibiotics in UTI (n=15).

Drugs	Sensitive	Moderately Sensitive	Resistant
Amoxicillin	0	0	15
Azythromycin	3	1	11
Nitrofurantoin	9	1	5
Netilmycin	9	1	5
Gentamycin	4	0	11
Amikacin	7	1	7
Meropenem	15	0	0
Ciprofloxacin	2	1	12
Cefotaxime	3	0	12
Ceftazidime	6	1	8
Ceftriaxone	4	0	11
Cotrimoxazole	7	2	6
Cefixime	5	9	1

Table 7 showing overall sensitivity pattern antibiotics in UTI of catheterized patients where among 13 antibiotics Meropenem was found highly sensitive to all bacteria. On the contrary Amoxicillin was found resistant to all of them. Nitrofurantoin was found highly sensitive to resistant pattern.

DISCUSSION

Present study wass done in the Medicine Department of CMCH among the 50 patients who were given indwelling foley catheter to evaluate the presence of Urinary Tract Infection (UTI) among them.

Regarding the analysis of demographic variables age of the most patients were above 51 and male patients were 33 (66%) and female patient were 17 (34%). As indwelling catheter mostly needed for the elderly, the present age distribution can be explained in that way. Female has less excess to hospital care due to financial and social factors, so number of female patients may less than the male patients.

Underlying disease which in the present study was stroke and OPC poisoning which was 32% and 22% respectively. Disease profile of CMCH 2012 and an ongoing study correlates these findings[7].

Prevalence of UTI in the present study was 30%. Nosocomial UTI occasionally results from direct introduction of urethral microorganisms at the time of catheterization. Microorganisms can migrate to the bladder along the outside of the catheter in the peri-urethral mucosal sheath (Between the catheter and the urethral mucosa), the trans- urethral route, or along the internal lumen of the catheter after the collection bag or catheter drainage tube junction has been contaminated (intraluminal). A study done in CMCH found the prevalence of UTI as a hospital acquired infection was 25.8% which also correlate the present findings[7].

Catheter associated UTI were caused by variety of pathogens, including Escherichia coli which was most common (60%), next to it were Klebsiella, Proteus and Pseudomonas.Many of these microorganisms are part of the patient's endogenous bowel flora, but they can also be acquired by cross- transmission from other patients or hospital personnel or by exposure to contaminated solutions or non sterile equipment[1].

Study done in CMCH regarding pathogen causing hospital acquired infection found that E. coli was 20% and Klebsiella was 32.7%. That study was done on overall hospital acquired infection where as the present study was on the patients with indwelling catheter where catheter played an important extra risk factor for them. Regarding antibiotic sensitivity most of the organism were resistant to common antibiotics. Imipenem was the only antibiotic which was found sensitive to 100% of all organism. This finding was also consistent with the previous study[7].

CONCLUSION

UTI is a common nosocomial infection among the catheterized hospitalized patients. Proper care should be taken during introduction and drainage of the catheter.

DISCLOSURE

All the authors declared no competing interest.

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