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Original Research Article

Postoperative Catheter induced bacteriuria in obstetrics and gynaecological cases

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ABSTRACT

Background: Urinary tract infection is one of most common nosocomial infection and prolonged bladder catheterization is frequent cause. These infections increase hospital stay of patients, morbidity and financial burden. This study was performed to determine rate of catheter induce bacteriuria, most common organisms isolated, rate of bacteriuria associated with duration of catheterization and type of surgery (Elective or Emergency).
Methods: This is prospective observational study done over a period of one year from 2015 January to 2016 January and 599 patients enrolled. The variables studied are rate of catheter induce bacteriuria, most common organisms isolated, rate of bacteriuria associated with duration of catheterization and type of surgery (Elective or Emergency).
Results: Rate of catheter induce bacteriuria was 34.5%, most common organisms isolated were *E. coli, Enteroccocus, MR CONS, Candida albicans, Klebsiella, streptococci.* Bacteriuria was 10.5% when duration of catheterization was less than 12 hrs and 73.9% when duration of catheterization was more than 36 hrs. Also, bacteriuria was more in emergency cases.
Conclusions: It is better to avoid catheterization, duration of catheterization should be reduced so that it reduces catheter induced bacteriuria and associated morbidity, prolonged hospital stay and financial burden.

Keywords: Bacteriuria, Postoperative urine culture, Nosocomial, *Methicillin resistant coagulase negative staphylococcus*

INTRODUCTION

Bladder drainage by transurethral Foleys catheter is common practice used during and after gynaecological and obstetrical surgery to monitor urine output and prevent post-operative urinary retention. However, its implementation was relatively custom-based, hospital policy based and personal preference-dependent, therefore the duration varies markedly.[1-3] Routine catheterization up to three days was common after gynaecological surgery. Prolonged catheterization after 24 hrs has minimal benefits in uncomplicated surgery.[4] It is associated with increased bacterial counts and higher rates of positive urine cultures which concludes UTI is more common in long term catheterization. Duration of catheterization is the most important determinant of bacteriuria.[5] The daily risk of acquisition of bacteriuria when an indwelling catheter *in-situ* is 3-7%. The rate of acquisition is higher for women and older persons.[5] Catheter acquired urinary tract infection is one of the most common health care acquired infections.[6] From 60-80% of hospitalized patients with an indwelling catheter receive antimicrobials, usually for indications other than urinary tract infection.[7] This intense antimicrobial exposure means antimicrobial resistant organisms are frequently isolated from the urine of catheterized individuals. Urinary catheter acquired infection is usually manifested as asymptomatic bacteriuria (CA-ASB). UTI

was defined as when one or more organisms are present in quantitative count >100000 cfu/ml associated with one or more of dysuria, pain, fever, rigor or sepsis. Asymptomatic bacteriuria was defined as when one or more organisms are present in quantitative count >100000 cfu/ml in the absence of symptom.

The most common infecting organism is *Escherichia coli*. And other organisms are *Enteroccocus, MR CONS (methicillin resistant coagulase negative staphylococcus), Candida albicans, Klebsiella species, Streptoccus species and Proteus mirabilis*.

METHODS

This is a prospective observational study included 559 patients undergoing obstetrics and gynaecological surgery, conducted between 2015 January to 2016 January, in Department of Obstetrics and Gynaecology, Rajarajeswari Medical College and Hospital, Bangalore. Ethical committee approval was taken before the start of the study. Informed consent was taken from all patients who enrolled in study.

Routine blood investigations were done. Preoperative urine culture sent before inserting the Foleys catheter, catheter inserted under aseptic precautions 30 minute before start of surgery. Postoperative urine culture sent from the first void after Foleys catheter removal. All patient received spinal anaesthesia except those underwent laparoscopy who received general anaesthesia. Duration of catheter in situ was different in various surgeries ranging from minimum 8 hours to maximum 52 hours. Prophylactic antibiotics were given 30 minute before skin incision and continued for 7-days post-operative.

Inclusion criteria

All the patients undergoing surgery for obstetrics and gynaecological indications and were catheterised.

Exclusion criteria

- Pre-operative urine culture positive
- Injury to bladder or ureter during operation
- With other associated complication during operation e.g. hematoma, excessive hemorrhage.

History of neurological disorders, urinary incontinence. Variables assessed are duration of catheter in situ, rate of bacteriuria, type of surgery and most common organism isolated.

RESULTS

A total of 559 patients enrolled in the study (Table 1), 333 patients underwent Lower segment caesarean section (LSCS) and 226 patients underwent other gynaecological surgeries. 137 patients underwent emergency surgeries while 422 patients underwent elective surgeries. Mean age was 33.39±12.4 years. Mean duration of catheterization was 24.28±13.90 hrs. 193 (34.5%) patients had postoperative urine culture positive (Table 4).

87 (63.5%) patients out of 137 patients underwent emergency surgeries had post-operative culture positive, while 108 (25.59%) patients out of 422 patients underwent elective surgeries had postoperative culture positive. 199 patients had duration of catheterization 1-12 hrs out of which 21 (10.5%) patients had positive postoperative urine culture, 152 patients had duration of catheterization 13-24 out of which 35 (23.1%) patients had positive postoperative urine culture, 82 patients had duration of catheterization 25-36hrs out of which 45 (54.9%) patients had positive postoperative urine culture and 125 patients had duration of catheterization more than 36 hrs out of which 92 (73.6%) patients had positive postoperative urine culture (Table 3).

Most common organism isolated was *E. coli (Escherichia coli)* and other organisms are *Enteroccocus, MR CONS, Candida albicans, Klebsiella species, Streptoccus species, Proteus mirabilis, Pseudomonas, Citrobacter freundii* and *Citrobacter koseri* (Table 2).

Table 1: Various surgeries performed.

Name of Surgery	No. of patients	%
LSCS	333	59.6
TAH	126	22.6
VH	54	9.7
Myomectomy	13	2.4
Laparoscopic salpingectomy	13	2.3
LAVH	10	1.8
Laparoscopic right ovarian cystectomy	3	0.5
Tuboplasty	3	0.5
Laparotomy and cystectomy	2	0.4
Laparoscopic left ovarian cystectomy	1	0.2
RVF Repair	1	0.2
Total	**559**	**100.0**

Table 2: Various organisms isolated.

Organism isolated	No. of patients	%
E. coli	72	37.3
Enteroccocus	59	30.6
MR CONS	26	13.5
Candida albicans	12	6.2
Klebsiella	12	6.2
Streptoccus	4	2.1
Proteus mirabilis	3	1.6
Pseudomonas	3	1.6
Citrobacter Koseri	1	0.5
polymicrobial growth	1	0.5
Total	**193**	**100.0**

Table 3: Duration of catheterization and postoperative urine culture positive rate.

Duration of catheter *in-situ* in hrs	No. of patients	No. of post - operative positive culture	% of positive culture
1-12	199	21	10.5
13-24	152	35	23.1
25-36	82	45	54.9
More than 36	125	92	73.3

Table 4: Postoperative urine culture positive rate.

Postoperative urine culture	No. of patients	%
Positive	193	34.5
Negative	366	65.5
Total	**559**	**100**

DISCUSSION

Bladder drainage by transurethral Foleys catheter is common practice used after gynaecological and obstetrical surgery to monitor urine output and prevent post-operative urinary retention. Catheter induce UTI is one of the common health problem, approximately 15% of nosocomial bacteremia are due to UTI.[8]

In our study catheter induce bacteriuria rate was 34.5% results were comparable with study done by Stamm WE and Hilton P were bacteriuria rate was 30%.[9,10]

In our study, most common organism isolated was *E. coli* results are comparable with study done by B Shrestha et al which shows *E. coli* was most common organism.[11]

In our study rate of bacteriuria was more when duration of catheterization increases, bacteriuria rate was maximum when duration was more than 36hrs, and results were comparable with study done by B Shrestha et al.[11]

Similar study done by S Niveditha et al found catheter induce bacteriuria was more in patients in duration of catheterization was more.[12]

Study done by Hjalmar et al also found catheter induce bacteriuria was more in long term catheterization.[2]

Study by Glavid et al, found that rate of catheter induce bacteriuria was more in patient with long duration of catheterization.[13]

In our study bacteriuria rate was 10.5% when duration of catheterization was less than 12 hrs, 23.1% when duration of catheterization was 13-24 hrs, 54.9% when duration of catheterization was 25-36hrs and 73.9% when duration was more than 36 hrs and most common organism isolated was E. Coli and results are similar to study done by Shakya YM et al.[14] In our study, we found catheter induce bacteriuria was also more common in emergency surgeries (63.5%) compared with elective surgeries (25.6%).

CONCLUSION

We conclude that catheter induced bacteriuria was more common with emergency cases compared with elective cases. It is better to avoid catheterization wherever possible if not duration of catheterization should be reduced, so that it reduces catheter induced bacteriuria and associated morbidity, prolonged hospital stay and financial burden.

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