ORIGINAL RESEARCH PAPER

Volume-6 | Issue-10 | October-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

TO DETERMINE THE PREVALENCE OF URINARY TRACT INFECTIONS IN POST CAESAREAN CATHETERIZED PATIENTS BASED ON DURATION OF CATHETERIZATION.

Gynaecology

Dr. Riddhima Shetty Final yr Post graduate, Dept. Of Obstetrics & Gynaecology, Yenepoya Medical College, Mangalore. Karnataka.

***Dr. Annie Rajaratnam.** Associate Professor, Dept. Of Obstetrics & Gynaecology, Yenepoya Medical College, Mangalore. Karnataka. *Corresponding Author.

ABSTRACT

Urinary tract infections (UTI's) with urinary catheter use is one of the most common causes of hospital acquired infections (HAI's) contributing to about 20%.. Caesarean cases are pre operatively catheterized on a regular basis. Limited use and early removal of catheter as clinically feasible reduces UTI's. Here we wish to analyze the relation between duration of post operative catheterization and UTI's following caesarean section. The 146 caesarean sections done were divided into those where catheter was removed within 12 hours (Group A) and those within 24 hours (Group B) post operatively.72 hours later urine routine, culture and sensitivity was done. Positive urine cultures in Group A (7.6%) were significantly less than in Group B (16%). *E.coli* was the most common isolate (68.7%) followed by *E.aerogenes* (12.5%), *S.aureus* (12.5%) and *Pseudomonas* species (6.25%). All isolates were multidrug resistant. Thus removal of the catheter within 12 hours postoperatively was associated with lower risk of UTI's.

KEYWORDS

Urinary tract infections, Caesarean, catheterization.

Introduction :

Caesarean section is the most commonly performed surgical operations in obstetric practice and is certainly one of the oldest operations in surgery and its prevalence is rising each year. Surgeries require a certain set of preoperative preparations. One such preoperative preparation practice done routinely is the placement of an urinary catheter prior to caesarean section. The reasons cited are, better bladder exposure during surgery, decreased risk of intraoperative injury to the bladder, urinary output assessment and prevention of urinary retention. But this practice imposes the added cost of urinary catheters, urine bags and antimicrobial therapy for UTI, besides patients' discomfort and delayed ambulation. Furthermore in the current scenario, the need to assess the cost effectiveness of health care delivery services is particularly important in developing countries like India.

The catheter is usually removed immediately after 12-24 hours or more post surgery. This practice has been associated with urinary tract infections. Catheter associated urinary tract infection (CAUTI) is one of the most common nosocomial infections accounting for up to 40% of all hospital acquired infections. The infection reaches bladder via two routes. Access is either gained intraluminally by entering the catheter system at catheter collecting tube junction or patient's own gut flora may colonize the periurethral area and reach bladder via external surface of the catheter, females being more prone due to close anatomic proximity. Urinary tract infections can be asymptomatic or symptomatic. Asymptomatic bacteriuria is defined as the presence of up to 100,000 colony forming units (CFU's) of a single pathogen per milliliter of two freshly voided midstream, clean catch urine specimens or a single catheterized specimen without symptoms of UTI.

Symptomatic urinary tract infection is the presence of significant bacteriuria with symptoms or signs of urinary tract infection. The symptoms or signs include at least one of the following with no other recognized cause: fever (>38°C), urgency, frequency, dysuria, suprapubic tenderness, or costovertebral angle pain or tenderness. Symptomatic infection may involve the lower urinary tract and cause cystitis, or it may involve the renal calyces, pelvis and parenchyma and cause pyelonephritis.

Besides, the risk of acquiring bacteriuria was estimated as 8.1% for each day the catheter remains in situ. The significance of catheter associated urinary tract infections following caesarean section is that the infections are usually asymptomatic, but are however, besieged with a gamut of complications. The complications in catheterized patients may include fever, acute

pyelonephritis, bacteraemia and death; patients are at risks for urinary tract stones, local periurinary infections, chronic renal inflammation, chronic pyelonephritis and over the years, bladder cancer.

The associated morbidity and mortality that follow all these complications that arise from the use of indwelling catheter are major drains on hospital resources. The duration of catheterization is the most important risk factor for the development of catheter associated bacteriuria. This study aims to determine the relation between duration of catherization and prevalance of UTI's in post operative caesarean section patients.

Materials & Methods:

This prospective study was carried out on 146 pregnant women in the Obstetrics department of a tertiary care centre in Mangalore from January 2017 to May 2017. All of them were counselled about the study. Socio demographic data of age, gestational age at the time of surgery, parity and educational status were noted **(Table 1).** The women were admitted and underwent caesarean section for various obstetric indications. All participants were catheterized under aseptic precautions five minutes prior to the surgery using Foley's Catheter size 16. The caesareans were done as per the conventional steps, under spinal anesthesia. The time of onset of surgery was designated as zero hour. The duration of surgery was defined as the interval between the onset of surgery till the completion of skin closure, measured by a standard clock. In the post operative period patients were monitored for 24 hours, being nil per oral for 12- 24 hours with adequate IV fluids. All patients received IV Inj Taxim 1 gm Q12 hrly for 2 days postoperatively. Postoperatively, they were allocated into two groups, Group A: Catheter was removed within 12 hours postoperatively; and Group B: Catheter was removed after 24 hours postoperatively.

After 72 hours postoperatively, midstream urine samples were collected for urine routine, culture and sensitivity for both groups. The results of these investigations obtained were compared & inferences were made. The cases with overt diabetes mellitus, renal disease, gestational diabetes mellitus, rupture of membranes > 4 hours, pre existing UTI and intraoperative injury to bladder were excluded from the study. The primary outcome measured was the presence of significant bacteriuria (>10,0000 bacteria of the same colony per millilitre of urine) The laboratory work was done in the department of microbiology and the women in our study were taught the proper way of collecting midstream urine sample and were provided two sterile culture bottles. About 10 ml of urine was collected in each sterile bottle and sent immediately to the laboratory for urine microscopy, culture and sensitivity. This was done using 10 ml of urine sample which was poured into a test tube and centrifuged for 5 minutes. The supernatant was discarded while a drop of the deposit was placed on a grease free slide and covered with a cover slip. Microscopic examination of the urine sample for the presence of red blood cells, bacteria, pus cells and

epithelial cells was done. The other urine sample was cultured onto Blood and MacConkey agar. Biochemical tests to identify the organisms were carried out and interpreted according to the manufacturer's recommendations. Treatment of the patients with UTI was by the attending obstetricians. Referral notes were sent to the managing teams and based on sensitivity results, appropriate antibiotics were initiated for those with significant bacteriuria. They were re-evaluated for clearance of bacteriuria after completion of a 10-day course of appropriate antibiotics. The patients were advised to report to the hospital immediately if systemic symptoms of infections develop thereafter.

Table 1: Demographic characteristics of the recruited patients.

	GROUP A (92)	GROUP B (54)
AGE		
<20 years	4 (4.3)	2 (3.7%)
20-25 years	60 (65.21%)	36 (66.66%)
25-30 years	28 (30.43%)	16 (29.62%)
GESTATIONAL AGE		
37-38 weeks	36(39.13%)	21(38.88%)
38-40 weeks	56 (60.86%)	33 (61.11%)
PARITY		
Nullipara	10 (10.86%)	5 (9.25%)
Para 1- 4	82 (89.13%)	49(54%)
EDUCATION		
Primary	75 (81.52%)	42 (77.77%)
Secondary	17 (18.47%)	12 (22.22%)

Results :

Out of the 146 women in our study, 16 (10.95%) patients had significant bacterial growth in the 72 hours postoperative urine culture results. There were 92 women in Group A (where catheter was removed within 12 hours) and 54 women in Group B (where catheter was removed after 24 hours post operatively). In Group A, out of 92 women, 7 (7.6%) patients had significant bacteriuria, whereas in Group B, out of 54 patients, 9 (16%) (**Table 2)** patients had significant bacteriuria. Out of the 7 women in Group A, 4 (57%) were asymptomatic while in Group B, 5 (55%) were asymptomatic. *Escherichia coli* was the most isolated bacteria found in 11(68.7%) out of the 16 samples followed by *Enterobacter aerogenes* in 2 (12.5%) samples which was then followed by *Staphylococcus aureus* in 2 (12.5%) samples and lastly *Pseudomonas* species in 1(6.25%) out of the 16 samples. **(Table 3 & 4)** The lowest level of antibiotic sensitivity was found with Amoxycillin-Clavulanic acid. There were no significant differences between the patient characteristics of the groups with regard to age, gestational age, parity, indication for caesarean, etc. Neither was there any significant difference between the groups after removal of catheter in the incidence of dysuria, urgency & urinary frequency.

Table 2: Primary outcome of significant bacteruria depending on duration of catherization.

	GROUP A	GROUP B
TOTAL RECRUITED	92	54
SIGNIFICANT BACTERIURIA	7 (7.6%)	9 (16%)

Table 3: Prevalence of microbiological isolates in the study

ISOLATES	PREVALANCE
Escherichia coli	68.7% (11)
Enterobacter aerogenes	12.5% (2)
Staphylococcus aureus	12.5% (2)
Pseudomonas species	6.25% (1)

Table 4: Bacterial isolates according to the groups

ISOLATES	GROUP A (7)	GROUP B (9)
Escherichia coli	6 (66.66%)	5 (55.55%)
Enterobacter aerogenes	1 (11.11%)	1 (11.11%)
Staphylococcus aureus	0	2 (22.22%)
Pseudomonas species	0	1 (11.11%)

Discussion:

The use of an indwelling urinary catheter during caesarean section is a common practice done in both elective and emergency delivery. The reasons for the use of indwelling catheter was to improve the exposure of the lower uterine segment at the time of the surgery, to reduce the possibility of traumatizing the bladder during the surgery, to assess the urinary output and to avoid post operative urinary retention. Despite the above benefits, catheter associated urinary tract infections have shown to be the cause of nosocomial infection worldwide. The incidence of the infection rises each day the catheter remains in the bladder. It's an established fact that majority of catheter associated urinary tract infections are asymptomatic and routine screening for asymptomatic bacteriuria is not practised. Despite overwhelming evidence clearly demonstrating its benefits in preventing symptomatic urinary tract infection means that early recognition and treatment may not be possible, thus the infection persists and lead to complications which include bacteraemia, acute or chronic pyelonephritis, urinary tract stones and chronic renal inflammation.

This study demonstrated a higher incidence of significant bacteriuria after 72 hours of the operation in women whose catheters were removed 24 hours after the operation compared with women whose catheters were removed within 12 hours after caesarean section. The findings from our study were comparable to 11.2% and 8.1% reported by Onile et al.[1] in Ife but these values were however, lower than 19.1% and 31.4% positive cultures reported by Tangtrakul et al.[2] observed in women who underwent immediate postoperative removal of urethral catheter and in women who had indwelling urethral catheter respectively.[3]

Most catheter associated bacteriuria have been noted to be asymptomatic. This was reflected in our study. This was in support of the findings by Tambyan et al. who noted that of the 235 new cases of CAUTI; more than 90% were asymptomatic. Asymptomatic nature of most patients CAUTI is derived from two physiological factors. First, the presence of catheter in the urethra prevents exposure of the urethral mucosa to large numbers of organisms in the infected urine, implicitly preventing infectious urethritis, which produces dysuria and urgency in infected non catheterized patients. Secondly, a patent urinary catheter ensures that the urinary tract is continuously decompressed preventing urgency and frequency associated with distension of an inflamed bladder as well as vesicoureteral reflux. There were no significant differences between the two groups after removal of the catheter in the incidence of dysuria, urinary frequency and urgency. This finding was similar to findings by Onile et al.,[1] who noted no significant difference between the two groups after removal of the catheter in the incidence of dysuria (P=0.19), urinary frequency (P=0.47), and urgency (P=0.13).

Escherichia coli was the most common isolate in our study followed by *Enterobacter* species. This was similar to the findings of Billotte-Domingo et al.[4] where *Escherichia coli* was found to be the most prevalent organisms associated with the use of indwelling catheter. It was however different from the findings of Taiwo et al.[5] where *Klebsiella* species were found to be the most prevalent pathogens associated with the use of indwelling catheter. Awonuga et al. in Ibadan also noted that *Klebsiella* species were the most prevalent cause of asymptomatic bacteriuria.[6] Most of these pathogens are part of the patients' endogenous flora but some may be acquired by cross contamination from other patients or by exposure to contaminated solutions or non-sterile equipment.

The most resistant antibiotic was Amoxicillin-Clavulanic acid. This contradicted the findings by other workers where Cephalosporins and Amoxycillin-Clavulanic acid had the highest sensitivity, but similar to Awonuga et al. report in Ibadan where the pathogens had higher sensitivity to Ofloxacin, Gentamicin and Nitrofurantoin but were resistant to Amoxycillin, Amoxycillin- Clavulanic acid and Erythromycin.

Conclusion :

It was hence appropriate to conclude that retaining catheter for less than 12 hours post caesarean was beneficial in the prevention of catheter related urinary tract infections.

References :

1) Onile TG, Kuti O, Orji EO, Ogunniyi SO. A prospective randomized clinical trial of urethral catheter removal following elective caesarean delivery. Int J Gynaecol Obstet 2008; 102: 267 –270
2) Tangtrakul S, Taechaiya S, Suthutvoravut S, Linasmita V. Post-caesarean section urinary tract infection: a comparison between intermittent and indwelling catheterization. J Med Assoc Thai. 1994;77:244-248
3) Tambyah PA, Maki DG. Catheter-associated urinary tract infection is rarely symptomatic: a prospective study of 1,497 catheterized patients. Arch. Intern. Med. 2000;160:678-682
4) Billotte-Domingo K, Mendoza. MT. Catheter –related urinary tract infection: incidence, risk factors and microbiological profile. Phil J Microbiol Infect Dis. 1999; 28(4):133-138

5) Taiwo SS, Aderounmu AO. Catheter-associated urinary tract infection: Aetiologic agents and antimicrobial susceptibility pattern in Ladoke Akintola University Teaching Hospital, Osogbo Nigeria Afr J Biomed Res. 2006;9:141-148
6) Oyetunji JA, Ahmed Y, Nwobodo EI, Ekele BA, Audu-Airede LR. Asymptomatic bacteriuria in pregnancy in Sokoto, Nigeria. Trop J Obstet Gynaecol. 2005;22: S23