

Outcome of use and non- use of indwelling Foley's catheter during cesarean section in Qena University Hospital : Randomized controlled trial

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Abstract :

Background: A prospective randomized study was used to effect of urinary bladder catheterization on UTI, time of first-void discomfort, time of ambulation, hospital stay, and urinary retention in women undergoing cesarean section.

Objectives: The aim of study was to assess the feasibility and outcome of cesarean section without Foley's Catheter.

Patients and Methods: This Study included 100womens who had the Foley's catheter inserted just before cesarean section and 100womens who had not use Foley's catheter during section in Obstetric and Gynacology department in Qena University Hospital. Prospective method were used to assess patient discomfort with the first postoperative void after , time of ambulation , time hospital stay and need for catheterization.

Result: This study included 200 patients 100 patient with urinary catheter and 100 without urinary catheter mean age of the studied group 25.8 ± 5.5 , mean gestational age 37.9 ± 1.1 weeks, mean for No. of C.S $1.08 \pm .7$, mean duration of C.S 48.5 ± 5 minutes. 99% of patients have no bladder injury while 1% have bladder injury.99%of patients complaining of urine retention .mean time of retention 4.8 minutes .mean for post voiding volume 18.02 cc. 4%of patient complaining of voiding difficulty.6.5% of patients complaining of dysuria . urine analysis before C.S(pus cell) 4.2 ± 1.43 Urine analysis after 1 week 33.3 ± 5.8 Uncatheterized patients had a shorter hospital stay.

Conclusion: Routine use of indwelling urinary catheter in cesarean section patient with a stable hemodynamic condition is not necessary.

Keywords: Cesarean; Urinary infection; Urinary catheter .

Introduction

Cesarean section (CS) has become the most common obstetric surgery done by obstetric and Gynecology doctors. Cesarean Section has seen a soar in the past few decades, varying from 41.9 -53% across the world (Allen et al., 2012).

Each surgery requires a certain set of preoperative preparation. One of such preoperative preparation practice done routinely without proper evidence is the placement of indwelling urinary catheter prior to cesarean section. The reasons cited are

better bladder exposure during surgery, decreased risk of intraoperative injury to the urinary system urinary output assessment and prevention of postoperative urinary retention (Al-Shaikh et al.,2009) .

Catheter Associated urinary tract infection (CAUTI) is one of the most common nosocomial infections accounting for up to 40% of all hospital acquired infections. Eighty percent of these are associated with the use of urinary catheters. Risk of infection is about 5-10% with each day of indwelling catheterization and 1-3%

with each insertion in intermittent catheterization. Infection reaches bladder via two routes. Either access is 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 catheter, females being more prone due to close anatomic proximity.

Indwelling catheterization may lead to urinary colonization leading to spectrum of asymptomatic bacteriuria to symptomatic Catheter Associated UTI (CAUTI). Symptomatology of acute urinary tract infection includes urgency, frequency, dysuria, pelvic or flank pain and fever. Besides these morbidities, it can lead to potentially serious complications like pyelonephritis, renal failure, dyselectrolytemia, septicemic shock, and respiratory distress. This study was carried out with the aim to evaluate the feasibility and benefits of carrying out primary Cesarean deliveries without routine indwelling urinary catheterization (**Minardiet al., 2011**).

Furthermore this practice imposes the cost of urinary catheters, urine bags and antimicrobial therapy for UTI, besides patient's discomfort and delayed ambulation. This is particularly important in developing countries (**Lau et al., 2004**).

Patients :

The study is randomized controlled trial that were I use recruited cases

Patients were be divided into two groups

Group A: those did not had Foley's catheter and group B : those had Foley's catheter .

100womens who had the Foley's catheter inserted just before cesarean section.

100womens who did not haduse Foley's catheter during section in Obstetric and Gynecology department in QenaUniversity Hospital.

Inclusion criteria:

Woman who had undergone less than previous three cesarean section.

Gestation age (37 to 42) weak

Exclusion criteria:

-Pregnant with previous urologic surgery.

-The duration of cesarean section \geq 90 minute.

-Pregnant with diagnosis of pyelonephritis during this pregnancy or known chronic renal disease as chronic pyelonephritis and urolithiasis .

-Pregnant with any two of the following genitourinary symptoms: dysuria, urgency, slow stream, incontinence, frequency, incomplete voiding.

Pregnant with pus cell over count in urine analysis.

Methods:

All of patients had been subjected to the following:

- Derailed history taking with emphasis on : Obstetric history , history of present condition to fulfill inclusion and exclusion criteria , medical history to fulfill inclusion and exclusion criteria, full physical examination: Vital sign, General examination, Local examination .
- Routine Laboratory investigation: Complete blood picture, complete urine analysis.
- Ultrasound.

Then patient had the following steps:

- Urine analysis before and after cesarean section
- Patients divided into two groups.
- Women's had followed up by transabdominal ultrasound every 2hour to detect possibility of urinary retention until the patient able to micturate then post voiding ultrasound to assess the residual volume.
- All cases had cesarean section under general or spinal anathesia addition of intrathecal morphine or naluphine.
- The urinary bladder volume calculated depend upon the following equation :

$$\text{volume} = \text{XYZ multiplied by } 0.5$$
 which

$$X = \text{height of bladder}$$

$$Y = \text{width of bladder}$$

$$Z = \text{depth of bladder}$$

Depending upon the functional bladder capacity which is 400 : 600 cc and the post voiding urine should be less than 50 cc and the trigger for catheterization will be ≥ 400 cc day following and ≥ 50 cc post voiding .

Statistical analysis:

All Patients had been analyzed using Statistical Package for Social Sciences

(SPSS).

Result:

- This study included 200 patients 100 patient with urinary catheter and 100 without urinary catheter
- mean age of the studied group 25.8 ± 5.5 ,mean gestational age 37.9 ± 1.1 weeks, mean for No. of C.S $1.08 \pm .7$, mean duration of C.S 48.5 ± 5 minutes. 99% of patients have no bladder injury while 1% have bladder injury.99%of patients complaining of urine retention .mean time of retention 4.8 minutes

.mean for post voiding volume 18.02 cc. 4%of patient complaining of voiding difficulty.6.5% of patients complaining of dysuria. Urine analysis before C.S(pus cell) 4.2 ± 1.43 urine analysis after 1 week 33.3 ± 5.8 .

Table (1) Preoperative and intraoperative data

| | With Catheter | Without catheter | P-Value |
|------------------------|------------------------|------------------------|---------|
| | Mean \pm SD N (%) | Mean \pm SD N (%) | |
| Age (years) | 25.8 (5.4) | 25.8 (5.6) | .935 |
| Gestational age(weeks) | 37.7 (1.1) | 38.1 (1.1) | .149 |
| No. of C.S | 1.06 (.7) | 1.10(.7) | .726 |
| Parity | 1.6(1) | 1.7 (.9) | .402 |

Table (1) show that The mean of age in patient with catheter and in patient without catheter is 25.7 ± 5.4 and 25.8 ± 5.8 respectively There was no statistically significant difference between the two groups of our study as regard the age (P-value = 0.935) . As regard the gestational age , the mean for patient with catheter and patient without catheter 37.7 ± 1.1 and 38.0 ± 1.1 respectively . There was no statistically significant difference between the 2 study groups as regard the gestational age (P-value = .149) .the mean number of C.S for patient with catheter and patient without catheter $1.06 \pm .7$ and $1.10 \pm .7$ respectively . There was no statistically significant difference between the

2 study groups as regard the number of C.S (P-value = .726). as regard to parity the mean for cases with catheter is 1.6 ± 1 and for cases without catheter is $1.7 \pm .9$ with no statistically significant difference between the 2 study groups.

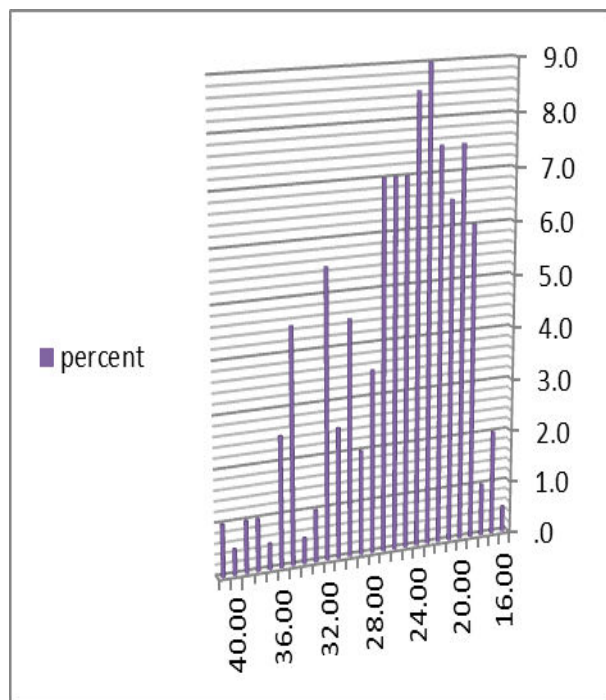


Figure 1. Age distribution among the studied group .

Table 2. Operative data of studied group

| | | With Catheter | Without catheter | P-Value |
|---------------------------|-----|------------------------|------------------------|---------|
| | | Mean \pm SD N (%) | Mean \pm SD N (%) | |
| Duration of C.S (minutes) | | 48.6 \pm 4.4 | 46.2 \pm 4.4 | .919 |
| | | | .4 | |
| Bladder injury | Yes | 0 | 1 (00) | .151 |
| | No | 100(100%) | 99 (99%) | |
| Ureteric injury | Yes | 0 | 1 (00) | .151 |
| | No | 100(100%) | 99(99%) | |

| Type of anesthesia | region | al | Gener al | P-value |
|--------------------|----------|----------|----------|---------|
| | 99 (99%) | 98 (98%) | 1(1%) | .651 |
| | | | 2(2%) | |

Table (2) show that the mean duration .of C.S for patient with catheter and patient without catheter is 48.6 ± 4.4 and 46.2 ± 4.4 respectively with no statistically significant difference between the 2 study groups as regard the duration r of C.S (P-value = .919) . As regard to bladder injury and ureteric injury , in patient with catheter n0 patients had bladder injury while in patient without catheter 1% of cases had no bladder injury with no statistical significant difference between the studied 2 group as regard to bladder injury (p value =.151) . as regard to type of anesthesia 99% of cases with catheter took regional anesthesia and 98% of cases without catheter took regional anesthesia with no statistically significant difference between 2 groups (p value + .651).

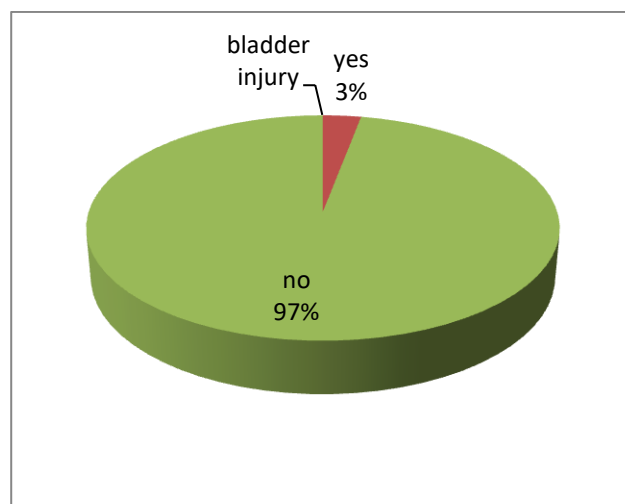


Figure 2. Bladder injury in cases with catheter.

Table 3. Post-operative data of studied group

| | With Catheter | | without catheter | P-Value |
|---|---------------|------------|------------------|---------|
| | N (%) | N (%) | N (%) | |
| Hospital stay (days) | 5.3±2.3 | 3.5±1.3 | | .001 |
| Development of retention | Yes | 0 (00) | 3 (3.0%) | .151 |
| | No | 100 (100%) | 97 (97.0%) | |
| Voiding difficulty | Yes | 7 (7%) | 1 (1%) | .028 |
| | No | 93 (93%) | 99 (99%) | |
| Frequency and dysuria | No | 4 (4%) | 10 (10%) | .369 |
| | Yes | 96 (96%) | 90 (90%) | |
| Time of retention (min) | 00 (00) | 4.8±3 | | .138 |
| Post voiding volume (CC) | 24.6±20.6 | 15.5±1.8 | | .789 |
| Urine analysis (pus cell) Before C.S | 4.4±1.8 | 3.9±1.1 | | .206 |
| Urine analysis (pus cell) after 1 week | 45.5±6.3 | 9.7±5.7 | | .000 |

Table (3) shows that mean periods of hospital stay for catheterized and catheterized groups is 5.3±2.3 and 3.5±1.3 respectively with statistically significant difference between the 2 groups. development of urine retention , in patient with catheter no patients had retention while in patient without catheter 3% of cases had urine retention with no statistical

significant difference between the studied 2 group as regard to bladder injury .

(p value =.151). As regard to voiding difficulty, in patient with catheter 7 patient had voiding difficulty while in patient without catheter 1 of cases had voiding difficulty with statistical significant difference between the studied 2 group as regard to bladder injury (p value =.026) . As regard frequency and dysuria , in patient with catheter 4 patient had frequency and dysuria while in patient without catheter 10 of cases had frequency and dysuria with no statistical significant difference between the studied 2 group as regard to frequency and dysuria (p value =.369) . As regard the time of retention , the mean for patient with catheter and patient without catheter 0 and 4.8±.3 minutes respectively . There was no statistically significant difference between the 2 study groups as regard the time of retention (P-value = .138). As regard the post voiding volume, the mean for patient with catheter and patient without catheter 24.6±20.6 and 15.4±11.8 respectively. There was no statistically significant difference between the 2 study groups as regard the post voiding volume (P-value = .789). As regard urine analysis before C.S , the mean for patient with catheter and patient without catheter 4.5±1.8 and 3.9±1.05 respectively . There was no statistically significant difference between the 2 study groups as regard the urine analysis before C.S (P-value = .206). As regard urine analysis after 1 week of C.S , the mean for patient with catheter and patient without catheter 45.5±36.3 and 9.7±5.7 respectively . There was statistically significant difference between the 2 study groups as regard the urine analysis after C.S (P-value = 000).

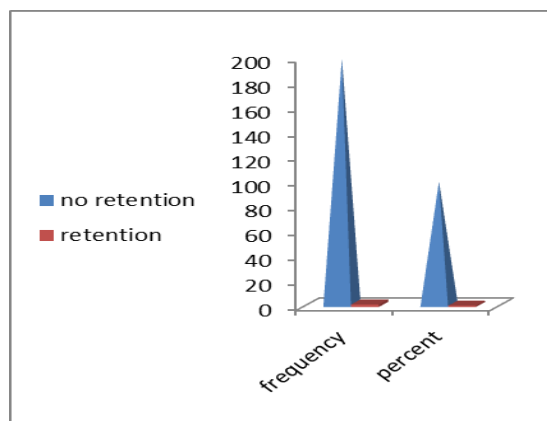


Figure3. Percent and frequency of patient who develop urinary retention

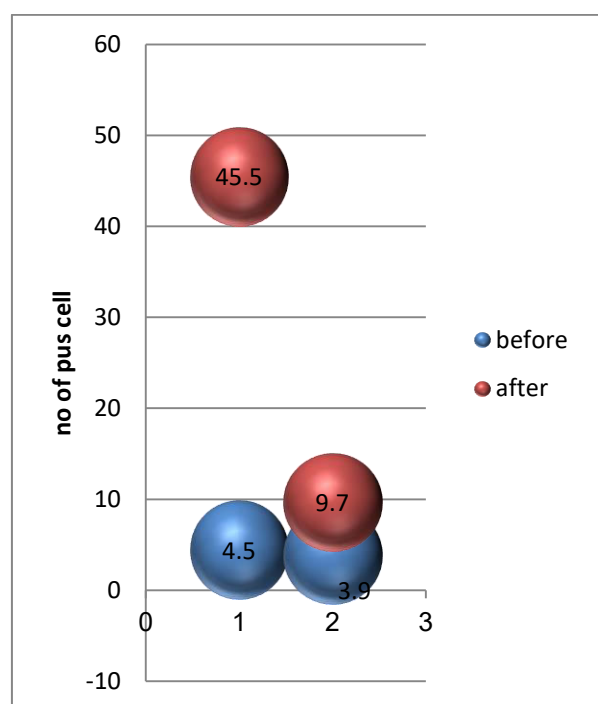


Figure4.No. of Pus cell in urine analysis before and after Cesarean section (C.S.

Table 4. Regression analysis of the possible risk factors for UTI .

| | | |
|-----------------------|--------|-------|
| Voiding difficulty | 1.016 | 578.0 |
| Frequency and dysuria | 0.683 | 656. |
| Age | -007.- | 865.0 |
| Gestational age | 233.0 | 217.0 |
| Number of C.S | 012. | 967.0 |
| Post voiding time | 0.03 | 789.0 |

As regard to regression analysis the possible risk factors are urine analysis before and urine analysis after p- value,.006 and 000 respectively. The excluded risk factors are bladder injury, voiding difficulty, Frequency and dysuria,age,gestational age, number of C.S, duration of C.S and Post voiding time.

Discussion:

The common indications for indwelling urinary catheter use included: to assess urinary output, to improve exposure at the time of surgery, to prevent postoperative urinary retention, and to reduce the possibility of injury to the urinary system during the surgery. Infection of the lower urinary tract is a frequent complication of gynecologic and obstet – ric surgeries, and catheters should only be placed when necessary (Rosseland et al., 2002).

In our study the nonuse of indwelling foley's catheter was significantly superior than use of indwelling during the cesarean section as regards the shorter hospital stay and the lower rate of UTI(Çelen et al., 2011) .

The study confirmed that using an indwelling urinary catheter is an unnecessary part of the cesarean delivery process , as there was no inter- ference with surgical exposure of the lower uterine segment , and no injury to the urinary tract(Changchien et al .,2007) . there were no significant difference as regard bladder injury , uretic injury postoperative

| Model | Beta | P value |
|-----------------------|--------------|---------|
| Urine analysis before | -195- | .006 |
| Duration of C.S | -138 - | 100. |
| Urine analysis after | 086. | 000 |
| Bladder injury | - 240.269 | 1.000 |

retention of urine ,post voiding volume , or discomfort at first voiding(**Lamonerie et al., 2004**).

The most important findings was that women who were offered cesarean delivery without use of a urinary catheter were generally pleased and satisfied with the prospect of this method there were no correlation between type of anise – thesia , length of operation , prior cesarean delivery , previous laparotomy , age , indication for cesarean , and the need for urinary catheterization after operation(**Kamphuis et al.,1998**).

Recently, studies have suggested in patients without a catheter was significant(**Pavlin et al., 1999**).

Conclusion:

In our study the nonuse of indwelling foley's catheter was significantly superior than use of indwelling during the in cesarean section as regards the shorter hospital stay and the lower rate of UTI.

There were no significant difference as regard bladder injury, uretic injury postoperative retention of urine, post voiding volume, or discomfort at first voiding.

Recommendation:

Our results suggest that the routine use of indwelling urinary catheters for caesarean delivery in haemodynamically stable patients is not necessary, and can be harmful. However, better and larger randomised trials are needed to confirm these findings.

Limitation:

The smaller number of both groups present generalization of the result another limitation is that symptoms are less sensitive method

for or UTI and significant bacteriuria is best method for diagnosis of UTI .

Furthermore different surgeons were involved in the surgical operations of the control group, and they all administered different oral analgesic medications postoperatively .

References :-

Allen VM, Yudin MH, Bouchard C, Boucher M, Caddy S, Castillo E, Money DM, Murphy KE, Ogilvie G, Paquet C, Van Schalkwyk J, Senikas V. (2012), Infectious Diseases Committee, Society of Obstetricians and Gynaecologists of Canada. Management of group B streptococcal bacteriuria in pregnancy. *J ObstetGynaecol Can.* May, 34(5):482-6.

Al-Shaikh G, Larochelle A, Campbell CE, Schachter J, Baker K, Pascali D. (2009). Accuracy of Bladder Scanning in the Assessment of Postvoid Residual Volume. *J ObstetGynaecol Canada*, 31:526–53.

Çelen Ş, Oruç AS, Karayağın R, Saygan S, Ünlü S, Polat B, Danişman N. (2011). Asymptomatic Bacteriuria and Antibacterial Susceptibility Patterns in an Obstetric Population. *ISRN Obstet Gynecol*.

Changchien CR, Yeh CY, Huang ST, Hsieh ML, Chen JS, Tang R. (2007). Postoperative urinary retention after primary colorectal cancer resection via laparotomy: a prospective study of 2,355 consecutive patients. *Dis Colon Rectum.*, 50:1688-1696.

Kamphuis ET, Ionescu TI, Kuipers PW, de Gier J, Van Venrooij GE, Boon TA. (1998). Recovery of storage and emptying functions of the urinary bladder after spinal anesthesia with lidocaine and with bupivacaine in men. *Anesthesiology*, 88:310-316.

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Lamonerie L, Marret E, Deleuze A, Lembert N, Dupont M, Bonnet F(2004). Prevalence of postoperative bladder distension and urinary retention detected by ultrasound measurement. *Br J Anaesth*, 92:544-546.

Lau H, Lam B. (2004). Management of postoperative urinary retention: a randomized trial of in-out versus overnight catheterization. *ANZ J Surg*, 74:658-661.

Minardi D, D' Anzeo G, Cantoro D, Conti A, Muzzonigro G. (2011). Urinary tract infections in women: etiology and treatment options. *Int J Gen Med*, 4:333-431-
RS. *NeurourolUrodyn.*, 31:317-321.

Pavlin DJ, Pavlin EG, Gunn HC, Taraday JK, Koerschgen ME. (1999). Voiding in patients managed with or without ultrasound monitoring of bladder volume after outpatient surgery. *AnesthAnalg*, 89:90-97

Rosseland LA, Stubhaug A, Breivik H. (2002). Detecting postoperative urinary retention with an ultrasound scanner. *ActaAnaesthesiolScand*, 46:279-282