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Original Research Article

A Prospective Comparative Analysis of Urinary Catheter Removal Timing: 12 Hours vs. 24 Hours Post-Elective Cesarean Section

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Abstract:

Background & Objective: To compare the outcomes of urinary catheter removal at 12 Hours versus at or >24 Hours post elective cesarean section. To assess and compare symptomatic UTI, time of ambulation, length of hospital stays and need for recatherization amongst these 2 groups.

Methods: In all patients undergoing elective primary cesarean section, Preoperative urine routine and microscopy¯ were sent, UTI was ruled out, clinical examination was performed and were NPO at least 8hours prior to surgery and given antibiotics. A foley catheter was inserted on the operating table immediately before starting cesarean section. Cesarean sections were performed in the usual manner under spinal anesthesia. After this, in Group 1 patients, catheter were removed 12hours post-operatively while in Group 2 it was removed 24 hours post-operatively. After catheter removal, women were encouraged to void and helped to ambulate.

Results: 2 groups were compared and the overall rates of post caesarean section urinary complaints dysuria (8.69%), urinary frequeny (14.13%), urgency (10.86%), burning micturition (9.76%) were higher in 24 hours catheter removal group. The Mean duration of first Post-op voiding time (4 hours), ambulatory time (4 hours) and hospital stay (4 days) were shorter in 12 hours catheter removal group.

Conclusion: Urinary catheter removal post Caesarean section at duration of 12 hours postoperatively is associated with decreased complications and morbidity in post Caesarean section women.

Keywords: Caesarean section, UTI.

Introduction

Worldwide, caesarean sections are now the most frequently performed obstetric procedures.[1]Rates of caesarean sections have been continuously rising. As a result of improved anesthetic management and the use of prophylactic antibiotics before surgery to avoid infections, maternal mortality related to caesarean delivery isnow uncommon. However, there are still some morbidities that can be avoided, such as urination problems and UTIs. To lower the risk of these morbidities and avoid postoperative complications, interventional measures should be used.

The use of urinary catheter (flexible elastic tube used to drain urine from bladder) during and after cesarean section is routinely used. [1] Alleged benefits of using catheter includes, maintains bladder drainage that improves visualization during surgery and minimizes bladder injury, less urinary retention post-operatively but it could be associated with increased incidence of CAUTI (Catheter Associated Urinary Tract Infections), urethral pain, voiding difficulty after removal, delayed ambulation and increased hospital stay. [2]

There is currently no agreement on a precise time for catheter removal. According to certain research, after a caesarean section under spinal anaesthesia, urine retention and bacteriuria occur more frequently, and the catheter stays in place longer [3]. According to some studies, removing the urine catheter earlier may promote early ambulation and reduce the length of the hospital stay [3]. There were several studies suggesting that routine use of urinary catheter in all caesarean sections is not essential[2].Our goal is to strike a balance between the length of urethral catheterization and the benefits of early ambulation, reduced bacteriuria rates, shorter hospital stays, and decreased incidence of urine retention following surgery. Therefore, we will compare the morbidities and benefits of removingthe urinary catheter after two different lengths of time in our study.

Objectives

To compare the outcomes of urinary catheter removal at 12 Hours versus at or >24 Hours post elective cesarean section.

- To assess and compare symptomatic UTI.
- To assess and compare time of ambulation.
- To assess and compare length of hospital stay.
- To assess and compare rate of recatheterisation.

Materials and Methods

This study was a prospective study conducted over a period of 2 years and 2 months on 184 women admitted in antenatal ward for primary elective cesarean sections in the Department of Obstetrics and Gynecology, Darbhanga medical college and Hospital, Laheriasarai, Bihar.

Inclusion Criteria

Those who are willing to give consent.

Primigravidae women with term pregnancyprepared for elective cesarean section.

Exclusion Criteria

- Women who had preoperative urinary tractinfections, bladder injuries during surgery.
- Women with any medical condition where post op urine output measurement is essential like Preeclampsia, eclampsia, gestational hypertensionand GDM.

Methodology

Institutional review board and ethical committee clearance was taken. Women undergoing antenatal care on the basis of inclusion and exclusion criteria were selected. Informed consent of the patient was taken. A detailed assessment of patient was performed includinghistory, general examination and obstetrics examination. Routine investigations and a mid- stream urine analysis were done to rule out UTI in preoperative patients.

Patients enrolled in the study were divided into 2 study groups:

Study Group – Patients in which catheter wasremoved 12 HOURS postoperatively.

Control Group – Patients in which catheter was removed 24 HOURS postoperatively.

Outcome Measures

- Symptomatic urinary tract infections - Significant bacteriuria, presence of 10^5 CFU of bacteria per ml (clean catch midstream urine sample postoperatively 48 HOURS.)
- Other outcome measures as Dysuria (defined as painful micturition); frequency (micturition more than 7 times during the day or more than twice during night); urgency (severe irresistible urge to micturate); burning micturition.
- Post-operative first ambulation time.
- Length of hospital stay- from day of surgery till discharge.
- Rate of re-catheterization (those who fail to pass urine >8 hrs after catheter removal.

Statistical Analysis

Continuous variables were summarized as mean and were analyzed by using unpaired t-test. Nominal / categorical variables were summarized as proportions and were analyzed by using chi- square/ Fischer exact test. P-value <0.05 will be taken as significant.

A total of 184 women were participated in the study group. They were dividing into two groups byrandom allocation table.

In Group I: Catheter removal was done 12hours postoperatively in 92 women.

In Group II: Catheter removal was done 24hours post operatively in 92 women.

Patient Preparation: All the women who were included in the study, preoperative urine routine and microscopy were sent and UTI was ruled out. Any patient under theexclusion criteria were excluded from the study. In all participants, clinical examination wasperformed. Non stress test was performed on the day of admission. Recently performed haematocrit and serology, blood grouping and typing is checked. Informed consent for cesarean section and anesthesia were obtained. They were kept nil per orally at least 8 hours prior to surgery. Antibiotic prophylaxis of 1g injection Ceftriaxone intravenous is given 30 minutes priorto surgery after the test dose. In all women who were undergoing elective cesarean section, a foley catheter (French size 16) was inserted understerile precautions on the operating tableimmediately before starting cesarean section.

Cesarean sections were performed in the usualmanner under spinal anesthesia. Abdomenopened by pfannensteil incision. Then dissecting through different layers of abdomen until the uterus is reached. Uterus is closed with vicryl. Abdomen closure was done.

After this, in Group 1 patients, catheter was removed 12hours post-operatively while in Group 2 it was removed 24 hours post-operatively. After catheter removal, women were encouraged to void and helped to ambulate. Their ambulatory time was noted and their first voiding time was noted in both categories. If even after 8 hours of removal, if they are not able to void or if there is palpable bladder, recatheterization is necessary. (Urinary retention means – difficulty to void 8 hours after catheter removal or residual urine ≥200ml.) In both the groups urine analysis was done 48 hours post-operatively and results were compared.

Results

During the study period, a sum of 184 women finally enrolled in this trial. Out of which, in 92 of them

catheter was removed 12 hours post-operatively and in 92 women delayed catheter removal after 24 hours post-operatively was done. The two groups were matched and there were no significant differences between the two groups regarding maternal age and gestational age.

Table 1: Distribution of Patients According to their Post-Op Urinary Complaints

	Disease present	Disease absent	Totals	Chi-square statistic	Degrees of freedom	P-value
DYSURIA = GROUP I	1	91	92	4.2057	1	0.0403
DYSURIA = GROUP II	8	84	92			
Totals	9	175	184			
URINARY.FREQUENCY = GROUP I	3	89	92	5.5446	1	0.0185
URINARY.FREQUENCY = GROUP II	13	79	92			
Totals	16	168	184			
URINARY.URGENCY = GROUP I	2	90	92	4.3682	1	0.0366
URINARY.URGENCY = GROUP II	10	82	92			
Totals	12	172	184			
BURNING.MICTURATION =GROUP I	1	91	92	5.1816	1	0.0228
BURNING.MICTURATION =GROUP II	9	83	92			
Totals	10	174	184			

GROUP I and GROUP II were reviewed post- operatively in view of signs and symptoms ofurinary tract infections like dysuria, urinaryfrequency, urinary urgency and burningmicturition.

As seen in Table 1 patients had the following signs and symptoms-

Dysuria - Total 9 patients had complained of dysuria out of which 8 patients were of group II. Significant difference was noted with a p-value of 0.04. Urinary frequency- Total 16 patients complained of increased frequency of urination and out of them 13 patients were of group II. Significant difference was noted with a p-value of <0.018. Urinary Urgency- Total 12 patients complainedof urgency in micturition and out of them 10 patients were of group II. Significant difference was noted with a p-value of 0.036. Burning Micturition- - Total 10 patients complained of

burning micturition and out of them 09 patients were of group II. Significant difference was notedwith a p-value of 0.022.

Post-operative urinary complications aftercatheter removal and symptomatic UTI were higher in group II.

Table 2: Distribution of Pati ents According To Their First Post-Operative Ambulation

	Number Of Patients	
1st Post-Ambulation Time In Hrs	**Group I**	**Group II**
0-2	20	10
2-4	31	11
4-6	18	38
6-8	17	20
8-10	2	
10-12	4	13
Grand Total	92	92
P value	<0.001	Means statistically different

Mean duration of post-op 1st ambulation in patients of group I was 4 hours while in group II was 6 hours. Significant difference was noted with a p value of <0.001. Ambulation period was shorter than in 12 hours catheter removal group. Mean duration of hospital stay in GROUP I wasof 4 days, whereas in GROUP II it was of 5 days.

P-value of <0.001 was noted and therefore duration of hospital stay is significantly shorter in12 hours post-operative catheter removal group.

Table 3: Distribution of Patients According to Post-Operative Bacteriuria

	Number of Patients	
Post Op Bacteriuria Results	**Group I**	**Group II**
Negative	90	81
Positive	2	11
Grand Total	92	92

Post-operative bacteriuria was noted in 11 patients of the group II and only 2 patients of group I. Significant difference was seen with p- value of 0.0214.

Discussion

This study is undertaken to determine whether 12 hours post-op catheter removal decreases the occurrence of urinary tract infection, shortens first post-operative voiding time, ambulation time, duration of hospital stay and the need for recatheterization for urinary retention.

In this study, women admitted in the common labour room ward for elective cesarean section were selected after screening for eligibility and consent was taken and complete physical and obstetric examination was done. A pre-operative urine routine and microscopy was done along with other blood investigations. Total 184 womenparticipated in the study and in all participants foley catheter was inserted by resident doctor prior to caesarean section. In Group I: In 92 women catheter removal was done 12hours postoperatively. In Group II: In 92 women catheter removal was done 24 hours postoperatively.

In the present study, we compared the age group, parity and gestational age between the two groups, and they were matched and there is no significant difference.

Indication for CS

In our study, 28.2% and 30.4% C.S. were due to malpresentation in group I and II respectively,8.6% and 11.9% C.S. were due to cephalopelvic disproportion respectively,17.3%and 15.2% C.S. were due to abnormal cardiotocographyfindings,19.5 % and 21.7% C.S. were due to oligohydramnios.

About 26% of patients of group I and 20.65% patients of group II had Other indications for CS of which maternal request and contracted pelvis were most common. About 11.10% and 13.40% patients had malpresentation in Khaled et al [4] study while 10.9% and 13.4% patients had malpresentation asindication in Ahmed et al study [6]. Similarly 19.7% and 19.4% patients had CPD in Khaled et al [4] study and about 26.2% and 19.4% in Ahmed et al [6] study.

Need for Recatheterization-

It was evident in our study that only 1.08% of group II required recatheterization for urinary retention in comparison to 4.30% patients of group I. No statistically significant difference was found between 2 groups. Emeka et al study showed about 7.3% and 0% need for recatheterization in 8 hrs catheter removal group and 24 hrs catheter removal group respectively, P value = 0.001. Similar to our study results Alper Basbug et al [6] study showed about 4.8% and 1.3% need in 2hrs versus 12hrs catheter removal group,results were not statistically significant with Pvalue of 0.59.

Post-op Urinary Complaints

In our study 4 most common complaints relatedto UTI were taken into consideration, these were dysuria, urinary frequency, urinary urgency and burning micturition. In our study, dysuria wasseen 1.08% and 19.5% in group I and group II respectively. Similarly, in Khaled[4] Study dysuria was seen in 1.20% in 6 hrs post op catheter removal group and 17.90% in 24 hrs postoperative catheter removal group. Increased urinary frequency was noted in 3.20% and 14.1% in group I and group II respectively. Similarly, in

Post-op Ambulation

In our study mean post-operative ambulation timein group I was 4 hours while in group II it was 6 hours. Significant difference was seen showing that 12 hours catheter removal group patients were able to ambulate earlier. Similar results were seen in Alper basbug6 study where mean (SD)duration of post op first ambulation time in early catheter removal group was 6.41+/-1.87 hrs and 8.08+/-3.48 hrs in delayed Catheter removal group.

Duration of Hospital Stay

In our study, mean duration of hospital stay was 4 days and 5 days in group I and group II respectively. Statistically significant difference was seen showing that 12 hours catheter removal group patients had shorter duration of hospitalstay and was discharged earlier. Similar results were seen in Divya Pandey et al [7] study in which mean (SD) duration of hospital stay of non- catheterised patients was 3.99+/- 1.28 days and 5.2+/- 2.43 days in patients catheterised for 24hrs.

Conclusion

Thus, it is concluded from the above study that urinary catheter removal post Caesarean sectionat a duration of 12 hours postoperatively is associated with less urinary symptoms (symptomatic bacteriuria), early ambulation, earlier post op voiding time

less rates of bacteriuria and therefore reduced hospital stay and less postoperative complications thereby resulting in decreasing morbidity in post Caesarean section women.

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