e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2024; 16(3); 1125-1128

Original Research Article

Immediate Versus Delayed Removal of Urinary Catheter Following Caesarean Delivery: A Comparative Analysis

S. Venkata Krishnaiah[1], Arun Sirandas[2], Sunitha Vasa[3]

[1]Assistant Professor, Department of Urology, Mamatha Medical College, Khammam, Telangana, India
[2]Resident, Department of Urology, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India
[3]Assistant Professor, Department of Obstetrics and Gynaecology, Malla Reddy Institute of Medical Science, Suraram, Hyderabad, Telangana, India

Received: 25-12-2023 / Revised: 23-01-2024 / Accepted: 26-02-2024
Corresponding Author: Dr. Sunitha Vasa
Conflict of interest: Nil

Abstract:

Introduction: Urinary catheterization for prolonged period may induce delayed ambulation in patients due to pain and concern of removing the catheter accidentally while moving. It can also increase the colonisation of bacteria in urine, which can lead to UTIs and raise healthcare costs. The present study was designed to assess the advantages of immediate removal versus delayed removal of urinary catheter in the elective caesarean section.

Material and Methods: One hundred and thirty-six women between 21-40 years age group undergoing elective caesarean section were randomly divided in to immediately urinary catheter removal group delayed removal after18-24 hours after the caesarean section. Parameters including first postoperative voiding time, ambulation time, significant bacteriuria, patient feedback on catheter usage, and duration of hospital stay were recorded and analysed.

Results: The difference of re-catheterization, and dysuria was statistically not significant ($p>0.05$), while burning micturition was statistically significant ($p=0.0167$). The first voiding time of urine was 3.98 in group A and 10.2 in group B. Ambulation time was 8 in group A and 18 in group b. The duration of hospital stay was 4.1 days in group A and 5.6 days in group B.

Conclusion: The immediate removal of catheter after elective caesarean section is associated with lower risk of urinary infection and earlier postoperative ambulation than the delayed removal.

Keywords: Caesarean section, Urinary catheterization, Ambulation time, Duration of hospital stay.

Introduction

Urine catheterization is often used during caesarean sections for a variety of reasons, including to alleviate pressure on the bladder, which allows for better visualisation of the lower uterine region, to reduce the likelihood of bladder damage [1], and to reduce postoperative urine retention [2,3]. However, the duration of a catheter is used in the post-operative period varies greatly, starting immediately after the procedure and continuing for at least twelve hours longer.

No definite advice has been made about the ideal duration of urethral catheterization [4]. Even with simple caesarean procedures, the literature is divided on how long to keep the catheter in place. Conventional wisdom, rather than scientific research, is the basis of many of the behaviours [5]. Because of this, the practical use differs across medical professionals. In an effort to lessen the likelihood of problems, some surgeons remove catheters immediately after surgery; others wait 12 to 24 hours to prevent urine retention [6]. It prolongs a mother's stay in the hospital and raises her risk of maternal morbidity and death [7,8]. A urethral catheter should not be used after every caesarean section, according to a number of studies. In order to decrease the occurrence of UTIs, it is common practice to remove catheters early [9]. With reference to the above literature present study was designed to assess the advantages of immediate removal versus delayed removal of urinary catheter in the elective caesarean section.

Materials and Methods

The present study was conducted in the department of OBG in association with Department of Urology at Mamatha Medical College, Khammam during August 2016 to June 2019. A source of 136 women between age group 21-40 years undergoing elective caesarean section at antenatal clinic of

Department of OBG was included. Cases of primary or repetitive caesarean section undergoing elective caesarean section were included. Cases with preeclampsia, gestation diabetes, gestational hypertension, vaginal bleeding, urinary infections and not willing to participate were excluded. Written informed consent was obtained from all the participants and study protocol was approved by institutional ethics committee.

The study participants were randomly divided into two groups. In group A catheter was removed immediately after the caesarean section. In group B, catheter was removed 18-24 hours after the caesarean section.

All the participants were undergone details clinical examination, laboratory investigations, and pre-operative checkup. Urine microscopy examination was conducted before the procedure. NPO was administered 8 hours before the procedure. Antibiotic prophylaxis of 1g cefazolin is given 30 minutes prior to procedure after the test dose. Caesarean sections were performed in the usual manner under spinal anesthesia.

Catheter was removed immediately after the procedure in the group A, and 18-24 hours after the procedure in group B. Parameters including first postoperative voiding time, ambulation time, significant bacteriuria, patient feedback on catheter usage, and duration of hospital stay were recorded. The collected data was analysed by using SPSS version 29.0. Categorical variables were represented in the frequency and percentages using descriptive statistics and continuous variable were represented in Mean, SD. The student's t test was used to check the significance between the study parameters. The $p<0.05$ was considered as statistically significant.

Results

Table 1: Demographic and obstetric profile of study participants

Parameters	Group A (n=68)		Group B (n=68)		p-value
	Frequency	Percentage	Frequency	Percentage	
Age (In years)					
21-30	49	72.05%	45	66.17%	0.289
31-40	19	27.94%	23	33.82%	
Parity					
Primigravida	20	29.41%	16	23.52%	0.0370
Multigravida	48	70.58%	52	76.48%	
Gestational age					
36 weeks	05	7.35%	02	2.94%	1.044
37 weeks	10	14.70%	09	13.23%	
38 weeks	41	60.29%	47	69.11%	
39 weeks	12	17.64%	10	14.70%	

Table 2: Postoperative profile of study participants

Parameters	Group A (n=68)		Group B (n=68)		p-value
	Frequency	Percentage	Frequency	Percentage	
Re-catheterization due to urinary retention					
Absent	64	94.11%	68	100%	0.893
Present	04	5.89%	00	-	
Dysuria					
Present	04	5.89%	06	8.82%	1.240
Absent	64	94.11%	62	91.18%	
Burning micturition					
Present	03	4.41%	14	20.58%	0.0167
Absent	65	95.59%	54	79.41%	
Urgency					
Present	01	1.48%	03	4.41%	0.0252
Absent	67	98.52%	65	95.59%	
Patient feedback with catheter					
Without discomfort	67	98.52%	37	54.41%	-
Mild discomfort	01	1.48%	22	32.35%	
Significant discomfort	-		09	13.23%	

Table 3: Post-operative profile of study participants

Parameters	Group A	Group B	p-value
	Mean ± SD	Mean ± SD	
1st voiding time	3.98 ± 0.67	10.62 ± 2.18	0.001
Ambulation	8 ± 2	18 ± 3	0.0156
Duration of hospital stay	4.1 ± 0.84	5.6 ± 1.28	0.004

The leukocyte positive was observed in 13.23% of cases in group A and 20.58% of cases in group B, which was statistically significant ($p<0.05$).

Discussion

Majority cases were between age group 21-30 years in both groups (72.05% in group A & 66.17% in group B). Women with more than one pregnancy (70.58% & 76.48%) were common in both groups than primi (29.41% & 23.52%). Majority cases had 38 weeks of gestation 60.29% and 69.11%, followed by 39 weeks in 17.64% & 14.70% in group A and group B respectively (Table 1).

Re-catheterization was done in 5.89% of cases in group A, whereas none of the cases in group B had re-catheterization. Dysuria was observed in 5.89% cases in group A and 8.82% cases in group B. Burning micturition was seen in 4.41% of cases in group A and 20.58% of cases in group B. The difference of re-catheterization, and dysuria was statistically not significant ($p>0.05$), while burning micturition was statistically significant ($p=0.0167$).

The patient feedback on catheterization exhibited mild discomfort in 1.48% in group A and 32.35% in group B, significant discomfort was observed in 13.23% cases in group B only. 98.52% of parturients belong group A reported no discomfort that was higher than group B (54.41%) (Table 2). The first voiding time of urine was 3.98 in group A and 10.2 in group B. Ambulation time was 8 in group A and 18 in group b. The duration of hospital stay was 4.1 days in group A and 5.6 days in group B. The mean difference of first voiding time, ambulation and duration of hospital stay was statistically significant ($p<0.05$) (Table 3).

Burak ERSAK et al. divided 216 pregnant women into three groups according to the timing of catheter removal following a caesarean section: 6 hours, 12 hours, and 24 hours. The researchers found that 13.9% of the women whose catheters were withdrawn 6 hours after the procedure had urine retention. The group whose catheters were withdrawn after 24 hours had a much greater incidence of dysuria and infections. The duration of hospitalisation, however, was comparable across all three categories [9]. In a research conducted by El-Mazny A et al., 300 women who had elective caesarean sections were randomly assigned to one of two groups: group A, which had their catheters withdrawn immediately after the surgery, and group B, which had their catheters removed 12 hours later. Research indicated that compared to group B, group A had a much lower incidence of postoperative bacteriuria, dysuria, burning during micturition, urine frequency and urgency, mean postoperative ambulation time, first voiding time, and length of hospital stay. However, when it came to the frequency of urine retention needing recatheterization, there was no discernible difference [10]. In a research conducted by Basbug A et al., 134 women were randomly separated into two groups. One group had their catheters removed 2 hours after the caesarean section, while the other group had their catheters removed 12 hours later.

The study found that the 2 hour group had considerably lower urine frequency, shorter hospital stays, and shorter postoperative mobilisation times compared to the 12 hour group. However, there was no significant difference in terms of bacteriuria, urinary retention, dysuria, or first postoperative voiding time [12]. In a study conducted by Benedict TA et al., 140 women were randomly assigned to either a 12-hour or 24-hour catheter removal group. The researchers found that 31.8% of the women in group B experienced catheter-associated bacteriuria, while 16.2% of the women in group A experienced it. The first ambulation time was 24.8 hours for group B, while it was 20.9 for group A. Treatment costs, length of hospital stay, and frequency of urine retention did not vary substantially ($p>0.05$) among groups [13].

Patients who were extubated 6 hours, 12 hours, and 24 hours after surgery had a much lower urine retention rate than those who were extubated immediately after surgery, according to a systematic review and meta-analysis by Liao X et al. Six hours after a caesarean delivery is the sweet spot for removing the urinary catheter, albeit [14]. Dasgupta S et al. discovered that there was a statistically significant difference ($p<0.05$) between the study groups for bacteriuria, dysuria, urine frequency and urgency, postoperative ambulation time, and length of hospital stay, however there was no significant difference ($p>0.05$) regarding urinary retention. In a study conducted by El-Mazny Ae et al., 300 women were randomly assigned to two groups: one that had their catheters removed immediately after surgery (group A) and another that had them removed 12 hours later (group B).

The group that had their catheters removed immediately had a significantly lower incidence of bacteriuria, dysuria, burning during micturition, urinary frequency, urgency, mean postoperative ambulation time, duration of hospital stay, and first

voiding time [16]. The removal of the urine catheter should be done no later than six hours after the operation, rather than immediately after or more than six hours after, according to research by Huang Hui MS et al. [17]. The current study's results corroborated those of the aforementioned research, which found that patients whose catheters were removed immediately after surgery fared better than those whose removal was postponed. A bigger sample size with a multicentric approach is necessary for further investigation.

Conclusion

The results of present study were concluded that the complication including dysuria, urinary frequency, urinary urgency, burning micturition and incidence of UTI were comparatively low in immediate catheter removed group than delayed group. Therefore, immediate removal of catheter after elective caesarean section is associated with lower risk of urinary infection and earlier postoperative ambulation than the delayed removal.

References

1. Arulkumaran S, Cheng S, Ingemarsson I, et al. Is there a need for routine indwelling catheter after caesarean section? Singapore Med J 1986; 27(1):54-7.
2. Cunningham FG, MacDonald PC, Gant NF. Williams Obstetrics. 22nd edn. New York: McGraw-Hill Publication 2005.
3. Saint S, Wiese J, Amory JK, et al. Are physicians aware of which of their patients have indwelling urinary catheters? Am J Med 2000;109(6):476-80
4. Basbug A, Yuksel A and Ellibeş Kaya A. Early versus delayed removal of indwelling catheters in patients after elective cesarean section: a prospective randomized trial. J Matern Fetal Neonatal Med 2018; 33(1): 68-72
5. Kim B, Pai H, Choi WS, Kim Y, Kweon KT and Kim HA. Current status of indwelling urinary catheter utilization and catheter-associated urinary tract infection throughout hospital wards in Korea: A multicenter prospective observational study. PLos One 2017; 12(10):1-11.
6. El-Mazny A, El-Sharkawy M and Hassan A. A prospective randomized clinical trial comparing immediate versus delayed removal of urinary catheter following elective cesarean section. Eur J Obstet Gynecol Reprod Biol 2014; 181:111-114.
7. Divya P, Sumita M, Anshul G and Neerja G. Indwelling catheterization in caesarean section: time to retire it. Int J Clin Diagn Res 2015; 9(9): QC01–QC04.
8. Oliver CE, Chidinma VG, David AO and Olufunto OK. Prevalence and risk factors of asymptomatic bacteriuria among pregnant Nigerian infected with HIV. J Matern Fetal Neonatal Med 2012; 26(4):402- 406.
9. Adogwa, O., Elsamadicy, A. A., Fialkoff, J., Cheng, J., Karikari, I. O., & Bagley, C. (2017). Early ambulation decreases length of hospital stay, perioperative complications and improves functional outcomes in elderly patients undergoing surgery for correction of adult degenerative scoliosis. Spine, 42(18), 1420–1425.
10. Burak ERSAK, Duygu TUĞRUL ERSAK, Burak ELMAS, Bergen LALELİ KOÇ, Mahmut Kuntay KOKANALI, The Effect of Urinary Catheter Removal Timing On Urinary Retention In Caesarean Section, 2022;6(3):70-78.
11. El-Mazny A, El-Sharkawy M, Hassan A. A prospective randomized clinical trial comparing immediate versus delayed removal of urinary catheter following elective cesarean section. Eur J Obstet Gynecol Reprod Biol. 2014; 181:111-114.
12. Basbug A, Yuksel A, Ellibeş Kaya A. Early versus delayed removal of indwelling catheters in patients after elective cesarean section: a prospective randomized trial. J Matern Fetal Neonatal Med. 2020; 33(1):68-72.
13. Benedict TA, Olusola PA, Jacob OA, Adeyemi SA, Babatunde O. A randomized controlled trial of 12 hours versus 24 hours urinary catheter removal following uncomplicated caesarean section in Ekiti State, Nigeria. African Journal of Reproductive Health. 2023; 27 (6s):44-50.
14. Liao X, Xie L. A systematic review and meta-analysis of the timing of indwelling catheter extubation in patients undergoing gynecological and obstetric surgery. Ann Palliat Med 2021; 10(12):12519-528.
15. Dasgupta S, Ghosh C, Biswas J, Ghanti A, Majumder K. Study on removal of urethral catheter immediately versus after 12 hours following caesarean section- a prospective randomized controlled trial. J. Evolution Med. Dent. Sci. 2019; 8(40):2996-3000.
16. El-Mazny A, El-Sharkawy M, Hassan A. A prospective randomized clinical trial comparing immediate versus delayed removal of urinary catheter following elective cesarean section. Eur J Obstet Gynecol Reprod Biol. 2014; 181:111-114.
17. Huang Hui MS, Dong Li MS, Gu Lan BM. The timing of urinary catheter removal after gynecologic surgery: A meta-analysis of randomized controlled trials. Medicine 2020; 99(2): e18710.