Timing of Catheter Removal Post-Cesarean Section: A Systematic Review

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Background

Urinary catheterization is the leading cause of hospital-acquired urinary tract infections (UTIs) (Buchholz, Daly-Grandeau, & Huber-Buchholz, 1994). Normal practice is to leave an indwelling catheter in place for 12-24 hours following Cesarean Section. Concern regarding earlier removal of the catheter is related to potential urinary retention following regional anesthesia used for most Cesarean Sections. As a result of changes in the Center for Medicare Services (CMS) reimbursement guidelines, hospitals will no longer be reimbursed for diagnosis, treatment, or complications associated with catheter-acquired UTIs (CMS, 2008). Nurses caring for this patient population are in a position to impact outcomes related to the utilization and management of urinary catheters.

Methods

- Searched OVID Medline, CINAHL, and Essential Evidence Plus using a combination of the following terms: Cesarean Section, spinal anesthesia, urinary retention, UTIs, and urinary catheterization.
- Considered only studies involving women ages 19 to 44 years undergoing Cesarean Section or other gynecologic surgeries as primary procedure.
- Considered studies where women were not catheterized or received indwelling or intermittent urethral catheterization. Suprapubic catheterization was not considered.
- Utilized the following primary outcome criteria: incidence of UTI, urinary retention or both.
- Utilized the following inclusion criteria: RCTs, NRCTs, Systematic Reviews, Prospective/Retrospective Quasi-Experimental Studies and Descriptive Studies. Individual Case Studies were not considered.

Findings

- Overall, shorter duration of indwelling catheter is associated with a decreased incidence of UTI.
- Multiple RCTs, each involving between 160 and 200 patients undergoing either Cesarean Section or other gynecologic surgery, demonstrate a significant decrease in UTI incidence with shorter time of indwelling catheter placement (Ghoreishi, Jackson, Wilson, Maplithorpe, & Hammond, 1997; Kamiya, Seait, Muhrenter, Bhattacharyya, & Hazra, 2010; Liang, Lee, Chang, Wang, & Soong, 2009).
- One RCT studying 134 women having vaginal prolapse surgery demonstrated a trend toward a higher, but not statistically significant, incidence of UTI two weeks post-operatively when catheter was removed in 24 vs. 3 hours after surgery (Glavind, K., Monop, Madsen, & Glavind, J., 2007).
- One RCT involving 200 women undergoing scheduled, elective Cesarean Section found no statistically significant difference in UTI incidence between women whose catheter was removed immediately after surgery and whose catheter remained in place for 24 hours (Onile, K., Olaj, & Ogumiriri, 2008).
- A descriptive, cross sectional study of 1438 women determined the incidence of UTI is directly correlated with duration of catheterization (Buchholz, Daly-Grandeau, & Huber-Buchholz, 1994).

- Urinary retention is a potential complication of early catheter removal following Cesarean Section.
- While the risk is relatively small in most cases, it must be considered in decisions regarding when to remove an indwelling catheter after Cesarean Section. The risk ranges from 3.38% following removal of indwelling catheter in one descriptive study of 207 Cesarean Section patients (Chai, Wong, Mak, Cheon, Yp, & Wong, 2008) to 6.0% in a quasi-experimental study of 188 patients in which 133 patients had the catheter removed immediately after Cesarean Section (Anurukhaman, Chang, Ingramsson, Low, & Rahnam, 1996).
- In one prospective cohort study looking at 44 women undergoing Cesarean Section with regional anesthesia, when volume of urine in the bladder was measured at the time of first sensation to void, the median volume present was 152.4 ml. The authors note even one episode of over-distention of the bladder can cause significant and possibly permanent injury, making this a problem of significance should it occur (Foon, Troo-Heslot, Minns, & Kirk, 2010).
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- Several studies indicate potential benefits for patients when no indwelling catheter is used either during or immediately following Cesarean Section.
- Ghoreishi’s RCT of 270 patients found that time to ambulation when no catheter was used was approximately half that of when an indwelling catheter was used for 12 hours following surgery. The study also found that hospital length of stay was shorter by about 18 hours when no catheter was used.
- A large RCT comparing women in whom no catheter is used for Cesarean Section with those in whom catheter is removed 12 hours after surgery found that the incidence of UTIs was significantly lower in the no catheter group, as was mean time to ambulation (Nair, Ellergave, Abdam Profitfind, Al-Khalaidi, Al-Inary, & Sayed, 2009). Additionally, hospital length of stay was significantly shorter in the non-catheterized group.
- One RCT of 200 women in which the catheter was removed immediately following Cesarean Section versus 24 hours after surgery found no statistically significant difference in mean post-operative ambulation time or mean length of hospital stay (Onile, K., Olaj, & Ogumiriri, 2008).

Recommendations

- Remove the indwelling catheter <12 hours following uncomplicated Cesarean Section in order to minimize the risk of UTI (B)
- Develop and implement guidelines for bladder management following early catheter removal to promote timely identification and management of urinary retention (B)
- More high-quality research is needed to study the most appropriate timing and criteria for early removal of catheter following Cesarean Section performed under regional anesthesia (B).