Systematic Bladder Scanning Identifies More Women with Postpartum Urinary Retention than Diagnosis by Clinical Signs and Symptoms

Marie Blomstrand MSc Midwife, Region Jönköping County
Roland Boij MD, Region Jönköping County
Lennart Christensson RN PhD, Department of Nursing, Jönköping University,
Peter Blomstrand MD PhD, Region Jönköping County and Jönköping University

Departments of Obstetrics and Gynecology & Clinical Physiology
Background

• Incidence of postpartum urinary retention (PUR) 0.5-45 %
• Overt PUR = inability to void within 3-6 h
• Covert PUR = asymptomatic residual volume ≥ 150 ml

• Pathophysiology of PUR
  – Bladder muscle lose tone during pregnancy
  – Bladder capacity increase ≈ 1000 ml
  – Damages during labor, lacerations, peri-urethral oedema
  – Instrument-assisted birth
  – Regional analgesia or EDA

• Long-term consequences are unknown
  – Recurrent infections, incontinence, intermittent catheterization
  Mulder et al. Int Urogynecol 2014;25(12):1605-12
PUR is difficult to diagnose

- Abdominal palpation is difficult
- Symptoms are unspecific
  - abnormal bleeding, abdominal pain, feeling of incomplete bladder emptying, weak urine beam, urinary incontinence, and urinary infection
- Catheterization is an accurate diagnostic and therapeutic method but can lead to infection
- Ultrasound scanning is non-invasive but may be inaccurate. Blood in the uterus may be mistaken for urine in the bladder.
- The use of a bladder scan routine for identification of PUR is controversial

Aim

The aim of this study was to determine if systematic use of bladder scan accurately identifies more women with PUR than diagnosis by clinical signs and symptoms alone.
Patient enrolment

• 126 women were included to (I) an experimental group
  – systematic bladder scanning and catheterization according to a new regimen for prevention of urinary retention and bladder damage
• 126 women, matched by parity and age (± two years), were included to (II) a control group
  – catheterized when they were unable to void spontaneously within three hours after delivery or had clinical signs or symptoms of PUR
Experimental group

• Void within three hours after delivery.
• Bladder volume ≥ 400 ml after micturition, was the threshold for catheterization and definition of PUR.
• The measurement was performed at least twice, and the highest volume was reported.
• Post-void bladder volume ≥ 400 ml, clean intermittent catheterization was performed, urine volume measured.
  – urine volume > 1000 ml, an indwelling urinary catheter (IUC) was inserted.
  – urine volume ≤ 1000 ml, bladder scanning was performed within four hours of new voiding.
• The measurements were terminated when two consecutive bladder scan assessments showed PVRBV < 200 ml.
Results

• 21 women in the experimental group were identified with PUR. 10 with open PUR and 11 with covert PUR. The latter group had a PVRBV of 400 – 1200 ml.

• 9 women in the control group were identified with PUR (p < 0.05).

• No woman who gave birth by Caesarean section developed PUR.

• The odds of being identified with PUR among women with vaginal delivery in the experimental group was 1/4 compared to 1/11 in the control group giving an effect size of 2.7.

First week – chaos, angry staff, weeping women, why do you only care about my bladder and not my child or breastfeeding?
Risk indicators for post-void residual bladder volume ≥ 400 ml verified by catheterization in women with vaginal delivery in the experimental group

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Univariable analyses</th>
<th>Multivariable analyses</th>
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<tbody>
<tr>
<td>First pregnancy (n = 41)</td>
<td>4.4 [1.6 to 12.1]</td>
<td>2.4 [0.8 to 7.5]</td>
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<tr>
<td>Delivery with use of ventouse (n = 12)</td>
<td>5.3 [1.5 to 18.8]</td>
<td>2.4 [0.8 to 7.5]</td>
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<tr>
<td>Oxytocin infusion (n = 36)</td>
<td>7.7 [2.7 to 22.5]</td>
<td>6.6 [2.2 to 19.8]</td>
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<tr>
<td>Epidural analgesia (n = 34)</td>
<td>5.0 [1.8 to 13.8]</td>
<td>3.3 [1.1 to 10.0]</td>
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<tr>
<td>Second stage of labour &gt; 120 min (n = 21)</td>
<td>4.6 [1.6 to 13.3]</td>
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<tr>
<td>Active pushing &gt; 30 min (n = 18)</td>
<td>3.4 [1.1 to 10.3]</td>
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<td>Perineal tear 2(^{rd}) – 4(^{th}) and episiotomy (n = 25)</td>
<td>4.3 [1.5 to 12.0]</td>
<td>3.3 [1.1 to 10.0]</td>
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Bladder scan vs. catheterization

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Conclusions

- Oxytocin infusion and perineal tears are strong risk indicators for PUR in women with vaginal delivery.
- The odds of identifying women with PUR are 2.7 times higher by use of bladder scan than by use of clinical signs and symptoms.
- We suggest a regimen based on bladder scanning, in women with vaginal delivery and risk indicators, to select those who need support to void or catheterization.
- Further studies are needed to test the design and efficiency of such a regimen and the long-time consequence of PUR.
- It is important to train midwives and nurses in how to perform bladder scanning.