

Urinary catheterisation in labour

Care of the bladder in labour is essential to supporting the physiological process of labour. A full bladder can often be palpated above the brim of the pelvis, may hinder descent of the presenting part of the baby and potentially prolong the length of the labour as a result. Recommendations include frequency of passing urine for women on admission, throughout labour and in the third stage (National Institute for Health and Care Excellence (NICE), 2014a). Adequate bladder care can reduce the incidence of bladder over-distension and enable prompt recognition and appropriate management of women who have voiding dysfunction.

Mobilisation

The importance of mobilisation during labour was explored by Weiniger et al (2009). The post-void residual volume during this trial was measured by trans-abdominal ultrasound and was found to be higher among the labouring women who received epidural analgesia than those who received no or alternative analgesia. Fewer of the women who managed to walk to the toilet required urinary bladder catheterisation during the labour than women who used the bedpan. However, low-risk women who were randomised to walk to the bathroom with epidural analgesia and were able to do so during labour had a significantly reduced post-void residual volume, and a reduced requirement for urinary catheterisation (Weiniger et al, 2009).

The findings of this study challenge the misconception that an epidural and the use of a urinary catheter go hand-in-hand and supports practitioners to offer a less invasive procedure while still obtaining clinically viable information. However, it was also clear from both the findings of this study and from clinical practice that the more dense the epidural block, the greater effect on the ability to void urine. The significance of reduced mobility in labour is echoed by Millet et al (2012: 316):

'Catheter-associated bacteriuria during labour could be eradicated or reduced by the use of the walking epidural, which allows patients to ambulate to the bathroom and void independently.'

Regional anaesthesia and bladder sensation

Epidural and other forms of regional anaesthesia cause a disruption of the afferent input and

Abstract

This article aims to provide a brief overview of the use, indications and possible complications of urinary catheterisation in the intrapartum period. The inter-connected relationship between regional anaesthesia, mobility, infection and bladder function in labour and the immediate postpartum period are explored.

Keywords: Catheterisation, Intermittent catheterisation, Continuous catheterisation, Labour, Midwifery, Voiding difficulty

suppress the sensory stimuli from the bladder to the pontine micturition centre. This results in an inhibition of the reflex mechanism that normally induces micturition. Consequently, the contractile ability of the bladder can be reduced and the bladder may become over-distended (Lim, 2010). It is because of this increased sympathetic and motor blockade that urinary retention is a known side-effect of epidural analgesia (Millet et al, 2012).

A dense perineal block from epidural analgesia can increase the risk of urinary catheterisation in labour; however, the use of mobile epidurals using low-dose local anaesthetic in combination with opioids, preserve maternal mobility and may reduce the risk of bladder dysfunction. This statement was validated by the findings of Wilson et al (2009) where the addition of fentanyl to patient-controlled epidural analgesia did not increase the risk of urinary retention and more women who received mobile epidural techniques maintained the ability to void urine spontaneously at any time.

Relative to the high-dose block, mobile epidural techniques encouraged the retention of normal bladder function. They did not increase the risk of urinary catheterisation in labour when compared to the standard higher dose epidural regimens and resulted in a significant reduction of women receiving in-dwelling catheters with low dose epidurals. It is reasonable then to suggest that any regional anaesthetic carries with it a risk of urinary dysfunction relative to non-regional pain relief in labour.

If, however, catheterisation is required due to the presence of a dense regional anaesthetic or if the woman is unable to spontaneously pass urine during labour, this can be done by either clean intermittent catheterisation or the insertion of an indwelling catheter. During the active second

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Box 1. Urinary catheter care bundle

Insertion actions	Avoid catheterisation and consider alternatives, if possible
	Catheterisation is an aseptic procedure; therefore, clean the urethral meatus prior to insertion with sterile normal saline
	Use sterile lubricant or anaesthetic gel from a single use container to minimise urethral discomfort, trauma and the risk of infection
	Use sterile, closed drainage system
	Ensure proper hand hygiene
	Use single use items and discard immediately
	Ensure the catheter is secured comfortably
Ongoing care	Ensure proper hand hygiene
	Ensure catheter hygiene—clean site regularly
	Routine daily personal hygiene is all that is required for meatal cleansing
	Sampling—aseptically via catheter port
	Drainage bag position—above the floor and below the bladder
	Do not allow the urinary drainage bag to fill beyond three-quarters full
	Catheter manipulation
	Remove as soon as possible
From: Department of Health (2010); National Institute for Health and Care Excellence (2010); NICE (2014b); Loveday et al (2014)	

stage of labour, the catheter is deflated or removed in order to prevent the theoretical risk of bladder trauma (Kearney and Cutner, 2008).

Normal bladder sensation can be impaired for up to 8 hours following the last epidural top-up and during this stage, diuresis occurs making the postpartum bladder vulnerable to over-distension (Khullar and Cardozo, 1993). Asymptomatic over-distension of the bladder must be prevented because if postpartum voiding dysfunction is unrecognised, it can cause permanent damage to the detrusor muscle of the bladder and prolonged voiding dysfunction with sequelae such as recurrent urinary tract infections and incontinence. The effects of this can be potentially life-long (Dörflinger and Monga, 2001).

Urinary tract infection and catheterisation

Urinary tract infection (UTI) is the most common infection acquired as a result of health care (Loveday et al, 2014). The bladder is normally sterile; however, catheters can predispose it to infection as microorganisms may enter via the urethra and gain entry to the bladder. Microorganisms may be isolated from urine

after catheterisation and, in the absence of any symptoms of UTI; this is called ‘bacteriuria’.

The duration of catheterisation is deemed to be the dominant risk factor for catheter-associated UTI (Loveday et al, 2014; NICE, 2014b). Most microorganisms causing catheter-associated UTI (CAUTI) gain access to the urinary tract either ‘extra-luminally’ (as the catheter is inserted, by contamination of the catheter from health care workers’ hands, perineal flora or microorganisms ascending from the perineum) or ‘intra-luminally’ (by reflux of microorganisms from a contaminated urine drainage bag).

Intermittent vs continuous bladder catheterisation

Intermittent catheterisation occurs when a catheter is introduced to drain the bladder and then removed. Previous systematic reviews found that this method resulted in lower incidences of infection (Niel-Weise and Van de Broek, 2005). Intermittent bladder catheterisation has also been found to be associated with a shorter second-stage of labour and less use of regional anaesthesia, but the same frequency of postpartum urinary retention and UTI was seen with both catheterisation groups (Evron et al, 2008).

Urethral trauma as a result of an inflated urinary catheter balloon being dislodged can result in significant loss of urethral closure pressure resulting in stress urinary incontinence that is unresponsive to conservative management/treatment. Balloon-related urethral trauma can be avoided by educating health professionals about proper placement and confirmation of position of catheter (D’Cruz et al, 2009). Avoidance of urinary catheter use is the most effective way to avoid all harm associated with urinary catheters, i.e. trauma, pain and CAUTI (Leuck et al, 2012). However, if catheterisation is likely to be required more than twice during labour it may be reasonable to site an indwelling urethral catheter (Box 1). It is suggested that this is undertaken following assessment of alternative methods, discussion with the patient and the clinical indications for catheterisations documented (Loveday et al, 2014).

Bladder emptying should be documented for all women during labour and individual circumstances influencing urine output, including fluid load and oxytocin use, should be considered. Although there are no clear guidelines as to how frequently the bladder should be emptied, every 4 hours is a minimum standard. Long-term morbidity can result if voiding does not occur for long periods of time (Birch et al, 2009).

Box 2. Puerperal voiding dysfunction

Risk factors	Symptoms
Primigravida	Slow or intermittent urinary stream
Epidural for labour/birth irrespective of mode of birth	Urinary frequency
Prolonged labour especially prolonged second stage	Incomplete emptying
Caesarean section	Urinary incontinence
Instrumental birth	Small voided volumes
Perineal injury: haematoma, bruising, tear with inadequate analgesia, anal sphincter injury	Urgency
	Hesitancy
	Bladder pain or discomfort
	Straining to void
From: Dorflinger and Monga (2001); Ching-Chung et al (2002)	No sensation to void
	From: Kearney and Cutner (2008); Lim (2010)

Puerperal voiding dysfunction

Voiding difficulty and urinary retention is a common and recognised phenomenon in the puerperium (Kearney and Cutner, 2008; Lim, 2010). However, the return to normal bladder function is reliant on prompt recognition, diagnosis and appropriate management. There are a number of risk factors for the development of voiding dysfunction (Box 2), but any woman can develop postpartum voiding dysfunction regardless of the type of labour analgesia or mode of delivery. Acute urinary retention can be painless in the postpartum period, especially following epidural anaesthesia. Other symptoms that should alert the clinician to voiding dysfunction include contributing factors to postpartum urinary retention, such as elevated progesterone levels in pregnancy and the immediate postpartum period. This creates a reduction in smooth muscle tone and a dilated and hypotonic bladder.

Spontaneous bladder rupture is an infrequent occurrence and is usually associated with previous surgery or trauma; however, the pathogenesis usually involves bladder over-distension and thinning of the dome due to urine retention (Dueñas-García et al, 2008). Due to the non-specific nature of its presentation, a high index of suspicion is necessary for diagnosis. In particular, a history of urinary retention, sudden increase or decrease in pain or discomfort and small amounts of infected or blood stained urine indicate the possibility of a rupture.

Catheterisation for caesarean section

It is common practice for women undergoing a caesarean section to be catheterised as part of the preparations made before going to theatre

or in an emergency the catheterisation may take place in theatre. The alleged benefits of using catheters in this setting are that bladder drainage is maintained and that may improve visualisation during surgery and minimise bladder injury. A previous randomised prospective trial (Kerr-Wilson and McNally, 1986) compared the use of intermittent or continuous catheterisation before the procedure. Nearly half of the intermittent group required re-catheterisation whereas all patients with indwelling catheters voided spontaneously on their removal. There was no difference in the incidence of significant bacteriuria noted. In contrast, a recent randomised controlled trial found that the non-placement of indwelling urinary catheter during caesarean was more convenient to women with no increase in intraoperative complications, or urinary retention. Indwelling urinary placement in haemodynamically stable patients proved not to be beneficial in this study (Nasr et al, 2009). It is recommended that the woman's discomfort with the first postoperative void, time of ambulation, time of hospital stay, and need for re-catheterisation would all need to be considered and documented (Ghoreishi, 2003). These findings were further qualified by a recent study that compared immediate urinary catheter removal with removal at 12 hours post elective caesarean section. Immediate removal of urinary catheter after elective caesarean section was found to be associated with lower risk of urinary infection and earlier postoperative ambulation. The time until the first void and length of hospital stay were significantly shorter in the women who had immediate removal of the catheter compared with women who had the catheter removed after 12 hours (El-Mazny et al, 2014). A recent Cochrane review also explored this area and acknowledged

the emerging evidence that supports omitting the use of in-dwelling catheters peri- and post-elective caesarean section due to the reduced incidence of UTI, pain and discomfort, early ambulation and shorter hospital stay (Abdel-Aleem et al, 2014). However, the evidence remained insufficient with a need for more rigorous randomised controlled trials.

Conclusions

Intrapartum bladder care and the prevention and management of postpartum urinary retention are of great clinical importance. The prevention of acute bladder distension is far more beneficial than the treatment of cases once symptoms have developed. The implementation of regular screening protocols (Loveday et al, 2014) is advisable as cases recognised, diagnosed and treated promptly can prevent long-term, irreversible damage to the detrusor muscle that can have a permanent impact on a woman's quality of life.

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Key points

- Bladder care is an integral part of care in labour
- Bladder emptying should be documented for all women during labour
- Individual circumstances influencing urine output should be considered
- An aseptic technique can minimise the introduction of infection
- Adequate bladder care can reduce the incidence of bladder over-distension and enable prompt recognition of women who have voiding dysfunction
- Documentation of all procedures involving the catheter or drainage system in the clinical notes
- Post-delivery bladder emptying must be documented
- The time and volume of the first void must be recorded
- Voiding should be encouraged every few hours in the immediate postpartum period and not left beyond 6 hours
- Normal sensation, difficulty initiating micturition, sensation of incomplete emptying, volume voided and timing and frequency of voids needs to be documented in the clinical records

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