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Management of postpartum urinary retention

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Abstract

There is a large body of literature investigating the mechanism, risk factors, and pathophysiology of postpartum urinary retention; it is usually a temporary condition where early diagnosis and appropriate management can avoid long term complication. This article reviews the etiology, prevention, management and long-term implications of retention for bladder functions.

Keywords: Postpartum urinary retention; Prevention; Management

1. Introduction

Postpartum urinary retention is regarded as a common event but the reported incidence varies considerably, from 1.7 to 17.9% [1,2]. Literature on this common condition is relatively exiguous.

In the women voiding difficulties and retention represent a gradation of failure of bladder emptying. These disorders are poorly documented mainly because they are frequently misdiagnosed until symptoms such as recurrent urinary tract infections or incontinence prevail. Since the condition rarely progress to upper tract dilatation and renal failure, they are not associated with mortalitiy, but its morbidity is significant.

2. Definitions and classification

Although there is no standard definition textbooks define postpartum urinary retention as the sudden onset of painful or painless inability to void over 12 h, requiring catheterization with removal of a volume equal to, or greater than the bladder capacity [3]. Another definition of postpartum urinary retention is ''the absence of spontaneous micturition within 6 h of vaginal delivery.'' After cesarean delivery, if a catheter is used, retention is defined as ''no spontaneous micturition within 6 h after the removal of an indwelling catheter (more than 24 h after delivery) [4].'' The International Continence Society revised definition of acute urinary retention as painful, palpable or percussable bladder, when the patient is unable to pass any urine [5]. In postpartum circumstances pain may not be a presenting feature, for example, after regional anesthesia.

Postpartum urinary retention has been classified into covert and overt forms by some investigators [6]. The covert form can be identified by elevated post-void residual measurements, either with ultrasound scanning or with catheterization. Women with post-void residual volumes of $\geq$150 ml and no symptoms of urinary retention are in this category. Clinically overt postpartum urinary retention refers to the inability to void spontaneously after delivery.

The incidence of postpartum urinary retention depends on the definition used as well as differences in obstetric practice. Using the definition of no spontaneous void within 6 h of delivery, retrospective analysis of medical records showed the incidence of clinically overt type of urinary retention to be as low as 0.14% [7]. Where protocols and clinical guidelines are followed for diagnosis and management the incidence of both overt and covert types of postpartum urinary retention was found to be 0.7% [8].

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3. Aetiology and pathophysiology

In females voiding occurs when there is initial relaxation of the urethral sphincter and pelvic floor musculature, followed by contraction of the detrusor muscle and, a rise in intrabdominal pressure. Voiding disorders result when one of these mechanisms fail. When the detrusor muscle is unable to maintain an effective contraction (detrusor hypotonia) and/or the urethra fails to relax and lower urethral resistance, voiding becomes restricted. Similarly voiding dysfunction also occurs if there is a failure in the synchronization of these two actions such that the detrusor contracts but the urethra fails to relax, known as detrusor sphincter dyssynergia [3]. Occasionally flow may be prevented altogether. Non-relaxing urethral obstruction can also occur, after radical pelvic surgery. As a consequence of voiding dysfunction and urinary retention, some patients can present with overflow urinary incontinence which may be mistaken for urinary stress incontinence unless a good clinical history and/or urodynamics studies are undertaken to distinguish between the two conditions [5].

Physiological and traumatic events during pregnancy and child birth such as damage to the nerves, pelvic muscles and bladder musculature increase the risks of urinary retention in the postpartum period [9].

Voiding difficulties following delivery have been recognized for a long time [10]. Further information regarding etiology and outcome, however, has been limited by the fact that urodynamic investigations are by and large invasive [11] and are not always available.

The pathophysiology of postpartum urinary retention is poorly understood. In pregnancy and few weeks after delivery, progesterone reduces smooth muscle tone, resulting in dilatation of renal pelvis, the ureter and the bladder [12]. Beginning in the third month of pregnancy the tone in the detrusor muscle decreases and the bladder capacity slowly increases. As a result pregnant women ordinarily have the first desire to void when the bladder contains 250–400 ml of urine and maximum urinary urge often is not reached until 800–1000 ml in the supine position. When a pregnant woman stands up the enlarged uterus exerts pressure on the bladder, this places an added burden on the bladder and therefore a doubling of bladder pressure has been observed in the 38th week [8]. This disappears once the baby is born, without the weight of pregnant uterus to limit its capacity; the postpartum bladder tends to be hypotonic.

4. Risk factors

General obstetric factors include nulliparity, prolonged first and second stages of labor, instrumental delivery, and cesarean sections for lack of progress in the first stage of labor [4,12,13]. Duration of labor has been found to be a very significant risk factor. In a recent study labor that exceeded 11 h and 40 min was found to have significant association with postpartum urinary retention [14].

The effect of epidural analgesia on the postpartum bladder is controversial. Weisman et al. [15] showed that regional analgesia is not associated with an increased risk for postpartum urinary retention after vaginal delivery while in a recent study by Rizvi et al. [7] epidural analgesia was found to be associated with retention of urine in 24% of their patients. Differences may be due to lower doses of anesthetic drugs used or changes in other obstetric practices.

5. Impact of retention on bladder functions

In the short term, retention of urine, if not identified and relieved, may lead to atony of bladder and infection. It is generally believed that the risk of harmful effects on urinary bladder starts at residual volumes between 500 and 800 ml [16]. Early detection of persistent urinary retention is very important as irreversible damage may result from bladder overdistension [17]. It has long been established that a single episode of bladder over-distention (if not diagnosed and treated early), may cause persistent postpartum urinary retention and irreversible damage to the detrusor muscle with recurrent urinary tract infections and permanent voiding difficulties [18].

In three large studies of women after delivery, all women with postpartum urinary retention returned to normal within 2–6 days of diagnosis [12,13,19]. However, although the problem resolved quickly, there are small case studies of women, who do not resume normal voiding for several weeks [2].

Yip et al. could not show a higher prevalence of stress incontinence, fecal incontinence, frequency, nocturia, urgency and urge incontinence in a 4-year follow-up study of women who were diagnosed to have postpartum urinary retention [20].

6. Prevention

Identifying risk factors, monitoring two hourly urinary output during labor and vigilant early detection of postpartum urinary retention are considered as the most important preventive measures. In women unable to void within 6 h of delivery, ultrasound evaluation or straight catheterization can identify women who need close surveillance. Early detection of postpartum urinary retention especially covert type is possible by measuring the urinary volume by ultrasound. The reliability of ultrasound measurement and estimation of post-void residual bladder volume has been validated in postpartum women by Yip et al. [21]. Ultrasound measured urinary volume of 99 women with postpartum urinary retention was compared with immediate collected catheterized volume. The results of the study have shown that ultrasonic assessment of post-void residual bladder volume in the postpartum period is