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Incidence and treatment of urinary retention postpartum

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Abstract The aim of this clinical study was to examine the incidence of postpartum urinary retention, to investigate the relationship between different obstetric parameters, and to find out whether our proposed treatment program fulfilled our needs. The incidence of urinary retention postpartum was 0.7%. The incidence of instrumental delivery, sphincter rupture, and larger lacerations of the perineum was significantly increased in the group with urinary retention. Our program for detecting and treating patients with postpartum urinary retention seemed to work efficiently.

Keywords Postpartum · Urinary retention

Abbreviations *CI* confidence interval · *CIC* clean intermittent catheterization

Introduction

Urinary retention postpartum is regarded as a common event but the reported incidence varies considerably, from 1.7% to 17.9% [1]. This is most likely due to inaccurate and varying definitions and differences in the diagnostic criteria and treatment modalities. The increased use of cesarean section for difficult or prolonged labor in modern obstetrics has probably lowered the incidence [2].

The pathophysiology of postpartum urinary retention is poorly understood. The elasticity of all urinary passages seems to be increased during pregnancy, owing partly to a hormonal reduction of smooth muscle tone. As early as 1938 Muellner proved that the capacity of the bladder increases during pregnancy [3]. Beginning in the third month of pregnancy the muscles of the bladder lose tone and its 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 1000–12000 ml in the supine position. When the 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, indicating a reduction in bladder capacity at that time; this disappears once the baby has been born. Without the weight of the pregnant uterus to limit its capacity the postpartum bladder tends to be hypotonic. These changes persist for days to weeks [1, 4].

Traumatic events such as damage to nerves, pelvic muscles and bladder musculature during childbirth increase the risk of urinary retention in the postpartum period. This risk is assumed to be greater in connection with instrumental delivery, first vaginal delivery, birth canal and perineal trauma, and protracted deliveries. The effect of epidural analgesia on the postpartum bladder is controversial [5, 6].

The aim of this study was to find the incidence of urinary retention in our department, to investigate the relationship between different obstetric parameters and urinary retention, and to find out whether our proposed investigation and treatment program worked optimally.

Methods

During a 6-month period all patients who gave birth in our department and had urinary retention were treated according to a new protocol and registration.

What comprises an abnormal amount of residual urine in the early puerperium has yet to be defined. We defined suspicion of urinary retention as the absence of spontaneous micturition within 6 hours of vaginal delivery, or 6 hours after the removal of an indwelling catheter in the case of cesarean section.

The nurses or midwife in the department asked patients whether spontaneous micturition had occurred after 6 hours. If this was not the case patients were primarily treated by “helping measures” such as oral analgesia, if they were in pain, and assisting them into a warm bath. If the patients were still unable to urinate an ultrasound

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scan was performed. If the bladder volume was more than 400 ml catheterization was performed. In patients with volumes less than 400 ml spontaneous voiding was awaited and a new scan was performed approximately 1 hour later. Catheterization was repeated every 4–5 hours during the daytime if the patient was unable to void or the postvoid residual volume was more than 100 ml on ultrasound assessment. If after 48 hours the patient was still unable to void, or had postvoid residual urine of more than 100 ml, an incontinence nurse instructed them in intermittent catheterization.

Fisher's test ($p < 0.001$) was performed to see if there was statistically significant difference between the group of patients with urinary retention postpartum and those without, as regards different obstetric parameters.

Results

During the period 1 December 2000 to 1 June 2001 1649 women gave birth in our department. Twelve of them (0.7%) (95% confidence intervals (CI) 0.4–1.2%) experienced postpartum urinary retention according to our definition.

Two patients (16%) had babies that were heavy for dates, compared to 263 (15%) in the total population of women giving birth.

Instrumental delivery was performed in 33% of patients with urinary retention, compared to 8% in the total population of women giving birth ($p = 0.0082$). Episiotomy was performed in 17%, compared to 7% in the total population ($p = 0.149$), sphincter rupture was observed in 33% compared to 1% ($p = < 0.001$), and large lacerations of the perineum (defined as ruptures in the perineum down to or involving the sphincter) in 42%, compared to 4% ($p = < 0.001$). Epidural analgesia was used in 33% compared to 11% ($p = 0.0196$), and cesarean section in 17% compared to 16%. There was thus a statistically significant difference between the incidence of instrumental delivery, sphincter rupture, and large lacerations of the perineum in patients with urinary retention postpartum and the group without (Table 1).

The largest measured volume of residual urine was a median of 703 ml (80–1500). The patient with only 80 ml in the bladder had urinary urge and the scan had wrongly shown a larger volume. In 7 patients catheterization was performed for only 1 day, in 5 for 2 days, and only 3 patients were instructed on how to perform self-catheterization after 48 hours. During the first 48 hours catheterization was performed a mean of 4.25 times (1–9). Three patients performed self-catheterization at home for 7, 15 and 21 days. Urinary infection was observed in 2 patients, both in the group of 3 who continued treatment at home.

The three patients who were treated at home had a normal urinary flow and no residual urine (measured with a bladder scanner) at the end of treatment.

Discussion

The incidence of urinary retention in our department was low (0.7%). Burkhart et al., in 1965, studied 1000

postpartum women and reported that 4.9% required at least one catheterization during the postpartum period. Only patients complaining of discomfort and the urge to void with inability to do so were treated [7].

Yip et al. [8] also found the incidence of overt retention postpartum to be 4.9%. They investigated 691 women with vaginal delivery on postpartum day 1. The patients were divided into three groups: (1) overt urinary retention with urgency and stranguria (34 patients, 4.9%), (2) covert urinary retention with a residual urine more than 150 ml (67 patients, 9.7%), and (3) normal patients (590, 85.3%). The volume of 150 ml was arbitrarily chosen as normal. It is unclear whether groups 1 and 2 represent two genuinely distinct groups with separate pathophysiologies or a spectrum of the same disease. Covert urinary retention is a self-limiting phenomenon. In all patients with covert retention their postvoid residual returned to normal within 4 days. More instrumental deliveries, epidural analgesias and episiotomies were found in groups 1 and 2, which is in agreement with our findings concerning the instrumental deliveries. There was no difference in the incidence of birth canal trauma between the three groups, which is in contrast to our study, which found a higher incidence of larger lacerations and sphincter rupture in the group with urinary retention.

In our patients the longest period of clean intermittent catheterization (CIC) was 21 days. There are only sparse data as to how long CIC is needed after birth. Cases of up to 6 weeks are reported, but in most patients CIC is only performed for a few weeks [9, 10].

In one of our patients a volume of more than 400 ml was observed on the bladder scan, even though the measured volume was only 80 ml. Previous studies have shown a close correlation between the measured and observed volumes. There are, however, a few isolated cases where the actual volume differs considerably from the scan volume, and this is potentially because the uterine cavity, which may be filled with fluid and blood, is measured instead [11].

We did not use prophylactic antibiotics in our patients. Two patients had urinary tract infection. Some authors recommend antibiotics if the bladder contains more than 700 ml [1]. This was, however, not the case in one of our patients with urinary tract infection.

It is well known that in a non-pregnant population a single episode of overdistension can produce chronic changes in the detrusor muscle, and that residual urine has the potential to cause urinary tract infection. We do not know what the clinical implications of these phenomena are in the early puerperium.

Our protocol seems to find the right patients who need to perform CIC at home. However, we still do not know what the long-term sequelae might have been had CIC not been instituted. It is important to have a precise instruction in every department. Furthermore, it is important to instruct doctors and nurses in how to perform a bladder scan in order to avoid unnecessary catheterizations.

A proper randomized controlled trial with systematic long-term follow-up of women who have postpartum urinary retention is necessary to determine whether catheterization prevents urinary voiding and continence problems.

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Editorial comment

This study points out the interesting association between postoperative urinary retention and certain obstetric factors (instrumented delivery, sphincter ruptures). This drives home the clinically relevant point that women with more perineal trauma deserve closer assessment for postpartum retention. It remains to be seen whether their surveillance/detection method will be the most efficient. Having heightened awareness of the problem, perhaps these investigators could compare a variety of methods to determine the optimal methods for detection of postpartum urinary retention.