Research Article

Postpartum Urinary Retention after Vaginal Delivery

Retensi Urin pada Pasien Pascasalin Pervaginam

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Abstract

Objective : To determine the incidence of postpartum urinary retention (PUR) after vaginal delivery and to specify any obstetric risk factors of PUR.

Methods : Case-control study. Six hours after vaginal delivery, urethral catheterisation was implemented for estimation of post-void residual bladder and diagnosis PUR. Patient data, including age, gestational age, body mass index, parity, mode of delivery, labour duration, perineal laceration or episiotomy, and fetal birth weight, were compared between women with and those without PUR to determine which obstetric factors that develop PUR.

Results : Of the 365 participants recruited, 38 (10,67%) had PUR: 33 (9,27%) with covert PUR and 5 (1,4%) with overt PUR. Women with perineal laceration or episiotomy (p<0,05), instrument-assisted delivery (p<0,05), first stage duration of labor more than 12 hours (p<0,05), second stage duration of labor more than one hour in multipara (p=0,041), and fetal birth weight more than 3800 grams (p<0,05) more prone to develop PUR.

Conclusions : The incidence of PUR were associated with several obstetric risk factors: perineal laceration or episiotomy, instrument-assisted delivery, first stage duration of labour more than twelve hours, second stage duration of labour more than one hour in multipara, and fetal birth weight more than 3800 grams.

Keywords : postpartum urinary retention, risk factor, vaginal delivery.

Abstrak

Tujuan : *Mengetahui angka kejadian retensi urin di kota Manado dan mengetahui faktor risiko obstetri yang berperan dalam terjadinya retensi urin pascasalin pervaginam.*

Metode : *Penelitian kasus kontrol. Dilakukan pemeriksaan residu urine 6 jam pascasalin pervaginam untuk mengetahui kejadian retensi urine. Data pasien yang diambil berupa usia, usia gestasi, indeks massa tubuh, paritas, jenis persalinan, durasi kala I, durasi kala II, laserasi perineum / episiotomi, dan berat badan lahir bayi kemudian dibandingkan antara yang menderita retensi urin dan tanpa retensi urin pascasalin untuk mengetahui faktor risiko obstetri yang berperan.*

Hasil : *Dari 365 sampel penelitian, 38 (10,67%) menderita retensi urin: 33 (9,27%) retensi urin asimptomatis dan 5 (1,4%) retensi urin simptomatis. Pasien dengan laserasi perineum / episiotomi (p<0,05), persalinan dengan bantuan instrumen (p<0,05), durasi persalinan kala I ≥ 12 jam (p<0,05), persalinan kala II ≥ 1 jam pada multipara (p=0,041), dan berat badan lahir bayi ≥ 3800 gram (p<0,05) memiliki risiko lebih tingi menderita retensi urin pascasalin pervaginam.*

Kesimpulan : *Kejadian retensi urin pascasalin pervaginam berhubungan dengan beberapa faktor risiko obstetri yaitu laserasi perineum / episiotomi, persalinan dengan bantuan instrumen, durasi persalinan kala I ≥ 12 jam, persalinan kala II ≥ 1 jam pada multipara, dan berat badan lahir bayi ≥ 3800 gram.*

Kata kunci : *faktor risiko, persalinan pervaginam, retensi urin*

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INTRODUCTION

Postpartum urine retention (PUR) is a common puerperal condition and is defined as the inability to (completely) urinate after childbirth.[1]The recent study (adopting Yip et al)[2] classified PUR as overt (symptomatic) and covert (asymptomatic). PUR overt defined as the inability to urinate spontaneously within six hours after delivery and require catheterisation. PUR covert defined as a post-void residual volume (PVRV) volume of 150 ml after spontaneous micturition.[3,4]The estimated incidence of PUR varies widely from 1,7% to 17,9% because of different definitions and diagnostic criteria.[5,6]

The precise pathophysiology of PUR is still unknown. However, it is likely to be multifactorial, including physiological, neurological, and mechanical processes in the postpartum period. It

is almost impossible to predict which patients will develop PUR; all patients on the postpartum ward should be considered to be at high risk; however, studies have identified several independent risk factors. These risk factors include prolonged first and/or second stage of labour, birth weight >3800 grams, and primiparity.[7,8] Mulder et.al[1] studies show that instrument-assisted delivery, regional anaesthesia, episiotomy, and nulliparity are statistically significantly associated with a higher incidence of overt PUR.

PUR can cause complications such as persistent bladder distension, uremia, and sepsis which may lead to death.[9] Persistent urinary retention may also cause irreversible detrusor muscle damage as well as recurrent urinary tract infections.[10,11]

METHODS

This study was conducted by a case-control study. The study population consisted of women who delivered between November 2017 to February 2018 that meet the inclusion and exclusion criteria. The inclusion criteria are normal or instrument-assisted vaginal delivery. Six hours after vaginal delivery, all of the participants that have agreed to follow the research and signed informed consent will be asked about postpartum voiding complaints and the measurement of residual urine with catheterisation.

PUR was defined as a post void residual volume more than 150 ml without any complaints and was classified as asymptomatic PUR (covert). Women with voiding complaints such as urinary difficulties, urinary dissatisfaction, pain and tension in the bladder are classified as symptomatic PUR (overt).

All samples were taken and recorded data including age, gestational age, parity, body mass index, mode of delivery, perineal laceration or episiotomy, duration of labour, and birth weight. The data obtained were then tested statistically and compared between those women who had PUR and those who did not.

Statistical analysis was performed using SPSS version 22.0. Normally distributed data were tested by Kolmogorov-Smirnov and presented as mean ± standard deviation. Quantitative variables are presented with the number (percentage). Statistical comparison performs by chi-square test ($\chi 2$), Fischer exact test, and Mann-Whitney U. The p-value <0,05 was considered statistically significant.

RESULTS

Table 1. Incidence of Postpartum Urinary Retention

Postpartum urinary retention	Frequency	Cumulative %
Absent	318 (89.33)	89.33
Present : Covert	33 (9.27)	10.67
Overt	5 (1.4)	
Total	356 (100)	100

There were 356 samples meeting the inclusion criteria, 38 samples (10.67%) had PUR and 318 samples without PUR (table 1). Of 38 women with PUR: 33 cases (9.27%) had asymptomatic PUR (covert), and 5 cases (1.4%) had symptomatic PUR (overt).

The demographics of cases and controls are shown in Table 2. The mean age was 26.58 ± 5.93 years in women with urine retention, and 25.70 ± 6.09 in those without urinary retention; the difference was not significant (p=0.996).

The mean gestational age in women with PUR was 38.71 ± 1.16 years, and 38.26 ± 1.73 years in women without PUR (p = 0.095). Mean body mass index (BMI) in women with PUR 27.49 ± 3.54 compared with body mass index of women without PUR 25.37 ± 3.46; statistically significant (p<0.05) (table 2).

Table 2. Demographic of Cases and Controls

Characteristic	Cases (n=38)	Controls (n=318)	*P-value*
Age (years)	26.58 ± 5.93	25.70 ± 6.09	0.996
Gestation (weeks)	38.71 ± 1.16	38.26 ± 1.73	0.095
BMI (kg/m^2)	27.49 ± 3.54	25.37 ± 3.46	<0.05

Table 3. Risk Factors Affecting PUR

Risk Factors	PUR (n=38)	No PUR (n=318)	*P-value*
Parity			
Primiparous	16 (42.10)	132 (41.51)	0,944
Multiparous	22 (57.89)	186 (58.49)	
Mode of delivery			
Instrument-assisted	9 (23.68)	9 (2.83)	<0.05
Spontaneous	29 (76.31)	309 (97.17)	
Perineal laceration			
Yes	38 (100)	202 (63.52)	<0.05
No	0 (0)	116 (36.48)	
First stage of labor			
≥ 12 hours	16 (42.11)	21 (6.60)	<0.05
< 12 hours	22 (57.89)	297 (93.40)	
Second stage of labour			
Primiparous			
≥ 2 hours	1 (6.25)	1 (0.76)	0.205
< 2 hours	15 (93.75)	131 (99.24)	
Multiparous			
≥ 1 hour	3 (13.63)	5 (2,69)	0.041
< 1 hour	19 (86.37)	181 (97.31)	
Birth weight			
≥ 3800 grams	21 (55.26)	12 (3.77)	<0.05
< 3800 grams	17 (44.74)	306 (96.22)	

The association between obstetric risk factors with incidence of PUR was presented in Table 3. Sixteen cases (42.10%) of primiparous women who had PUR compared with 132 cases (41.51%) of primiparous women without PUR; parity was not associated with PUR (p=0.944). Instrument-assisted delivery (p<0.05), perineal laceration (p<0.05), prolonged 1st stage of labor (p<0.05), prolonged 2nd stage of labor at multipara (p=0.041), and birth weight >3800 grams (p<0.05) there was a significant relationship with incidence of PUR.

DISCUSSION

The purpose of this study was to determine the incidence of postpartum urinary retention (PUR) after vaginal delivery in Manado and to specify any obstetric risk factors that contribute to PUR. In this study, the incidence of PUR was 10.67% (38/356), consisting of 9.27% covert PUR and 1.4% overt PUR. In the literature, the incidence of PUR varies, this was most likely due to inaccurate and varying definitions and the difference in the diagnostic criteria and treatment modalities.[12-14]

In the literature, many different obstetric risk factors have been considered for the pathogenesis of PUR such as parity, prolonged labour duration, perineal laceration, instrument-assisted delivery, macrosomic baby, labour induction, fundal pressure, epidural analgesia; however, the exact etiology of PUR had not been clearly identified.[8]

The incidence of PUR had been found to be higher in primiparous than in multiparous. In primipara, the risk of postpartum urinary retention increases as the group was at risk of prolonged labour duration, instrument-assisted delivery, or perineal laceration.[15] In a recent study and present study, parity was not a risk factor for postpartum urinary retention.[8]

This study found a significant relationship between instrument-assisted delivery and incidence of urinary retention. In labor with instrument-assisted delivery may cause urinary neurological disorders due to trauma to the nerves around the pelvis, in addition to labor with instrument-assisted occurs mechanical outlet obstruction resulting in perineal edema or direct trauma to the bladder.[15,16]

We also found out that the incidence of PUR was higher in women with perineal laceration or episiotomy. Pain from repair of episiotomy and perineal laceration may cause urethral spasm reflex, then cause urinary retention.[6] In cases with perineal laceration or episiotomy, prevention of PUR by reducing perineal repair pain with adequate analgesia.[17]

Prolonged duration of labor and large baby birth weight was also a risk factor for PUR. In labor with a large baby or macrosomia was associated with prolonged labor. Prolonged labor was a risk factor of trauma to the pelvic floor muscle due to continuous stretching, otherwise it can cause damage to the pudendal nerve resulting in neurological damage to the micturition.[8,16] In the case of prolonged labor, prevention of urinary retention by catheterization.[17]

The conclusions of statistical test results in this study showed that the risk factors that significantly influence the occurrence of postpartum urinary retention were instrument-assisted delivery (p<0.05), perineal laceration or episiotomy ($\chi 2=20.56$; p<0.05), first stage duration of labor ($\chi 2=66.33$, p<0.05), second stage duration of labor (p<0.05) and birth weight > 3800 grams (p<0.05),

whereas parity had no significant relationship to the incidence of urinary retention. This result was in accordance with previous studies from Mulder et al.[1] and a recent study by Kekre et al.[18] who investigated the risk factors for postpartum urinary retention after vaginal delivery. PUR was a condition associated with labor, but this relationship was not fully investigated. An early undiagnosed and untreated postpartum urinary retention event may lead to persistent urinary retention, irreversible detrusor muscle damage, urinary tract infection, and permanent urinary difficulties.[12] In addition, the risk of uremia and sepsis, even spontaneous bladder rupture may occur. By identifying obstetric risk factors, urinary retention can be prevented in those at risk and can be given appropriate therapy.[9] Many studies suggest that risk factors for urinary retention are primigravida, prolonged duration of labor, instrument-assisted delivery, perineal laceration, and baby birth weight.[15,18-20] Nevertheless these risk factors affect each other and not stand alone so that when tested with strict control, then certain risk factors are more significant than others.[21] After vaginal delivery, there are changes in mucosal congestion, submucosal hemorrhage, especially in the trigonum region. If there was an acute overdistended-bladder then the bladder will experience hypoxic, followed by increased blood flow to the serosa of the bladder. Then there was compensation in the form of bladder hypertrophy. If it continues, there will be a decompensated stage in the form of decreased bladder function. Awareness of risk factors may allow the obstetrician to prevent this complication. [8,16,22,23]

CONCLUSION

The incidence of postpartum urinary retention after vaginal delivery in Manado was 10.67%, consisting of 9.27% covert PUR and 1.4% overt PUR. The statistical analysis showed risk factors that significantly affected the incidence of urinary retention after vaginal delivery were instrument-assisted delivery, perineal laceration or episiotomy, duration first stage duration of labour, second stage duration of labour, and birth weight> 3800 grams.

SUGGESTION

Examination of post-void residual volume 6 hours postpartum should be performed in patients with risk factors such as instrument-assisted delivery, prolonged labour, perineal laceration or episiotomy, baby birth weight>3800 grams. In patients with risk factors for the emergence of postpartum urinary retention can be done prevention such as adequate analgesics, antibiotics, or catheterisation.

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