

Research Article

Association of Obstetric Risk Factors with Postpartum Urine Retention in Spontaneous Labor

Hubungan Faktor Risiko Obstetrik dengan Retensio Urin Postpartum pada Persalinan Spontan

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Abstract

Objective: To determine the relationship between obstetric risk factors and the incidence of postpartum urinary retention in spontaneous labour at RSUD Ulin Banjarmasin.

Methods: This clinical study used an analytical observational design with a cross-sectional approach. The population of this study was patients with a diagnosis of postpartum urinary retention in spontaneous labour in the delivery ward and postpartum ward of Ulin Banjarmasin Hospital between January 2018-January 2020. The sample for this study was a part of the target population selected by purposive sampling, which fulfilled the inclusion and exclusion criteria. Data were analyzed using the Chi square test and multivariate analysis using binary logistics.

Result: The results showed 35 samples of patients diagnosed with postpartum urinary retention in spontaneous labour and had met the inclusion and exclusion criteria. Characteristic data of the study samples found that most of the study subjects were > 35 years old, 27 patients (77%), 21 patients (60%) of cases with primigravida parity, 26 patients (76%) with the duration of second stage labour ≥ 1 hour. Episiotomy was performed in 30 patients (86%), 34 patients (97%) had a newborn birthweight of <4000 grams. There was a significant association between the risk factors for parity in primigravida (p-value 0.02), second stage labour duration in primigravida (p-value 0.01), and episiotomy (p-value 0.01), with postpartum urinary retention in spontaneous labour. In contrast, age (p-value 0.19), and birthweight (p-value 0.10) were not significantly associated with postpartum urinary retention in spontaneous labour.

Conclusions: There were significant associations between obstetric risk factors (parity, duration of second stage labour, and episiotomy) with postpartum urinary retention in spontaneous labour. Whereas age and birth weight were not significantly associated with postpartum urinary retention in spontaneous labour.

Keywords: obstetric risk, postpartum retention, spontaneous delivery.

Abstrak

Tujuan: Mengetahui hubungan faktor risiko obstetrik dengan kejadian retensio urin postpartum pada persalinan spontan di RSUD Ulin Banjarmasin.

Metode: Penelitian ini merupakan penelitian klinis dengan rancangan observasional analitik dengan pendekatan potong lintang. Populasi dari penelitian ini adalah ibu postpartum yang didiagnosis dengan retensio urin postpartum pada persalinan spontan di kamar bersalin dan di ruangan nifas RSUD Ulin Banjarmasin periode Januari 2018-Agustus 2020. Data dianalisis bivariat menggunakan uji Chi square dan analisis multivariate dengan menggunakan binary logistik.

Hasil: Didapati 35 sampel yang didiagnosis retensio urin postpartum pada persalinan spontan dan memenuhi kriteria inklusi dan eksklusi. Data karakteristik sampel penelitian ditemukan usia terbanyak subyek penelitian berusia >35 tahun sebanyak 27 pasien (77,14%), kasus dengan paritas primigravida sebanyak 21 pasien (60%), lama kala dua primigravida >1 jam sebanyak 26 pasien (76%). Tindakan episiotomi sebanyak 30 pasien (86%), berat bayi lahir terbanyak pada berat <4.000 gram yaitu sebanyak 34 pasien (97%). Terdapat hubungan yang bermakna pada faktor risiko paritas pada primigravida dengan p value 0,02, lama kala dua dengan p value 0,01, dan tindakan episiotomi dengan p value 0.01 dengan kejadian retensio urin postpartum sedangkan didapatkan hasil yang tidak bermakna pada risiko obstetrik usia dengan p value 0.19 dan berat bayi lahir dengan p value 0.10 pada kejadian retensio urin postpartum.

Kesimpulan: Terdapat hubungan signifikan antara faktor risiko obstetrik (paritas, lama kala dua dan tindakan episiotomi) dengan retensio urin postpartum persalinan spontan. Sedangkan umur dan berat badan lahir tidak berhubungan dengan retensio urin postpartum pada persalinan spontan

Kata kunci: persalinan spontan, risiko obstetrik, retensio postpartum.

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INTRODUCTION

Postpartum urinary retention is a common phenomenon during the puerperium, with a varying prevalence between 1.5% and 45%.¹ Urinary retention is one of the post-surgical complications, either obstetric or gynecologic surgery. Postpartum urinary retention is defined as the absence of spontaneous voiding or the inability to spontaneously urinate that begins 6 hours after vaginal delivery, and no spontaneous voiding 6 hours after catheter removal in cesarean section delivery (24 hours after delivery).²

Postpartum urinary retention has a varying of clinical manifestations such as sudden pain along with the inability to spontaneously void the bladder in 24 hours after vaginal delivery, with a bigger urinary volume compared to bladder capacity and thus requiring catheterization.²

The incidence rate for postpartum urinary retention varies between 1.7% - 17.9% due to various definitions and study methods.³ The incidence rate for postpartum urinary retention is 4%.⁴

A prospective case-control study discovered that 8 (1.5%) of 530 women develop postpartum urinary retention after vaginal delivery.^{4,5} In Indonesia, the incidence rate for postpartum urinary retention is approximately 14.8%.⁶ Ulin Banjarmasin Hospital reported that there are 11 cases of postpartum urinary retention out of 2,850 deliveries in 2002-2003, 8 of these cases (81.8%) occurred in spontaneous vaginal delivery, 2 of cases (18.2%) in vacuum extraction, and 1 of cases (1%) in cesarean section.⁷

A study in Kandou Manado Hospital stated that postpartum urinary retention is associated with some obstetric risk factors such as perineal laceration or episiotomy, assisted vaginal delivery, duration of first stage labour >12 hours, duration of second stage labour >1 hour in multiparity, and birth weight of >3800 gram.⁸ The aim of this study was to analyze the association of obstetric risk factors, which are age, parity, duration of second stage labour, episiotomy, and birth weight, with the incidence of postpartum urinary retention in spontaneous labour in Ulin Banjarmasin Hospital, South Kalimantan Province in the period of January 2018 – January 2020.

METHODS

This clinical study used an analytical observational design with a cross-sectional approach. The population of this study was patients with a diagnosis of postpartum urinary retention in spontaneous labour in the delivery ward and postpartum ward of Ulin Banjarmasin Hospital.

This study's data were secondary data from the medical records of patients diagnosed with postpartum urinary retention in spontaneous labour in Ulin Banjarmasin Hospital in the period of January 2018 – January 2020. The sample for this study was part of the target population selected by purposive sampling, which fulfilled the inclusion and exclusion criteria. This study's inclusion criteria include patients diagnosed with postpartum urinary retention in spontaneous labour in Ulin Banjarmasin Hospital. In contrast, exclusion criteria include patients' data were not completely recorded, patient with assisted vaginal delivery (vacuum or forceps extraction), and cesarean section (SC).

The obtained data were analyzed by using SPSS software. We used bivariate analysis by the Chi-square test to find the OR, confidence interval (CI), and multivariate analysis using binary logistic. P-value of <0.05 indicated a significant result.

RESULTS

There were 35 patients diagnosed with postpartum urinary retention in spontaneous labour who had met inclusion and exclusion criteria. Characteristic data of the study samples showed that 27 patients (77%) were >35 years old, and 8 patients (23%) were <35 years old. Cases of primigravida were found in 21 patients (60%), multigravida in 14 patients (40%). Cases of second stage duration \geq 1 hour were found in 26 patients (76%) and <1 hour in 9 patients (24%). 30 patients (86%) underwent episiotomy, and 5 patients (15%) did not get an episiotomy. Newborn birthweight of <4,000 grams was found in 34 patients (97%) and >4,000 grams in 1 patient (3%).

Table 1. The Characteristics of Study Samples

Subject Characteristics	Frequency	(%)
Risk Factors		
Age (y o)		
>35	27	77
<35	8	23
Parity		
Primigravida	21	60
Multigravida	14	40
Duration of the second stage of labor in primigravida (hour)		
>1	26	76
<1	9	24
Episiotomy		
Yes	30	86
No	5	14
Birthweight of the newborn (gr)		
>4,000	1	3
<4,000	34	97

Table 2 showed that obstetric risk factors in postpartum urinary retention are parity, duration of second stage labour, episiotomy, and birthweight. This table showed that woman age >35 years old was at higher risk to develop postpartum urinary retention compared to <35 years old (OR = 3.11, 95% CI [0.24-1.13]). The most common risk factor was primigravida parity, which accounts for 5.2 times compared to multigravida (95% CI [0.58-1.05]). The second stage labour duration of ≥ 1 hour in primigravida was found to be more common than the second stage labour duration of <1 hour (OR = 0.93, 95% CI [0.80-1.04]). Episiotomy was more often performed with OR = 4.83, 95% CI (0.33-0.39), birth weight of fewer than 4000 grams was more commonly found than a birthweight of more than 4,000 grams (OR = 0.90, 95% CI [0.90-1.03]).

Table 2. Bivariate Analysis of the Association between Age, Parity, Duration of Labor, Episiotomy, and newborn's Birthweight towards Postpartum Urinary Retention

Study Variable	Yes	%	No	%	OR (95%CI)	P-value
Age (y o)						
>35	28	90.3	3	75	3.11 (0.24-1.13)	0.39
<35	3	9.7	1	25		
Parity						
Primigravida	26	92.9	5	71.4	5.2 (0.58-1.05)	0.02
Multigravida	2	7.1	2	28.6		
Duration of the second stage of labour in primigravida (hour)						
>1	28	87.5	3	100	0.93 (0.80-1.04)	0.00
<1	4	12.5	0	0.00		
Episiotomy						
Yes	29	90.6	2	66.7	4.83 (0.33-0.39)	0.01
No	3	9.4	1	33.3		
Newborn birthweight (gr)						
>4,000	0	0.00	30	11.8	0.96 (0.90-1.03)	0.11
<4,000	1	100	4	88.2		

Table 3. Multivariate Analysis of the Association between Age, Parity, Duration of Labour, Episiotomy, and Newborn Birthweight towards Urinary Retention

Subject Characteristics	OR (95%CI)	P-value
Age (y o)		
>35	1.20 (0.67-2.14)	0.19
<35		
Parity		
Primigravida	1.11 (0.42-0.63)	0.02
Multigravida		
Duration of the second stage of labour in primigravida (hour)		
> 1	0.93 (0.80-1.04)	0.01
< 1		
Episiotomy		
Yes	4.83 (0.33-0.39)	0.01
No		
Birthweight of newborn (gr)		
>4,000	0.35 (0.89-1.13)	0.10
<4,000		

Table 3 showed the multivariate analysis result of the association of age, parity, duration of labour, episiotomy, and birthweight with postpartum urinary retention in spontaneous labour. There were significant associations between episiotomy, duration of second stage labour, and primigravida, with postpartum urinary retention in spontaneous labour. Whereas age and birthweight were not significantly associated with postpartum urinary retention in spontaneous labour. This was shown in the risk factor of parity with OR = 1.11, 95% CI (0.42-0.63) with p-value of 0.02, and in episiotomy with OR = 4.83, 95% CI (0.33-0.39) with p-value of 0.01. Risk factor of age was OR = 1.20, 95% CI (0.67-2.14) with p-value 0.19. The risk factor of the second stage duration in primigravida was OR = 0.93, 95% CI (0.80-1.04), with a p-value of 0.01. Risk factor of birthweight was OR = 0.35, 95% CI (0.89-1.13) with p-value 0.10.

DISCUSSION

Pregnancy is marked by an alteration in some organs and organ systems. This alteration does not only occur anatomically, such as dilation of ureter and renal calyces but also functionally, such as the enhancement of glomerular filtration and urine output. During pregnancy, the bladder capacity is likely to adapt to functional alterations due to the enlarged uterine's compression, worsening as the gestational age gets older. During delivery, the bladder must also adapt to stretch and in urine production to prevent overdistention and facilitate the function of urine storage.^{9,10}

We have found 27 patients (77%) with obstetric risk factors of age >35 years old and 8 patients aged <35 years old. Our multivariate analysis showed no significant association between age and postpartum urinary retention incidence with a p-value of 0.19. This result was similar to the study in 2019, which stated that there was no significant association between age and the incidence of postpartum urinary retention in spontaneous labor with a p-value of 0.99.⁸

In this study, postpartum urinary retention in spontaneous labor was more prevalent in primigravida patients, which were 21 patients (60%), and when associated with bivariate analysis, primigravida has a p-value of 0.02, OR = 5.2, 95% CI (0.58-1.05). This result shows that there was a significant association between primigravida and postpartum urinary retention. It also implies that

postpartum urinary retention was more prevalent in primigravida than in multigravida. This result was also similar in 2002, which stated that postpartum urinary retention was more prevalent in primigravida than in multigravida ($p < 0.001$).¹¹

In this study, we also found a significant association between the duration of the second stage of labour in primigravida and postpartum urinary retention with a p-value of 0.02 OR = 0.93, 95% CI (0.80-1.04). This finding implies that postpartum urinary retention incidence was higher in patients with prolonged second stage labour. This condition is due to mechanical trauma in the bladder from such a long duration of labour or assisted vaginal delivery, which could cause trigonum edema and difficulty in voiding. Other mechanisms include mechanical trauma that could contribute to pelvic nerve injury, leading to the bladder's neurological impairment. Prolonged duration of second stage labour would cause prolonged stress on the pelvic floor, which causes pelvic tissue and nerve plexus injury, leading to outflow obstruction and "detrusor neuropraxia".¹² The study found a significant association between postpartum urinary retention and assisted vaginal delivery and labour duration of more than 700 minutes with a p-value of <0.001 and OR = 1.003, 95% CI (1.003-1.004).¹³ The factors that affect postpartum urinary retention and found that every 10 minutes increase in second stage labour causes 6% increase in postpartum urinary retention risk, and every 1-minute increase in the interval between postpartum period and first spontaneous voiding could increase the risk of postpartum urinary retention by 4%.¹⁴⁻¹⁶

We also found that postpartum urinary retention incidence was more prevalent in patients who underwent episiotomy, which are 30 patients (86%). Bivariate and multivariate analysis showed that there was an association between postpartum urinary retention and episiotomy with a p-value of 0.01. We found that more subjects underwent episiotomy with OR = 4.83, 95% CI (0.33-1.04). This finding was due to pudendal nerve injury, which can cause afferent input to the bladder and interfere with relaxation reflexes of the pelvic floor and urethral sphincter.⁶ This study contrasts which stated that episiotomy and the laceration of the birth canal did not increase the incidence of postpartum urinary retention ($p = 0.08$) and ($p = 0.44$).^{13,17,18}

Birthweight of more than 4000 grams occurred in 1 patient (3%), and birth weight of fewer than

4,000 grams occurred in 34 patients (97%). The bivariate and multivariate analysis results showed no association between birth weight and the incidence of postpartum urinary retention with a p-value of >0.025 , OR = 0.96, 95% CI (0.9-1.03). Birthweight was one of the risk factors of postpartum urinary retention due to its role in causing traumatic damage to the bladder from the baby's head compression, although we did not find a statistically significant association in this study.^{19,20} In 2019 also conducted this study and found that there was no association between birth weight and the incidence of postpartum urinary retention with a p-value <0.05 .⁸

CONCLUSION

There were significant associations between obstetric risk factors (parity, duration of second stage labour, and episiotomy) with postpartum urinary retention in spontaneous labour. Whereas age and birth weight were not significantly associated with postpartum urinary retention in spontaneous labour.

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