ORIGINAL RESEARCH

Profile of postpartum patients with urinary retention at Koja Regional Hospital, Jakarta, Indonesia

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ABSTRACT

Objective: Postpartum urinary retention (PPUR) is a common voiding disorder, defined as the inability to void spontaneously within 6 hours after delivery with a residual bladder volume exceeding 200 mL. High rates of PPUR in Indonesia indicate a need for greater awareness and intervention. This study aims to assess the incidence and potential contributing factors of PPUR among postpartum patients at Koja Regional Hospital in Jakarta, Indonesia.

Materials and Methods: A descriptive case-control study was conducted, including women who experienced urinary retention following vaginal delivery at Koja Hospital between September and December 2022. Residual urine volume was measured by catheterization 6 hours after delivery. Data analysis, performed using SPSS version 22, included patient demographics and clinical factors such as maternal age, parity, gestational age, neonatal birth weight, and postvoid residual urine volume. These factors were analyzed to determine their association with PPUR.

Results: Out of 300 subjects selected through consecutive random sampling, 63.7% experienced PPUR, while 36.3% had normal urinary function. Patients with a mean age of 26.91 ± 5.02 years ($p = 0.000$), primiparous status (first-time mothers) ($p < 0.001$), and a mean neonatal birth weight of 2980.95 ± 450.52 grams ($p = 0.000$) showed a higher risk of developing PPUR compared to other postpartum patients.

Conclusion: The study indicates a significant association between postpartum urinary retention and maternal factors, including younger age, primiparity, and higher neonatal birth weight. Identifying these high-risk factors can enhance PPUR management, allowing healthcare providers to implement targeted monitoring and preventive measures, potentially improving postpartum outcomes in this patient population. This underscores the importance of monitoring these risk factors to better manage and potentially mitigate the incidence of PPUR.

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Highlights:

1. Maternal age and fetal birth weight are key risk factors for PPUR.
2. Among 300 subjects, 63.7% experienced PPUR, identified using the Suskhan score, with catheterization as a useful tool for prevention and management planning.

INTRODUCTION

Postpartum urinary retention (PPUR) is defined as an inability to spontaneously void 6 hours after delivery, with a residual urine volume exceeding 200 mL. In Indonesia, PPUR incidence stands at 14.8%, with approximately 666,000 women affected annually. However, no comprehensive studies have recently analyzed PPUR in patients post-forceps delivery in Indonesia, though forceps use raises PPUR incidence by 38%.[1] In a study by Suskhan (2015), 13.6% of 500 women developed urinary retention,[2] while in Manado (2019), 10.67% of 365 women post-vaginal delivery experienced PPUR, with 9.27% asymptomatic and 1.4% symptomatic.[3] A Chinese study indicated that 69% of gynecological surgeries caused urinary retention, with vaginal deliveries accounting for 18.6% of cases. Known risk factors for PPUR include physiological changes during pregnancy, regional anesthesia, assisted delivery, perineal trauma, nulliparity, and prolonged labor (over 12 hours). Overstretching of the bladder may impair detrusor muscle function, complicating PPUR management and early detection. Catheterization aids spontaneous voiding but increases urinary tract infection (UTI) risk. Cavkaytar et al. (2014) found that urinary retention is more prevalent in primigravida women than in multigravida women.[4] In primigravida cases involving forceps, the cervical gland's hyperplasia and enlargement increase the likelihood of uterine inversion and bladder compression, hindering urethral drainage.[5] Ultrasound findings by Yang and Huang revealed that cervical displacement led to bladder compression, causing acute urinary retention in some cases.[6] PPUR can lead to postpartum hemorrhage, UTIs, puerperal fatigue, and delayed lactation. PPUR types include symptomatic (overt) and asymptomatic (covert); covert PPUR requires ultrasound or catheter measurement of residual urine, while symptomatic PPUR involves bladder sensation, contractility, and innervation issues, presenting as incomplete urination, frequency, and abdominal fullness.[7-9]

According to Indonesia's Badan Pusat Statistik, 4.8 million deliveries occurred in 2020, with 14.8% experiencing urinary retention, affecting 666,000 women annually. A recent report by RSCM (2022) shows decreased PPUR cases, with 19 inpatient and 58 outpatient cases, attributed to an improved scoring system for PPUR prevention. PPUR treatment at RSCM typically lasts 2–11 days, underscoring the need for further research on the risk factors, diagnostic effectiveness, and treatment outcomes of PPUR. This study aims to advance knowledge on postpartum urinary retention, offering insights that can inform prevention, diagnosis, and management strategies. Understanding the specific characteristics of PPUR patients at Koja Regional Hospital could guide health policy development, ensuring that postpartum care effectively meets patients' needs.

MATERIALS AND METHODS

This research was an analytical case-control study designed to examine the characteristics of postpartum urinary retention (PPUR) in patients from September to December 2022 at Koja Regional General Hospital. The study included all women who underwent vaginal delivery and experienced PPUR, selected through consecutive random sampling. Patients who provided informed consent underwent post-delivery urine volume measurement 6 hours after vaginal birth, with a residual volume of ≥200 mL considered indicative of urinary retention. Data collected included parity, maternal age, gestational age, neonatal weight, and residual urine volume, analyzed using SPSS version 22.

Data normality was assessed using the Kolmogorov-Smirnov test. Continuous variables with normal distribution were reported as mean ± standard deviation, while non-normally distributed data were expressed as median (range). Categorical variables were presented as numbers and percentages. Chi-square tests were used for statistical comparisons, with a logistic regression model applied to evaluate PPUR risk factors. A p-value of < 0.05 was considered statistically significant. The study protocol was approved by the Ethics Committee of the Faculty of Medicine, University of Indonesia (protocol number: 23-11-1916), ensuring ethical standards were met throughout the research process.

RESULTS

During the 3-month recruitment period, 300 subjects were enrolled based on the inclusion criteria. Of these, 191 women (63.7%) experienced postpartum urinary retention, while 109 cases were considered normal, as indicated in Table 1. The demographic details of both cases and controls are presented in Table 2. The mean age was 26.91 ± 5.02 years for women with urinary retention and 30.73 ± 5.83 years for those without urinary retention. Additionally, the mean birth weight of newborns was found to be statistically significantly higher in women with postpartum urinary retention, measuring 2980.95 ± 450.52 g, compared to 2838.59 ± 441.88 g in women without urinary retention. Furthermore, first-time mothers were statistically significantly more prevalent in patients with postpartum urinary retention (62.8%) compared to those without (37.2%). The mean gestational age in women with postpartum urinary retention was 38.50 ± 1.46 weeks, and in women without postpartum urinary retention, it was 38.28 ± 1.86 weeks, with the difference not reaching statistical significance ($p = 0.507$).

Table 1. Incidence of PPUR at Koja General Hospital

Groups	Frequency	Cumulative Index (CI)
PUR	191 (63.7%)	100.0 %
Normal	109 (36.3%)	36.3 %
Total	300 (100%)	

Table 2. Characteristics of patients with or without PPUR

		PPUR (n:191)	Normal (n:109)	P value
Age (years)		26.91 ± 5.02	30.73 ± 5.83	0.000*
Gestational Age (weeks)		38.50 ± 1.46	38.28 ± 1.86	0.507
Birth weight (grams)		2980.95 ± 450.52	2838.59 ± 441.88	0.013*
Parity	Primipara	62.8%	36.7%	<0.001
	Multipara	37.2%	63.4%	

Table 3. Logistic regression analysis of risk factors for PPUR

	P value	OR	95% CI for OR
Age (years)	0.000*	0.862	0.823 – 0.906
Birth weight (grams)	0.000*	1.001	1.001
Parity	<0.001	2.915	1.790-4.478

The results of this study found that age (p = 0.000, OR 0.86, 95% CI 0.82-0.90),birth weight (p = 0.000, OR 1.00, 95% CI 1.00) and parity (< 0.001, OR 2.915, 95% C 1.790-4.478) were found to have an impact on the incidence of postpartum urinary retention (PPUR) (Table 3).

DISCUSSION

This study aimed to evaluate the demographic characteristics of patients at Koja Regional Hospital that play a role in the occurrence of PPUR. In this study, 191 cases (63.7%) of 300 subjects were reported to have urinary retention post vaginal delivery. Outcomes are concerning as it is influenced by various factors, inaccuracies, different diagnostic criteria, and treatment modalities. According to several studies, risk factors in post-partum urinary retention patients include macrosomia births, prolonged labor, assisted delivery, perineal lacerations, induction of labor, assisted delivery, and fundal pressure during contractions. Additional factors include parity, the time of delivery, the use of analgesia during labor, and the period between delivery and the first voiding. A systematic review written by Li et al. (2020), concluded that the etiology resulting in an increased incidence of PPUR was the patients undergoing their first delivery (primigravidae).[7] The exact etiology of these risk factors is unknown. An article written by Nandy et al. (2023) explained that pelvic floor muscle (detrusor muscle) instability and stress urinary incontinence can be long-term complications of post-partum urinary retention. Overactivity of the detrusor muscle can cause involuntary contractions of the smooth muscle during bladder filling. Poor detrusor compliance causes the failure of the bladder to stretch, thus increasing the pressure.[11]

Outcomes have shown a mean age of 26.91 ± 5.02 years in urinary retention, which is significantly different from the control group. In Indonesia, the productive age for pregnancy is between 20 to 40 years. Based on previous studies, this age characteristic corresponds to the highest mean age in post-partum urinary retention, which is approximately 26 to 27 years of age. In this study, age risk analysis resulted in p = 0.000, OR 0.86, 95% CI 0.82-0.90 depicting a significant influence of age and the risk of urinary retention after vaginal delivery.[4,12-14]

Women who have never given birth (nulliparous) have a higher likelihood (OR 2.915) of experiencing postpartum urine retention (PPUR) compared to women who have given birth (multiparous). The increased risk of PUR in nulliparous women may be due to damage to the pelvic nerve plexus during vaginal delivery, resulting from the sudden and pronounced changes in pelvic anatomy. This can further elevate the risk of PUR when combined with changes or injuries that occur due to performing an episiotomy for instrumental deliver.[21]

The study's findings showed a significant relationship between the occurrence of urine retention following vaginal delivery and the newborn's birth weight. Maternities with macrosomic fetuses run the risk of

having a labor that lasts longer than expected because of the pelvic floor muscles' constant contraction, which can cause the pudendal nerve to stretch. The pudendal nerve regulates micturition, according to a number of published studies.[4,16] Changes after vaginal birth include mucosal edema, damage to the pudendal and perineum's innervation during labor, and enlargement of the detrusor muscle.[17] Under acute situations, the compensation cycle—which is characterized by hypoxia and increased blood flow to the serous tissue—is triggered by an overly distended bladder.[18] After vaginal delivery, the bladder's inability to adjust to this situation causes hindered urination, and distended bladder distention causes irreparable harm. Thus, further distention and dysfunction over a prolonged voiding interval can be avoided with an early diagnosis of RUPP. Catheterization can be used to prevent urine retention in cases of prolonged labor.[19]

We found that fetal weight significantly influences the risk of RUPP (p = 0.000, OR 1.00, 95% CI 1.00). This aligns with the findings of Neron et al., who reported that 45% of patients with a birth weight ≥ 4000 grams experienced urinary retention after vaginal delivery compared to those with a birth weight under 4000 grams, with p = 0.230 OR 1.95 (95% CI 0.65-5.84).[16] A birth weight exceeding 4000 grams doubles the risk of urinary retention after vaginal delivery. In this study, the average fetal birth weight in the urinary retention group was 2980.95 ± 450.52 grams, statistically differing from the control group. The urinary retention group with a heavier fetal birth weight showed a statistically significant result compared to the normal group (p = 0.013).

CONCLUSION

The study reveals a high prevalence of urinary retention following vaginal childbirth, underscoring concerns about the various factors, diagnostic variability, and diverse treatment approaches that influence outcomes. Key risk factors such as maternal age, newborn birth weight, and parity significantly impact urinary retention incidence. Further research is essential to explore the underlying mechanisms of yet unidentified risk factors, facilitating the development of more precise and effective interventions.

DISCLOSURES

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Conflict of interest

The authors declare that there are no conflicts of interest.

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Informed Consent

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