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Prevalence of overt postpartum urinary retention and its risk factors: study in a tertiary care center, Jumla

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ABSTRACT

Introduction: Postpartum urinary retention (PUR) is the inability to void voluntarily after delivery, with overt PUR defined as no spontaneous voiding within six hours post-vaginal delivery or requiring re-catheterization post-cesarean. In rural Nepal, PUR risks bladder overdistension, detrusor failure, and renal complications due to limited monitoring. This study assessed the prevalence of overt PUR and risk factors, including primigravida status, gestational age, neonatal birth weight, delivery mode, perineal tears, episiotomy, vulvar edema, and prepartum catheterization.

Methods: This was a Prospective cross-sectional study conducted at Karnali Academy of Health Sciences, Jumla, from November 2022 to July 2023 among postpartum females. Data were collected using a pre-formatted pro forma after obtaining informed consent. Sampling was conducted using a convenience sampling technique, with a sample size of 78 (expected prevalence: 5.37%; 95% CI; 5% margin of error). Analysis was done in Microsoft Excel and SPSS v16.0. Chi-square, Fisher's exact, and Mann-Whitney U tests were applied based on the data distribution.

Results: Overt PUR prevalence was 3 (3.8%). Primigravida was significantly associated (p=0.027). No significant associations were observed with age (median 24 years), gestational age (91% at term, p=0.750), neonatal weight (median 3000 grams, p=0.471), delivery mode (67% vaginal, p=0.547), perineal tears (first degree, p=0.99, second degree, p=0.280), episiotomy (p=0.216), vulvar edema (p=0.99), or catheterization (p=0.547).

Conclusion: Primigravida elevates overt PUR risk in rural settings; recommend targeted postpartum screening for primipara to prevent complications.

Keywords: Nepal, Postpartum Urinary Retention, Pregnancy Complications, Puerperal Disorders, Rural Health Services, Tertiary Care Centers, Urinary Retention

INTRODUCTION

Urinary retention is the inability to void urine voluntarily, categorized as acute or chronic.[1] In the obstetric context, Postpartum Urinary Retention (PUR) is a frequent complication following delivery.[2] It is classified into two types: overt PUR, where a woman is unable to urinate spontaneously within 6 hours of vaginal delivery (or requires re-catheterization after cesarean section), and covert PUR, characterized by a post-void residual volume 150 mL.[3, 4]

Physiologically, pregnancy-induced hormonal changes, particularly the inhibitory effect of progesterone on smooth muscles, lead to decreased bladder tone and increased capacity.[5, 6] By the 38th week, bladder capacity can reach 1000–1200 mL, significantly altering pressure-volume dynamics.[7] During labor, vaginal delivery may cause trauma to the pelvic floor muscles and innervations, leading to reduced sensitivity or mechanical obstruction from vulvar edema.[4, 8] If left unmanaged, PUR can result in bladder denervation, detrusor failure, hydronephrosis, and even kidney failure.[4]

Previous literature suggests that risk factors include instrumental delivery, primiparity, perineal trauma, and prolonged labor, though the impact of epidural analgesia remains debated.[9, 10] While PUR contributes significantly to maternal morbidity and decreased quality of life, data from rural tertiary settings is limited.[1] Understanding these dynamics in such settings is essential for improving maternal care and minimizing long-term bladder dysfunction.

Globally, PUR is a well-documented complication with a reported incidence ranging from 0.45% to 17.9%.[11,12] Significant independent risk factors identified in western cohorts include primiparity, instrumental delivery, and the use of regional or epidural analgesia, which can increase the risk of retention by up to three times.[11-13] Regionally, studies from China and Turkey have further highlighted that PUR is highly associated with episiotomy, second-degree perineal tears, vulvar edema, and prolonged third-stage labor.[1, 4] While most cases resolve before hospital discharge, the condition remains a concern due to potential morbidities such as spontaneous bladder rupture and long-term micturition symptoms.[12, 14] Locally in Nepal, there is a scarcity of data regarding the prevalence and specific risk factors for PUR in rural tertiary settings, where obstetric practices and patient demographics may differ from global trends.[1, 4, 15]

This study aims to address this gap by assessing the prevalence of overt PUR at a tertiary care center in Jumla. Furthermore, we seek to determine the association between PUR and specific risk factors, including gravida, gestational age, neonatal birth weight, mode of delivery, and the presence of vulvar edema or perineal tears.

METHODS

A prospective, hospital-based cross-sectional study was conducted at the maternity ward of Karnali Academy of Health Sciences (KAHS), a tertiary care center in rural Jumla, Nepal. Data was collected between November 2022 to July 2023 to assess the prevalence and risk factors of overt PUR. The study population included all postpartum women who underwent institutional delivery at KAHS during the study period. Participants were selected using a non-probability convenience sampling technique. Inclusion criteria included all women, regardless of mode of delivery.

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Exclusion criteria included women with a known history of urinary tract disease, overactive bladder, pelvic organ prolapse, or previous bladder surgery. Patients who declined to provide informed consent were also excluded.

Diagnosis postpartum urinary retention was defined as the absence of spontaneous micturition within 6 hours of vaginal delivery; in the case of cesarean section, it is described as no spontaneous micturition within 6 hours after the removal of an in-dwelling catheter (more than 24 hours after delivery).[16] The primary outcome was the prevalence of overt PUR. Independent variables included demographic profiles and obstetric history (gravida, gestational age, neonatal birth weight, mode of delivery, and presence of vulvar edema or perineal tears). Data were collected by the principal investigator using a structured proforma. To ensure validity and reliability, the tool was developed based on extensive literature review and refined through expert and peer review. Based on a previously reported PUR prevalence of 5.37%, with 95% confidence interval (Z=1.96), and a 5% margin of error, the minimum required sample size was determined to be 78 participants.[1]

Data were initially recorded in MS Excel and subsequently imported into SPSS version 16.0 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. For inferential statistics, the Chi-square test was employed to determine associations between categorical variables. For continuous variables, an unpaired T-test was used for normally distributed data; otherwise, non-parametric alternatives were applied. A p-value < 0.05 was considered statistically significant. To minimize selection bias, all eligible women during the study period were invited to participate until the sample size was reached.

Ethical approval was obtained from the Institutional Review Committee of KAHS, Jumla (Reference no: 079/080/39) on 23rd November 2022. Participation was voluntary, and written informed consent was obtained from all subjects after providing a participant information sheet. Confidentiality of all personal and medical data was strictly maintained.

RESULTS

The study assessed 78 participants for PUR. The results showed that overt PUR was present in 3 (3.8%) women and absent in 75 (96.2%) participants. The age distribution of study participants was non-normal distribution (Kolmogorov-Smirnov and Shapiro-Wilk test p-values < 0.05). The median age of participants in the study was 24 years, with an interquartile range of 7.

The association between different age groups and the presence or absence of overt PUR was assessed. Table 1 shows no significant association between age groups and overt PUR (p = 0.390) .(Table 1)

Table 1: Association of age with overt PUR (n=78)

Age	Overt PUR Present	Overt PUR Absent	P value
<20 years	0	6	0.390*
20-25 years	3	37	
26-30 years	0	19	
31-35 years	0	11	
36-40 years	0	2	

***Fisher Exact test**

The largest proportion of the study population consisted of primigravida (Gravida 1) at 24 (31%), followed by Gravida 2 at 18 (23%) and Gravida 3 at 16 (21%). Gravida 4 was observed in 12 (15%) participants, and Gravida 5 in 4 (5%). Higher-order gravidity was significantly less common, with Gravida 7 representing 2 (3%) participants and Gravida 6 and Gravida 8 each accounting for 1 (1%) participant. Similarly, the association of gravida into primiparous and multiparous was assessed based on either the presence or absence of overt PUR. It showed a significant association between primigravida and the presence of overt PUR among the participants, with a p-value of <0.05 (as one data point is less than 5), as shown in Table 2.

Table 2: Association of primigravida and multi gravida with overt PUR

	Gravida (Primi)	Gravida (Multi)	P value
Overt PUR Present	3	0	0.027**
Overt PUR Absent	21	54	

****Fisher Exact test**

Regarding gestational age at delivery among the 78 participants, the vast majority were term deliveries, accounting for 71 (91%). Preterm deliveries were observed in 4 (5%) participants, while post-term deliveries represented the remaining 3 (4%) of the study population. In terms of the mode of delivery, the majority of the participants underwent vaginal delivery, totaling 52 (67%). The remaining 26 (33%) of the study population underwent Lower Segment Cesarean Section (LSCS).

When assessing the association between gestational age at delivery and overt PUR, the analysis showed no association (i.e., p=0.750), as shown in Table 4.

Table 3: Association between different gestational age of delivery and overt PUR (n=78)

	Urinary retention present	Urinary retention absent	P value (Fisher's Exact test)
Preterm	0	4	0.750
Term	3	68	
Post term	0	3	

The association between two modes of delivery and the presence or absence of overt PUR was assessed. Table 5 shows that there is no significant association between the modes of delivery and overt PUR, i.e., a P-value = 0.547).

Table 4: Association between modes of delivery and overt PUR

	Modes of delivery		P value
	Vaginal	LSCS	
Overt PUR Present	3	0	0.547**
Overt PUR Absent	49	26	

****(Fischer's Exact test**

The association between neonatal birth weight and overt PUR was also assessed. The median weight of neonates was 3,000 grams, with an interquartile range of 563 grams. The minimum birth weight of neonates delivered by study participants was 1,700 grams, while the maximum was 3,700 grams. Independent-Samples Mann-Whitney U Test did not find any significant association between neonatal birth weight and overt PUR (p-value = 0.471)).

Table 5: Association between neonatal birth weight and overt PUR

	Neonatal weight (IQR)	P value
Overt PUR Present	3250 (800)	0.471*
Overt PUR Absent	3000 (2000)	

***Independent-Samples Mann-Whitney U Test**

The association between different types of perineal tear i.e. first-degree perineal tear, second degree perineal tear and episiotomy among the study participants with overt PUR was carried out. It showed that there was no significant association between different types of perineal degree tears and overt PUR (first degree tear, p value = 0.99 and second degree tear, p value = 0.280). The association between

vulvar edema among the study participants and overt PUR showed no significant association between vulvar edema and overt PUR (p value = 0.99). The association between prepartum catheterization among the study participants and overt PUR showed no significant association between prepartum catheterization and overt PUR (p-value = 0.547).

DISCUSSION

PUR can be classified as overt, covert, or persistent. Overt PUR is symptomatic, requires treatment, and may result in persistent PUR if inadequately managed, while covert PUR is asymptomatic and mostly self-healing. The WHO definition of the postpartum period, beginning one hour after the delivery of the placenta and continuing until six weeks after the baby's birth, was used as the inclusion period in this study.[17]

PUR is a condition that continues to pose challenges in obstetric care. This study aimed to determine the prevalence of overt PUR among institutional deliveries at a tertiary care center in Jumla. The prevalence of overt PUR among institutional deliveries at KAHS was 3.8%. This data aligned with the study findings conducted by Saultz et al., where the reported incidence rate of postpartum urinary retention is 1.7-17.9%.[11]

However, some studies, such as those conducted by Cao et al. reported a higher prevalence of overt postpartum urinary retention of 5.37%.[1] Meanwhile, one study done by Glavind et al. reported the incidence of postpartum urinary retention as low as 0.7%.[18] There seems to be a vast disparity among studies, and limited studies have been conducted on the prevalence of postpartum urinary retention. Another study by Liang et al. reported an overall incidence of postpartum urinary retention of 24.1%, with overt and covert PUR at 7.4% and 16.7%, respectively.[19] In another study by Yip et al., the incidence of overt and covert retention was 4.9% and 9.7%, respectively.[15] In a study by Ghanbarpour et al., the prevalence of overt and covert urinary retention was 56.9% and 43.1%, respectively.[20] Thus, variable differences can be seen in the incidence of postpartum urinary retention. This significant variation in morbidity may be due to the different definitions of overt PUR, sample sizes, and inclusion criteria, such as including women who deliver via cesarean section and clinical settings.

The specific causes of PUR are not well understood. Multiple factors related to pregnancy and labor may cause muscle and nervous tissue damage, which can eventually lead to PUR. In previous studies, univariate analyses confirmed that PUR was commonly associated with epidural analgesia, prolonged stages of labor, episiotomy, instrumental delivery, perineal tears, vulvar edema, neonatal birth weight, and other factors.[21] So, this study took common factors from various studies as independent factors.

The median age of participants in the study was 24 years, with an interquartile range of 7 years. Chung et al. examined the relationship between women's various parameters and PUR and found that age, birth weight, and fetal head circumference were not different between the two groups.[12] However, a study by Ghanbarpour et al. found that mothers in the age groups of 20-25 and 26-30 were at risk of urinary retention.[20]

One of the key findings of this study was the significant association between primigravida status and overt PUR, i.e., Fischer's exact test of <0.05. this finding aligned with Carley et al., who reported a higher prevalence of PUR among primigravida likely due to prolonged labor, instrumental deliveries and increased perineal trauma than multigravidas.[22] There were more confounding factors among primigravida, like higher rates of instrumental delivery, recipients of regional anesthesia, and episiotomy. They all fall under risk factors for PUR, which ultimately leads to PUR. Similarly, Saultz et al. demonstrated that nulliparity was a key risk factor for urinary retention.[11] However, some conflicting evidence exists as shown in a study by Ghanbarpour et al., the odds of covert urinary retention in women having 3-4 previous deliveries were 0.009 times as in those without previous deliveries (P=0.01).[20]

Ghanbarpour et al. showed a gestational age of 38 weeks or more, being at high risk for PUR. The odds of overt urinary retention in women with 38-39 weeks of pregnancy were 0.45 times as in women with 35-36 weeks of pregnancy.[20] The median weight of neonates was 3000 grams, with an interquartile range of 563 grams. The minimum birth weight of neonates delivered by study participants was 1700 grams, and the maximum was 3700 grams. There was no significant association between neonatal birth weight and overt PUR. In a study carried out by Cavkaytar et al., they identified that a prolonged second stage of labor and delivery of a macrosomic newborn with a birth weight of > 4000 grams were the risk factors associated with the occurrence of PUR.[2]

Epidural analgesia directly affects bladder sensitivity and contractility. Epidural analgesia may help to reduce labor pain while the nerves of the bladder are anesthetized at the same time. This hurts the connection between the pontine micturition center and the bladder, which inhibits the reflex mechanism that usually causes urination. Subsequently, the bladder may become over-distended, which reduces the contractility of the bladder. The impact of epidural analgesia on PUR was not explored in this study due to its unavailability at the study site. The study participants didn't receive epidural anesthesia, so our study had limitations. There have been study findings that epidural analgesia is one of the independent risk factors contributing to PUR. Epidural can extend the duration of labor and increase the chances of an instrumental delivery, which could lead to pelvic floor trauma, pudendal nerve damage, and perineal edema, resulting in mechanical obstruction and bladder motility problems after childbirth.[23] The average length of administration of epidural analgesia was significantly greater in women with postpartum urinary retention compared with control cases in a similar study conducted by Carley et al.[22]

Episiotomy and second-degree perineal tears were identified as independent risk factors for PUR, which aligns with previous studies' findings. However, no significant association was found between different types of perineal tear i.e. first, second degree and episiotomy among the study participants which is inconsistent with previous studies. For instance, in a systematic review by Mulder et al., episiotomy was found to be directly related to PUR.[14] They also reported that second-degree or worse obstetrical lacerations increased the risk of PUR by 3.66-fold.[14] The mechanism is yet to be determined, but it may be that pain caused by perineal trauma leads to changes in bladder sensation, central nervous system inhibition, and persistent urethral spasm. However, there is a lack of consensus in the literature regarding the independent contribution of episiotomy to PUR.[1]

Regarding mode of delivery, the study found no significant association between vaginal delivery, cesarean section and PUR. In contrast, Kermans et al. reported postpartum urinary retention in 2.1% of women with vaginal and 3.2% of women delivered by cesarean delivery. Instrument-assisted delivery may damage the pelvic, pudendal, and peripheral nerves, impairing the reflexes and voluntary mechanisms required for urination and mechanical outlet obstruction due to vulvar edema or hematoma.[24]

Postpartum morbidity was higher in cesarean delivery as compared to vaginal delivery in patients delivered in the study participants by Shrestha et al.[17] In this study, eight patients, 7.69%, had urinary tract infections, and three of them presented with urine retention.

At present, published data are limited to the relationship between postoperative analgesia after cesarean delivery and PUR. Evron et al. investigated PUR in 120 women undergoing cesarean delivery under epidural anesthesia who also received either epidural morphine, epidural methadone, or non-opiate drugs for postoperative pain relief.[19] They found the highest incidence of urinary disturbances occurred after postoperative epidural morphine analgesia, as exemplified by the low volumes of urine voided and the prolonged time to first micturition. In their study, 57.5% of patients who received postoperative epidural morphine needed urethral catheterization due to micturition difficulty. An analysis of a population of maternity patients who delivered vaginally has demonstrated urinary retention compared with analogous controls by Ching-Chung et al.[12]

This study's generalizability is limited by its small sample size (78) and single-center design, which precluded the assessment of long-term outcomes and pre-existing urological confounders. Additionally, the unavailability of epidural analgesia at the study site prevented evaluation of a significant, well-known risk factor for Postpartum Urinary Retention.

CONCLUSION

This study found a 3.8% prevalence of overt postpartum urinary retention (PUR) at a rural tertiary center in Jumla, Nepal, with primigravida status as the sole significant risk factor (p=0.027). No associations were observed with delivery mode, perineal trauma, vulvar edema, or neonatal birth weight, highlighting unique rural obstetric patterns. Routine postpartum bladder screening is recommended for primiparous women to prevent complications like detrusor failure and renal morbidity.

DECLARATION

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Author Contribution

DM, lead the research concept, study design, literature search, and data collection. She also drafted the manuscript, participated in the critical review, provided final approval, agreed to be accountable for the work, and handled all correspondence with the journal. JB contributed to the research concept, conducted the data analysis and interpretation, and was involved in drafting, reviewing, and final approval of the manuscript. AP and PT both contributed to the initial research concept and were involved in the critical review and final approval process, with PT also assisting in data interpretation. Finally, PM and SG focused their contributions on the latter stages of the project, specifically reviewing the manuscript for intellectual content, providing final approval for submission, and sharing accountability for the overall work.

Ethical Approval

Ethical approval was obtained from the Institutional Review Committee of KAHS, Jumla (Reference no: 079/080/39) on 23rd November 2022.

Consent/Assent

Informed consent was taken from all the participants for the study.

Data Availability Statement

The date of the study will be provided to the editorial team on the request.

Conflicts of Interest

None

Source of Funding

None

REFERENCES

1. Cao D, Rao L, Yuan J, Zhang D, Lu B. Prevalence and risk factors of overt postpartum urinary retention among primiparous women after vaginal delivery: a case-control study. BMC Pregnancy Childbirth. 2022;22(1):26. | DOI |
2. Cavkaytar S, Kokanali MK, Baylas A, Topcu HO, Laleli B, Tasci Y. Postpartum urinary retention after vaginal delivery: Assessment of risk factors in a case-control study. J Turk Ger Gynecol Assoc. 2014;15(3):140-3. | DOI |
3. Dolezal P, Ostatnikova M, Balazovjechova B, Psenkova P, Zahumensky J. Covert postpartum urinary retention: causes and consequences (PAREZ study). Int Urogynecol J. 2022;33(8):2307-14. | DOI |
4. Polat M, Senturk MB, Pulatoglu C, Dogan O, Kilicci C, Budak MS. Postpartum urinary retention: Evaluation of risk factors. Turk J Obstet Gynecol. 2018;15(2):70-4. | DOI |
5. Uzelpasaci E, Cinar GN, Baran E, Gursen C, Nakip G, Ozgul S, et al. Trimester-based changes in urogenital symptoms and their impact on the quality of life in pregnant women: A preliminary report. Curr Urol. 2021;15(3):167-71. | DOI |
6. Fernandes VS, Ribeiro AS, Martinez-Saenz A, Blaha I, Serrano-Marguello D, Recio P, et al. Underlying mechanisms involved in progesterone-induced relaxation to the pig bladder neck. Eur J Pharmacol. 2014;723:246-52. | DOI |
7. Malbrain ML, Deeren DH. Effect of bladder volume on measured intravesical pressure: a prospective cohort study. Crit Care. 2006;10(4):R98. | DOI |
8. Afshan N, Gokhale L. 'Vulval oedema': a conundrum! BMJ Case Rep. 2015;2015. | DOI |
9. Fonti Y, Giordano R, Cacciatore A, Romano M, La Rosa B. Post partum pelvic floor changes. J Prenat Med. 2009;3(4):57-9. | Full Text |
10. Liang CC, Wong SY, Tsay PT, Chang SD, Tseng LH, Wang MF, et al. The effect of epidural analgesia on postpartum urinary retention in women who deliver vaginally. Int J Obstet Anesth. 2002;11(3):164-9. | DOI |
11. Saultz JW, Toffler WL, Shackles JY. Postpartum urinary retention. J Am Board Fam Pract. 1991;4(5):341-4. | Full Text |
12. Ching-Chung L, Shuenn-Dhy C, Ling-Hong T, Ching-Chang H, Chao-Lun C, Po-Jen C. Postpartum urinary retention: assessment of contributing factors and long-term clinical impact. Aust N Z J Obstet Gynaecol. 2002;42(4):365-8. | DOI |
13. Musselwhite KL, Faris P, Moore K, Berci D, King KM. Use of epidural anesthesia and the risk of acute postpartum urinary retention. Am J Obstet Gynecol. 2007;196(5):472 e1-5. | DOI |
14. Mulder FE, Hakvoort RA, Schoffelmeer MA, Limpens J, Van der Post JA, Roovers JP. Postpartum urinary retention: a systematic review of adverse effects and management. Int Urogynecol J. 2014;25(12):1605-12. | DOI |
15. Yip S-K, Sahota D, Pang M-W, Chang A. Postpartum urinary retention. Acta obstetricia et gynecologica Scandinavica. 2004;83(10):881-91. | Full Text |
16. Mohr S, Raio L, Gobrecht-Keller U, Imboden S, Mueller MD, Kuhn A. Postpartum urinary retention: what are the sequelae? A long-term study and review of the literature. Int Urogynecol J. 2022;33(6):1601-8. | DOI |
17. Shrestha P, Mahato V, Karmacharya SS. Postpartum Maternal Morbidity Requiring Hospital Admission in A Teaching Hospital: A Descriptive Cross-sectional Study. JNMA J Nepal Med Assoc. 2020;58(229):686-9. | DOI |
18. Glavind K, Bjork J. Incidence and treatment of urinary retention postpartum. Int Urogynecol J Pelvic Floor Dysfunct. 2003;14(2):119-21. | DOI |
19. Liang CC, Chang SD, Chang YL, Chen SH, Chueh HY, Cheng PJ. Postpartum urinary retention after cesarean delivery. Int J Gynaecol Obstet. 2007;99(3):229-32. | DOI |
20. Ghanbarpour A, Barat S, Amirkhanloo F, Hajian K, Bouzari Z. Factors Affecting Postpartum Overt and Covert Urinary Retention After Vaginal Delivery. International Journal of Women's Health & Reproduction Sciences. 2023;11(2). | Full Text |
21. Wibowo N. Obstetrics Service after Covid-19 Pandemic. Indonesian Journal of Obstetrics and Gynecology. 2021;9(4):173. | Full Text |
22. Carley ME, Carley JM, Vasdev G, Lesnick TG, Webb MJ, Ramin KD, et al. Factors that are associated with clinically overt postpartum urinary retention after vaginal delivery. Am J Obstet Gynecol. 2002;187(2):430-3. | DOI |
23. Li Q, Zhu S, Xiao X. The risk factors of postpartum urinary retention after vaginal delivery: a systematic review. International journal of nursing sciences. 2020;7(4):484-92. | DOI |
24. Snooks SJ, Swash M, Henry MM, Setchell M. Risk factors in childbirth causing damage to the pelvic floor innervation. Int J Colorectal Dis. 1986;1(1):20-4. | DOI |