



Original Article



Frequency of Covert Urinary Retention in Women after Vaginal Birth of Baby

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ABSTRACT

Postpartum Covert Urinary Retention (PPUR) is a medical condition in which a woman's spontaneous ability to micturate is present and the patient passes urine but the problem lies with the residual volume of urine as it was higher than normal. Sufficient data were lacking so this study will help us to determine the disease burden in our population to do better management. **Objective:** To determine the frequency of postpartum covert urinary retention in females after the birth of a baby through the vaginal route. **Methods:** It was a cross-sectional survey, conducted in Lady Willingdon Hospital, Lahore, from April 2019 to October 2019. A total of 383 patients fulfilling the inclusion and exclusion criteria were taken by non-probability consecutive sampling. As soon as the patients pass urine after the vaginal birth of the baby, a transabdominal ultrasound was planned to get an estimated value of postvoid residual urine volume. All gathered data were entered and analyzed using SPSS version 22.0. **Results:** The mean age was 30.14 ± 5.06 years. The mean gestational age was 39.58 ± 1.73 weeks. In 163 (42.6%) females, epidural analgesia was used, among 152 (39.7%) females, episiotomy was done and 225 (66.6%) females had prolonged duration of labor. In 200 (52.2%) females, had covert urinary retention while 183 (47.8%) did not. **Conclusions:** It was concluded that more than half i.e. 52.2% of the females had covert urinary retention. Hence appropriate attention must be ensured to nationally accepted definitions and management algorithms in the post-natal stage to reduce the burden of disease in our community.

INTRODUCTION

Postpartum Urinary Retention (PPUR) is a medical issue that is characterized by the sudden start of a painful or painless inability to pass urine, causing the need for catheterization of the bladder after twelve hours of the birth of the baby [1]. PUR is a usual problem of bladder dysfunction after passing through the process of Vaginal Delivery (VD) [2, 3]. Postpartum urinary retention is usually bifurcated into overt and covert retention. Overt (symptomatic) urinary retention is characterized by a situation when women are not able to pass urine voluntarily within six hours after the birth of a baby (vaginal route). Patients with covert PUR have the ability to micturate

voluntarily on their own but the problem lies with the value of estimated Postvoid Residual Urine Volume in the bladder (PVRV) which is ≥ 150 ml [1]. In the overt kind of the issue, patients suffering from symptomatic PUR are commonly picked up easily and early, just because the reflex of micturition is not possible due to symptoms like lower abdomen ache or hemorrhage after delivery. There are multiple factors responsible for covert PUR as perineal episiotomy, epidural analgesia used for pain relief and baby birth weight [3]. Women presented with a covert kind of PUR are usually hard to pick up just because the spontaneous ability to micturate is present but the residual



urine volume in the bladder is higher than normal [4]. Postpartum urinary retention may give rise to many local and overall issues in these women, like postpartum infection and damage of bladder wall muscle and denervation. Bladder dysfunction can occur in such patients in the latter half of life when they suffer from the issue of incomplete bladder emptying in the early half of life [5]. After delivery, bladder volume can be estimated by using ultrasound which is considered a simple, non-invasive method [6, 7]. As a study reported, out of 745 women, covert PUR (PVRV ≥ 150 mL) was diagnosed in 347 (47%) patients which is quite high [3].

The objective of the current study is designed to determine the frequency of postpartum covert urinary retention in females after the birth of a baby (vaginal route) in our local population. As no study is available and a study reported high frequency i.e. 47% [3]. This study can help to generate baseline data and we will be able to know the burden of covert PUR in our population. If we find high statistics as reported in the literature then in the future all females will be evaluated for covert PUR, so timely intervention can be done to lessen the morbidity such as bladder injury and discomfort to the females.

METHODS

This cross-sectional study was carried out at Postnatal Ward, Gynecology and Obstetrics Department, Lady Willingdon hospital Lahore from April 2019 till October 2019, by non-probability consecutive sampling technique. Ethical approval of the study was taken (Ref No: CPSP/REU/OBG-2016-066-7886). A total of 383 females were estimated using percentage of covert urinary retention 47% 95% confidence level and 5% margin of error was used [3]. Females with age 18-40 years, any parity, undergone vaginal delivery and remained in ward after 6 hours were included in the study while females with history of any pelvic surgery, prior diagnosis of urology and nephrology disease, having UTI during pregnancy and macrosomic babies (birth weight > 4000 g) were excluded from the study. After taking an informed consent and confidentiality, their demographic information such as name, age, parity, gestational age and risk factors like epidural analgesia, episiotomy and duration of labour were noted through face to face interview and structured questionnaire. Then transabdominal ultrasound was performed to estimate postvoid residual urine volume as soon as they first micturate just after birth of their baby [1]. Postpartum Covert urinary retention was labelled (after 6 hours of delivery if there was postvoid residual bladder urine volume of more than 150 ml, detected by ultrasonography after voluntary micturate of patient). All data were entered on proforma and analyzed using SPSS version 22.0. For quantitative data (age and gestational

age) mean \pm standard deviation was used. For qualitative data such as Postpartum Covert urinary retention and for parity, frequency and percentage was used. Data were stratified for age, parity, epidural analgesia, episiotomy, duration of labor (normal or delayed) and obesity (BMI > 30) just to address the issue of bias, confounders and effect of modifiers. Post stratified Chi-square test was applied considering p-value < 0.05 as significant.

RESULTS

The mean age of females was 30.14 ± 5.06 years. The mean gestational age was 39.58 ± 1.73 weeks, there were 146 (38.1%) obese females and 237 (61.9%) females were non-obese. There were 220 (57.4%) females who had parity < 4 and 163 (42.6%) had parity ≥ 4 . In 163 (42.6%) patients, epidural analgesia was used and among 152 (39.7%) female episiotomy was done. There were 225 (66.6%) females who had prolonged duration of labour. Out of total patients, 200 (52.2%) females had covert urinary retention while 183 (47.8%) do not have (Table 1).

Table 1: Descriptive Statistics of Study Participants

Variables	Mean \pm S.D/ N	
Age	30.14 \pm 5.06	
Gestational Age	39.58 \pm 1.73	
Parity	<4	>4
	220	163
BMI	Obese	Non Obese
	146	237
Duration of Labour	Prolonged	Normal
	225	178
Variables	Yes	No
Epidural Analgesia	163	220
Episiotomy	152	231
Covert Urinary Retention	200	183

Among 18-29 years old females, 91 (50.8%) cases had covert urinary retention while 109 (53.4%) females were noted among 30-40 years' age group, with no statistical difference, p-value > 0.05 . In females having parity < 4 , 114 (51.8%) females had covert urinary retention and among females who had ≥ 4 parity, 86 (52.8%) cases identified. p-value > 0.05 . Among females who had epidural analgesia, 92 (56.4%) cases had covert urinary retention and among those in which epidural analgesia was not used, 108 (49.1%) cases identified, with no statistical difference. Covert urinary retention was noted among females who had episiotomy, and 77 (50.7%) cases in which episiotomy was not done, p-value > 0.05 . In females who had normal duration of labour, 134 (52.5%) cases had covert urinary retention while in females who had prolonged duration of labour, 66 (51.6%) females had covert urinary retention and the frequency was statistically same regardless of duration of labour, p-value > 0.05 . Among obese and non-obese cases, 82 (56.2%) females and 118 (49.8%) of the cases had covert urinary retention with no statistical difference, p-

value > 0.05 (Table 2).

Table 2: Comparison of Covert Urinary Retention with Respect to Age, Parity, BMI, Epidural Analgesia, Episiotomy and Duration of Labour

Variables		Covert Urinary Retention		Total Mean \pm SD /N (%)
		Yes Mean \pm SD /N (%)	No Mean \pm SD /N (%)	
Age Groups (Years)	18-29	91 (50.8%)	88 (49.2%)	179 (100%)
	30-40	109 (53.4%)	95 (46.6%)	204 (100%)
Total		200 (52.2%)	183 (47.8%)	383 (100%)
Chi-Square		0.257	p-Value	0.612 (Insignificant)
Parity	<4	114 (51.8%)	106 (48.2%)	220 (100%)
	\geq 4	86 (52.8%)	77 (47.2%)	163 (100%)
Total		200 (52.2%)	183 (47.8%)	383 (100%)
Chi-Square		0.033	p-Value	0.855 (Insignificant)
BMI	Obese	82 (56.2%)	64 (43.8%)	146 (100%)
	Non-Obese	118 (49.8%)	119 (50.2%)	237 (100%)
Total		200 (52.2%)	183 (47.8%)	383 (100%)
Chi-Square		1.472	p-Value	0.225 (Insignificant)
Epidural Analgesia	Yes	92 (56.4%)	71 (43.6%)	163 (100%)
	No	108 (49.1%)	112 (50.9%)	220 (100%)
Total		200 (52.2%)	183 (47.8%)	383 (100%)
Chi-Square		2.028	p-Value	0.154 (Insignificant)
Episiotomy	Yes	77 (50.7%)	75 (49.3%)	152 (100%)
	No	123 (53.2%)	108 (46.8%)	231 (100%)
Total		200 (52.2%)	183 (47.8%)	383 (100%)
Chi-Square		0.246	p-Value	0.620 (Insignificant)
Duration of Labor	Normal	134 (52.5%)	121 (47.5%)	255 (100%)
	Prolonged	66 (51.6%)	62 (48.4%)	128 (100%)
Total		200 (52.2%)	183 (47.8%)	383 (100%)
Chi-Square		0.033	p-Value	0.855 (Insignificant)

DISCUSSION

Postpartum urinary retention which is labeled as voiding dysfunction is a usual post-natal issue, characterized by the inability to empty the bladder completely after delivery of a baby. If the issue of voiding dysfunction remains undiagnosed early, then it may lead to bladder distension which further progresses to bladder denervation, bladder wall muscle atony, and permanent voiding dysfunction. Postpartum urinary retention requires timely detection and intervention, however, the prevalence of disease during the postpartum period has a broad spectrum. Recognition and consideration of risk factors as soon as delivery was over, and prompt diagnosis were important in order to implement appropriate management and prevention of negative sequelae. Future studies were needed to assess the contribution of early systematic bladder scanning in patients with risk factors for early diagnosis of PUR [8-11]. The rough estimate of the

incidence of PPUR has a wide variation of 0.18 to 14.6%, and this variety was only possible because there were inconsistent definitions of PPUR, which may include overt (symptomatic) urinary retention, covert (asymptomatic) urinary retention and persistent urinary retention [12]. The inability to micturate voluntarily within a time period of six hours after the birth of a baby (vaginal route) or six hours after removal of an indwelling urinary catheter (IDC) was labeled as overt PPUR while if there was a postvoid residual urinary bladder volume (PVRBV) of >150 mL after voluntary micturition, then it was labeled as covert PPUR [13]. Although most cases were self-limited, a high index of suspicion was needed to institute timely treatment with intermittent catheterization given the morbidity associated with sustained bladder overdistension postpartum [14]. Salemic identified a proven link between PPUR and longer duration of the second stage of labor and perineal episiotomy in the mediolateral direction; as two hundred patients delivered babies through the normal vaginal route [15]. Another research by Ren identified the incidence of PUR was 49.85% [16]. In a study conducted by Li Son postpartum women undergoing vaginal delivery with labor epidural analgesia showed a high incidence of overt PUR, and health-care providers should pay more attention to their postpartum urination status in clinical practice [17]. A systematic review of nine articles by Qiaomeg identified episiotomy, epidural analgesia, instrumental delivery, primiparity, and a longer second stage of labor were the independent risk factors for PUR. Episiotomy (OR = 2.99, 95% CI = 1.31-6.79, P = 0.009), epidural analgesia (OR = 2.48, 95% CI = 1.09-5.68, P = 0.03), primiparity (OR = 2.17, 95% CI = 1.06-4.46, P = 0.03), instrumental delivery (OR = 4.01, 95% CI = 1.97-8.18, P < 0.001), and the duration of the second stage of labor (MD = 15.24, 95% CI = 11.20-19.28, P < 0.001). However, fetal birth weights of more than 3800 g were not identified as an independent risk factor (MD = 64.41, 95% CI = -12.59 to 141.41, P = 0.10) [18]. A clinical audit was conducted by Beaumont T on 108 cases with complaints of persistent urinary retention after the delivery of the baby. The study result has shown that in a three-month time period frame, acute urinary retention after delivery of a baby was present in an overall 3.8% of patients retrospectively (n=42/1108), on the other hand, significant bladder over-distension issue was noted in 28.6% of these patients (n=12/42). By doing a urinary catheterization, and usually, by availing time frame of urinary bladder rest, it was identified that 100% of women who failed to micturate first, were later on reviewed and they became capable to micturate successfully when their catheter was removed. In this study, over a time frame of 12 months' duration, it was identified that there were three cases of persistent urinary retention after delivery of the baby and it total represented an incidence of 0.07% (n=3/4353). So, the study has concluded that the already available process of void review after delivery of the baby was a time-tested method that was reliable and fit into our

framework, but if we confirm bladder emptying by the objective statement, then its function and reliability were enhanced further [19]. In our recent study, 30.14 ± 5.06 years was with the mean age of females having minimum and maximum ages as 18 and 40 years. According to the results, 200 (52.2%) females had covert urinary retention while 183 (47.8%) did not. Another study by Kekre also identified the prevalence of covert and overt urinary retention (PUR) after the birth of a baby and it also tells us about different variables which were responsible for this issue. In this study, 84 (10.9%) cases developed urinary retention in total, on further division of these cases, it is shown that 82 (10.6%) patients presented with covert PUR and 2 (0.3%) cases presented with overt PUR and this data was recovered out of the 771 patients inducted in the study. It was also noted that women who delivered vaginally but instrumental forceps or vacuum was used during the delivery process, were more likely to present this disease of PUR (P=0.03), with an Odds Ratio (OR) of 1.194 95% Confidence Interval(CI), 0.56-1.90. A good predictor of PUR was considered a longer time period of labor especially if it exceeds more than 700 minutes [19]. In the current study, the frequency of covert urinary retention was high and also was not related to the status of episiotomy and duration of labour. Like-wise another research was conducted by Groutz A et al., in 2011 [17, 18]. A total of 55 patients with PUR were labeled as a study group. While the control group comprised 110 patients, who did not suffer from PUR. The study result has reported that urinary retention was noted in fifty-five (0.18%) women (41 primiparas, 14 multiparas). When this result was further analyzed, it identified two risk factors that were important and significant obstetrically and were the time span of labor stages i.e. second stage, and method of delivery i.e. assisted vacuum delivery. In this study, thirty-six (65%) patients had reverted back to their normal reflex of micturition within a time period of four to fourteen days while 19 (35%) patients attained normal voiding reflex with a time span of fifteen to twenty-eight days. After 72 hours of delivery, higher postvoid residual urinary volume was linked with higher chances for delayed recovery. A 3-39 months' follow-up was available for forty-eight (87%) patients. Out of these 48 patients, 12 patients developed multiple issues like stress urinary incontinence was observed in five (10.4%) patients, and overactive urinary bladder symptoms were present in four (8.3%) cases. While subjective voiding difficulties were noted in three patients (6.3%); however, upon further evaluation by urodynamic studies, it was noted that no voiding phase abnormalities were observed [18]. In the current study, 225 (66.6%) females had prolonged duration of labour but it didn't have any impact on covert urinary retention. A meta-analysis including 27 studies, conducted by Yin X in 2022 and results demonstrated that labor augmentation, primiparity, manual fundal pressure, perineal hematoma, vulvar edema, the duration of the second stage of labor > 60 min, mediolateral episiotomy, severe perineal tear,

epidural analgesia, forceps delivery, vacuum delivery, and neonatal birth weight > 3,500 g were risk factors for postpartum urinary retention in women with vaginal delivery [19]. Another systematic analysis concluded the same risk factors for post-partum urinary retention [20]. A study by Peru BG concluded that PPVD was a common issue that complicates around 10% of vaginal births. Epidural analgesia, birthweight, operative vaginal birth, and having a previous cesarean delivery were independent risk factors for PPVD. In order to prevent PPVD, more research on PPVD risk factors is needed [21]. In another research by Qurrat Ul Ain, out of 878 women, the overall prevalence of PUR after vaginal delivery was 12.9%, and the prevalence of overt and covert PUR was 1.8% and 11.04% respectively. Risk factors include perineal injury, instrumental delivery, birth weight >3.5kg, and a longer duration of the second stage of labor [22]. In a study conducted by Hosakoppal S out of 8992 women; 195 (2.2%) were identified to have postpartum urinary retention. On multivariate logistic regression analysis, operative vaginal delivery (OR 2.98 95% CI 1.32-6.70) and second-degree or greater perineal laceration (OR 2.83 CI 1.59-5.04) were significantly associated with postpartum urinary retention. The incidence of postpartum urinary retention with a postpartum voiding protocol in place was low [23]. Another research by Degasper C concluded the prevalence of covert PUR was 7.1%. Primiparity and duration of the second stage were linked with higher PVRV and such patients may benefit from a routine ultrasound assessment of post-void residual volume after the birth of a baby [24]. Based on the findings in the scoping review by Chen HT et al., said that catheterization prior to the diagnosis of PUR appears to play a role in preventing the overt and covert nature of PUR and was a safe modality [25]. If we want to improve the incidence of this disease, then we have to take different steps like educating our doctors and nurses so that they stick to protocols, and improve their clinical reasoning, problem-solving skills, and decision-making in such high-risk patients. However, the literature shows some evidence that bladder dysfunction persists if we fail to make a diagnosis and further manage PPUR promptly. [20] To achieve this purpose, we have to do these trials on larger scales involving a multi-disciplinary approach in order to get the actual picture of the whole population.

CONCLUSIONS

After analysing the results of our research, it was concluded that more than half i.e. 52.2% of the females had covert urinary retention. So, close monitoring was essential in females as they may develop infection, neuromuscular damage of bladder. At a later stage in life, bladder dysfunction can be a persistent problem if history of incomplete bladder emptying stays with patient. Nationally accepted definitions and management algorithms for postpartum urinary retention were lacking, and development of such guidelines was essential for both

patient care and research design.

Authors Contribution

Conceptualization: IZ, SZS

Methodology: AZ, NP

Formal analysis: AS, YB

Writing, review and editing: EF, FW

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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