



## DETERMINANTS OF URINARY RETENTION IN POST PARTUM VAGINAL DELIVERY PATIENTS IN A TERTIARY CARE CENTRE- A CROSS SECTIONAL STUDY

### Obstetrics & Gynaecology

|                             |                                                                                                                                                         |
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### ABSTRACT

**Background-** Among females who have undergone vaginal delivery, postpartum urinary retention is common. Many females report difficulty in passing urine in puerperal period. Evaluation of the Post void residual bladder volume is done by ultrasound scan which is a non invasive method to detect urinary retention. Study is done to understand the problem better and risk factor associated with it, so that measures can be taken to improve them. **Method-** A Observational, cross-sectional study was conducted in the department of Obstetrics & Gynaecology in RMCH, Bareilly, Uttar Pradesh, India, for a period of 6 months on 220 women who have delivered vaginally and post-void urine volume was estimated by trans-abdominal ultrasound and cause of urinary retention was evaluated. **Result -** Among 220 women, 24 (10.9%) experienced PUR—20 (9.08%) had covert PUR and 4 (1.82%) had overt PUR. No statistically significant association was found between PUR and parity ( $p=0.56$ ), mode of delivery ( $p=0.23$ ), episiotomy ( $p=0.28$ ), or birth canal injury ( $p=0.77$ ). Women with PUR had longer mean durations in both the first ( $684.55 \pm 103.95$  minutes) and second ( $40.37 \pm 11.48$  minutes) stages of labor compared to those without PUR. **Conclusion:** The incidence of PUR was 10.9%, with covert PUR being more prevalent. While no individual risk factor showed statistical significance, prolonged labor and instrumental delivery were more commonly observed among women with PUR. Early detection and intervention are essential to prevent irreversible bladder dysfunction.

### KEYWORDS

cross sectional study, risk factors, urinary retention, post partum, vaginal delivery.

### INTRODUCTION

Among females who have undergone vaginal delivery, postpartum urinary retention is common. PUR is classified into two types: Covert PUR and overt PUR. The definition of overt PUR which is widely accepted is that Women who cannot urinate spontaneously within 6 hr after natural childbirth or 6 hr after the removal of an indwelling catheter in the case of a cesarean section. The Covert PUR is defined as a post-void residual volume (PVRV) of more than 150 mL after the first spontaneous urination, as measured by an ultra-sound or catheter, which indicates incomplete urination.<sup>1</sup>

In most of the obstetric units, evaluation of the post void residual bladder volume is done by ultrasound scan which is a non invasive method to detect urinary retention.<sup>2</sup> The mechanism of urination is the relaxation of the urethral sphincter and the pelvic floor musculature, with increasing contractions of the detrusor muscle and intra-abdominal pressure. Urination would be restricted by weakness of the detrusor muscle with or without relaxation of the urethra.<sup>3</sup> The pathophysiology of PUR is unclear but multiple factors can be related to the neurological, physiological, and mechanical processes which occurs during pregnancy and vaginal delivery.<sup>4</sup>

The factors increasing the incidence of PUR are the period of gestation and physiological adaptations that occur during pregnancy, which includes increases in bladder capacity, urethral closure pressure, urethral length and urethral pressure. These are the precautions against urinary incontinence in pregnancy.<sup>5</sup> Physical factors leading to the obstruction are peri-urethral and vulvar edema which occurs after childbirth causing obstruction of the bladder outlet, and resulting from over-distention of the bladder and permanent damage to the detrusor. Therefore the physiological adaptations after pregnancy and the trauma owing to vaginal delivery may lead to PUR.<sup>6</sup>

Many females report difficulty in passing urine in puerperal period. This study has been done for understanding of the problem and risk factor associated with it, so that measures can be taken to improve them.

### Aim:

- To assess the risk factors and incidence of urinary retention in women who had vaginal delivery.

### Objectives :

- To determine the incidence urinary retention in women who have

normal or instrumental vaginal delivery

- To assess the factors contributing to urinary retention in post partum period.

### MATERIAL AND METHODS:

After the approval of ethics committee and informed consent from the patient, An Observational, cross-sectional study was conducted for a period of 6 months on 220 women who underwent vaginal delivery with post-partum urinary retention, in Department of Obstetrics and Gynaecology at Rohilkhand medical college and hospital, a tertiary care hospital at Bareilly, UP, India. Trans-abdominal ultrasound was done to calculate the post void residual bladder volume and risk factors for urinary retention were evaluated.

### Inclusion Criteria:

- Normal vaginal delivery
- Instrumental vaginal delivery

### Exclusion Criteria:

- Women who require indwelling catheterization during or after labour for any reason other than acute urinary retention.
- Neurological disorder of spine affecting bladder leading to urinary retention
- History of retention of urine prior to delivery

### Statistical Analysis:

The data collected was entered in Microsoft excel 2007 and was analyzed by using SPSS version 23.0 windows software program. The quantitative data was expressed by mean and standard deviation. The qualitative data was expressed in percentages and the differences between percentages was computed using  $\chi^2$  test or Fischer exact test. P value less than 0.05 was considered statistically significant.

### RESULTS

- Of a total of 220 women examined, 24 (10.9%) had PUR.
- 20 (9.08%) had covert retention
- 4 (1.82%) had overt retention

**Table 1: Distribution of patients according to type of urinary retention, present or absent**

| Post partum urinary retention | Frequency | Cumulative % |
|-------------------------------|-----------|--------------|
| absent                        | 196       | 89.09%       |
| Present                       | 24        | 1.82%        |
| Overt                         | 20        | 9.09%        |
| Covert                        | 4         |              |

|                                                                                                  |                  |                 |            |
|--------------------------------------------------------------------------------------------------|------------------|-----------------|------------|
| total                                                                                            | 220              | 100%            |            |
| Table 2: Relationship of different variables between patients with and without urinary retention |                  |                 |            |
| VARIABLE                                                                                         | PUR<br>n=24      | NO PUR<br>n=196 | P<br>VALUE |
| PARITY                                                                                           |                  |                 | 0.56       |
| PRIMIPAROUS                                                                                      | 14(10.3%)        | 102 (89.7%)     |            |
| MULTIPAROUS                                                                                      | 10 (7.7%)        | 94 (92.3%)      |            |
| MODE OF DELIVERY                                                                                 |                  |                 | 0.23       |
| NORMAL                                                                                           | 17 (8%)          | 159 (92%)       |            |
| ASSISTED                                                                                         | 7 (13.7%)        | 37 (86.3%)      |            |
| EPISIOTOMY                                                                                       |                  |                 | 0.28       |
| PRESENT                                                                                          | 19 (8.4%)        | 171 (91.6%)     |            |
| ABSENT                                                                                           | 5 (13.3%)        | 25 (86.7%)      |            |
| BIRTH CANAL INJURY                                                                               |                  |                 | 0.77       |
| NO                                                                                               | 22 (9%)          | 176 (91%)       |            |
| YES                                                                                              | 2 (9%)           | 20 (91%)        |            |
| Duration of labour in minutes                                                                    |                  |                 |            |
| first stage                                                                                      | 684.55 +- 103.95 | 614.83+-107.21  |            |
| second stage                                                                                     | 40.37+-11.48     | 34.86+- 12.84   |            |

Figure 1: Distribution of patients according to type of urinary retention, present or absent

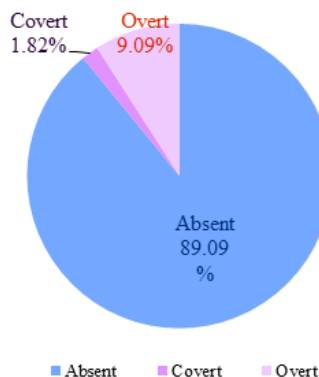
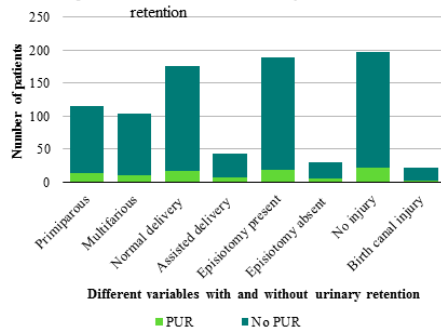


Figure 2: Relationship of different variables between patients with and without urinary retention



## DISCUSSION

Postpartum urinary retention is a relatively common occurrence (with an incidence of (0.7%–1.7%) that often goes unnoticed. Overt retention is easily detected by the signs and symptoms, however, covert retention is recognized only by ultrasound or by catheterization because affected women are asymptomatic. Acute over distension of the bladder can cause ischemic damage to the postsynaptic parasympathetic fibers and can damage the detrusor syncytium. In the present study, the overall incidence of PUR was 10.9%.

In a case-control study, Carley et al.<sup>7</sup> reported that PUR was more common in primigravidae than in multigravidae ( $P<0.001$ ) and that primigravidae had a higher rate of instrumental delivery than did controls (47.1% vs 12.4%); ( $P<0.001$ ). Primigravidae were also more likely to receive regional anesthesia ( $P<0.001$ ) and episiotomy ( $P=0.001$ ).

In a study involving 690 women who had recently given birth, Yip et

al.<sup>8</sup> observed that on the first day after delivery, 4.9% experienced overt urinary retention and 9.7% had covert retention, resulting in a total incidence of 14.6%. Women in the retention group had significantly longer first and second stages of labor ( $P<0.001$ ). The likelihood of overt or covert urinary retention was higher in those who underwent instrumental delivery ( $P<0.001$ ). Similar associations were found with having had previous births (multiparity) ( $P<0.05$ ), receiving epidural anesthesia ( $P<0.001$ ), and undergoing an episiotomy ( $P<0.05$ ). Covert urinary retention resolved on its own and did not require medical treatment.

## CONCLUSION

Postpartum urinary retention can cause irreversible damage to the detrusor muscles and parasympathetic nerve fibers within the bladder wall, which might affect detrusor function. Bladder atony, which occurs secondary to the increased levels of progesterone during pregnancy, and early puerperium might contribute to this damage.

Any delay in diagnosis or missing the diagnosis of overt retention can cause irreversible detrusor damage. Early diagnosis of PUR might facilitate timely intervention. If the woman is unable to void, an indwelling catheter may be used for 48 hours.

In addition, if there is a persistent postvoid residue of more than 150 mL, the patient is advised to undergo intermittent clean catheterization until the residual volume is less than 150 mL.

In summary, covert retention of urine was significantly associated with parturients who had instrumental delivery and a duration of labor of more than 700 minutes. For such women, covert retention might progress to overt retention, leading to detrusor damage.

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