

# Frequency of Post Partum Urinary Retention after Vaginal Delivery

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## ABSTRACT

**Objective:** To determine the factors responsible for postpartum urinary retention after vaginal delivery in women.

**Materials and methods:** This is an observational study conducted in the department of obstetrics and gynecology Rai medical College Sargodha. Study was completed in six months duration from July 2022 to December 2022. Patients undergoing spontaneous vaginal delivery and experienced urinary retention till six hours postpartum were labelled as case of postpartum urinary retention (PPUR). Total 120 cases of PPUR were included in this study after following inclusion and exclusion criteria.

**Results:** Frequency of PPUR after vaginal delivery was 10(8.3%). Main factors causing PPUR include epidural analgesia in 3(37.5%) and prolong duration of labor in 2(25%) cases. Mean age of the study cases was  $27.8 \pm 4.2$  years. Mean gestational age was  $38.12 \pm 2.2$  weeks.

**Practical Implication:** In this study our aim was to assess risk factors developing postpartum urinary retention (PPUR) in women who underwent vaginal delivery in order to identify women with increased risk of developing symptomatic PPUR so that this problem may be noted in post natal care and may be managed properly. There is no previously sufficient data related to this problem in our population so this study will help us to understand the disease burden in our society.

**Conclusion:** Main risk factors of postpartum urinary retention after vaginal delivery include prolonged labor and epidural analgesia.

**Keywords:** Postpartum hemorrhage, Vaginal delivery, Risk factors, Urinary retention, Prolong labor,

## INTRODUCTION

Postpartum urinary retention is a common problem causing morbidity in patients if untreated.<sup>1</sup> It remains undiagnosed frequently with wide incidence rate of 0.5-30%.<sup>2</sup> There are many factors responsible for this condition such as anatomical changes during delivery like descent of urinary bladder due to injury of pelvic floor may disturb normal voiding and cause urinary obstruction and impaired micturition reflex.<sup>3</sup> Its incidence is higher in episiotomy, prolong labor and epidural analgesia.<sup>4</sup> Yip et al in 1997 differentiated PUR into overt and covert so many authors use these terminologies for comparison of the studies.<sup>5</sup> Women unable to void within six hours after delivery are labelled as having overt (symptomatic) PUR. Presence of >150 ml of urine in bladder on ultrasound examination is called covert (asymptomatic) PUR. According to few studies post voidal residual volume becomes normal after few days spontaneously.<sup>6</sup> Exact pathophysiology of PUR is not understood yet but it is considered to be caused by mechanical, neurological and physiological mechanisms happening in postpartum period.<sup>7</sup> In case of late diagnosis urinary tract infection and bladder dysfunction may occur.<sup>8</sup> Recent studies have stated that a single episode of urinary bladder over distention may cause difficulty in micturition in future, renal impairment and recurrent urinary tract infection.<sup>9,10</sup> There is no previously sufficient data related to this problem in our population so in this study our aim was to assess risk factors developing postpartum urinary retention (PPUR) in women who underwent vaginal delivery in order to identify women with increased risk of developing symptomatic PPUR.

## MATERIALS AND METHODS

This is a cross sectional study of observational type conducted in the department of obstetrics and gynecology Rai medical College Sargodha. Study was completed in six months duration from July 2022 to December 2022. Sample size calculated using WHO

sample size calculator. Non probability consecutive sampling technique was used for sample selection. Patients admitted in the study hospital undergoing normal vaginal delivery and experienced urinary retention till six hours postpartum were labelled as case of postpartum urinary retention (PPUR) and included in this study. Those having urinary tract infection or any urinary tract disease, previous surgery of urinary bladder, prolapse of pelvic organs, neurogenic bladder and patients with diabetes mellitus were excluded from this study. A predesigned proforma used for documentation of the data regarding age, parity, BMI, gestational age, mode of delivery, duration of labor, episiotomy, instrumental delivery and use of epidural analgesia. SPSS software (version 20) was used for data analysis. Chi square test was applied on the data. Means and standard deviation determined for quantitative data while frequency and percentages determined for qualitative data. P-value  $\leq 0.05$  was taken statistically significant. Ethical approval was taken from the study institution and informed consent taken from the study cases as well.

## RESULTS

Total 120 cases were studied with the age interval of 15-37 years with mean age  $27.8 \pm 4.2$  years. Mean BMI was  $26.3 \pm 1.9$  kg/m<sup>2</sup>. There were 82(68.3%) females with primiparity and 38(31.7%) with multiparity. Frequency of PPUR after vaginal delivery was 10(8.3%). Main factors causing PPUR include epidural analgesia in 3(37.5%) and prolong duration of labor in 2(25%) cases. Mean gestational age was  $38.12 \pm 2.2$  weeks. Mean duration of labor was  $9.3 \pm 4.7$  hours. Prolong labor and epidural analgesia were main risk factors of PPUR reported in 3(30%) and 4(40%) cases respectively out of total 10 cases with PPUR. There were 82(68.3%) cases with age  $\leq 30$  years and 38(31.7%) with age >30 years. Gestational age was  $\leq 38$  weeks in 75(62.5%) and > 38 weeks in 45(37.5%) cases. Urinary retention was common (80%) in age  $\leq 30$  years and gestational age  $\leq 38$  weeks (70%)

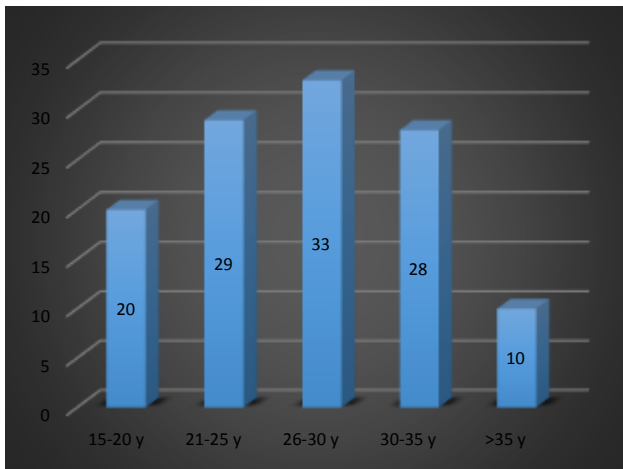
Table-1: Analysis with respect to age of the patients in study group (n=120)

Variables	Total	Age $\leq 30$ years (n=82)		P-value	Age >30 years (n=38)		P-value
		PPUR Yes (N=8)	No (74)		PPUR Yes (N=2)	No (N=36)	
Prolong labor							
Yes	06 (5%)	3 (37.5%)	1 (1.3%)	0.006	0 (0%)	2 (5.5%)	0.91
No	114 (95%)	5 (62.5%)	73 (98.7%)		2 (100%)	34 (94.5%)	

Epidural analgesia							
Yes	15 (12.5%)	3 (37.5%)	7 (9.5%)	0.31	1 (50%)	4 (11%)	0.12
No	105 (87.5)	5 (62.5%)	67 (90.5%)		1 (50%)	32 (89%)	
Primiparity							
Yes	82 (68.3%)	2 (25%)	68 (92%)	0.72	0 (0%)	12 (33.3%)	0.43
No	38 (31.7%)	6 (75%)	6 (8%)		2 (100%)	24 (66.7%)	
Episiotomy							
Yes	69 (57.5%)	2 (25%)	50 (67.6%)	0.87	0 (0%)	17 (47.2%)	0.32
No	51 (42.5%)	6 (75%)	24 (32.4%)		2 (100%)	19 (52.8%)	
Instrument delivery							
Yes	23 (19.2%)	1 (12.5%)	19 (25.6%)	0.65	1 (50%)	2 (5.5%)	0.007
No	97 (80.8%)	7 (87.5%)	55 (74.3%)		1 (50%)	34 (94.5%)	

Table-2: Analysis with respect to gestational age in study cases (n=120)

Variables	Total	Gestational age ≤38 weeks (n=75)		P-value	Gestational age >38 weeks (n=45)		P-value
		PPUR			PPUR		
		Yes(N=7)	No (68)		Yes (N=3)	No (N=42)	
Prolong labor							
Yes	06 (5%)	3 (42.8%)	2 (3%)	0.004	0 (0%)	1 (2.5%)	0.83
No	114 (95%)	4 (57.2%)	66 (97%)		3 (100%)	41 (97.5%)	
Epidural analgesia							
Yes	15 (12.5%)	2 (28.6%)	8 (11.8%)	0.022	1 (33.3%)	4 (9.5%)	0.74
No	105 (87.5)	5 (71.4%)	60 (88.2%)		2 (66.6%)	38 (90.5%)	
Primiparity							
Yes	82 (68.3%)	4 (57%)	46 (67.6%)	0.82	0 (0%)	32 (76.2%)	0.68
No	38 (31.7%)	3 (43%)	22 (32.3%)		3 (100%)	10 (23.8%)	
Episiotomy							
Yes	69 (57.5%)	6 (85.7%)	38 (55.8%)	0.73	0 (0%)	25 (59.5%)	0.56
No	51 (42.5%)	1 (14.3%)	30 (44.2)		3 (100%)	17 (40.5%)	
Instrument delivery							
Yes	23 (19.2%)	5 (71.4%)	15 (22%)	0.005	1 (33.3%)	2 (4.7%)	0.31
No	97 (80.8%)	2 (28.6%)	53 (78%)		2 (66.7%)	40 (95.2%)	



Graph-1: Age distribution in study group (n=120)

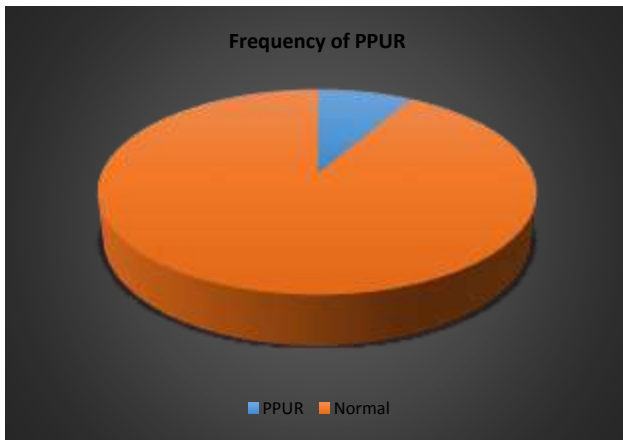


Figure-2: Frequency of post-partum urinary retention in study group

## DISCUSSION

Postpartum retention of urine is a common condition that usually remains undiagnosed leading to complications but if identified in time it has good prognosis.<sup>11</sup> Its incidence is different in various countries ranging from 0.5-51%.<sup>12</sup> Initially PPUR after vaginal delivery was considered a minor problem but later on studies showed its serious complications.<sup>13</sup> There are many factors contributing to this condition like neurological, physiological and mechanical factors. Prolong duration of labor may also cause PPUR. Second and third stages of the labor have increased risk of PPUR but active phase did not cause PPUR.<sup>14</sup> Possible mechanism in prolonged labor is mechanical forces of pelvic muscles causing nerve damage leading to neurological abnormality of the bladder.<sup>15</sup> In our study total 120 cases were studied with the age interval of 15-37 years with mean age  $27.8 \pm 4.2$  years. Mean BMI was  $26.3 \pm 1.9$  kg/m<sup>2</sup>. There were 82(68.3%) females with primiparity and 38(31.7%) with multiparity. Frequency of PPUR after vaginal delivery was 10(8.3%). Main factors causing PPUR include epidural analgesia in 3(37.5%) and prolong duration of labor in 2(25%) cases. Mean gestational age was  $38.12 \pm 2.2$  weeks. Mean duration of labor was  $9.3 \pm 4.7$  hours. Prolong labor and epidural analgesia were main risk factors of PPUR reported in 3(30%) and 4(40%) cases respectively out of total 10 cases with PPUR. Previously a study conducted by Christine in Austria stated that prolonged labor is an important risk factor of PPUR.<sup>16</sup> Instrumental delivery is also a significant risk factor of PPUR causing detrusor muscle injury and tissue edema. In instrumental delivery vacuum and forceps used in vaginal delivery usually cause voiding abnormality due to perineal trauma.<sup>17</sup> In this study PPUR after instrumental delivery happened mostly in age >30 years. Wang et al reported that vacuum assisted delivery causes urethral sphincter injury leading to inability to relax the sphincter hence causing urinary retention.<sup>18</sup> In our study there were 82(68.3%) cases with age ≤30 years and 38(31.7%) with age >30 years. Gestational age was ≤38 weeks in 75(62.5%) and >38 weeks in 45(37.5%) cases. Urinary retention was common (80%) in age ≤30 years and gestational age ≤38 weeks (70%). Episiotomy also impairs urinary bladder functions by disturbance of its sensitivity and central inhibition of bladder. Some studies

suggest that neuraxial anesthesia is associated with PPUR. Many authors have stated association of epidural analgesia with postpartum urinary retention.<sup>19</sup> A study conducted in Vietnam reported incidence of PPUR as 1.2%, frequency of PPUR after episiotomy as 10.8%, urinary incontinence 11.4%.<sup>20</sup> According to a previous study conducted in Netherland by Unique et al reported incidence of PPUR after vaginal delivery 10.9% including 10.6% having covert while 0.3% having overt PPUR. Duration of labor >700 minutes was associated with increased risk of PPUR.<sup>21</sup>

## CONCLUSION

We concluded that incidence of PPUR after vaginal delivery is significantly high if there is prolong labor or epidural analgesia given. So bladder care must be considered during prolong labor and epidural analgesia, in that case early diagnosis and prompt treatment play vital role in preventing complications of PPUR.

**Conflict of interest:** No

**Source of funding:** No

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