

# An Additional Method To Predict Postpartum Urinary Retention After Vaginal Delivery Without Epidural Anesthesia

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## Abstract

**Objective:** We examined whether postpartum urinary retention (PUR) can be predicted by the presence or absence of the spontaneous urination within 2 hours after vaginal delivery (early postpartum urinary retention or anuria, EPURA) at term without epidural anesthesia.

**Methods:** We reviewed the obstetric records of all singleton vaginal deliveries at term at Japanese Red Cross Katsushika Maternity Hospital from January 2014 through December 2015.

**Results:** Of the 2,490 singleton vaginal deliveries at term, EPURA was observed in 253 cases (10.1%), and 60 cases (2.4%) were diagnosed as having PUR. Of the 253 cases with EPURA, 52 cases (20.5%) were complicated by PUR (OR 72.1, 95% CI 34-150,  $p < 0.01$ ). Its sensitivity, specificity and negative predictive value were 0.867, 0.917 and 0.996, respectively.

**Conclusion:** The check of the presence or absence of the spontaneous urination within 2 hours after vaginal delivery may be a useful method to predict PUR after vaginal delivery without epidural anesthesia.

## INTRODUCTION

Postpartum urinary retention (PUR) has been defined as the absence of spontaneous micturition within 6 hours of vaginal delivery with a bladder volume above 400 mL [1]. To date, some risk factors for PUR such as instrumental delivery and perineal lacerations have been reported associated with the occurrence of perineal neuropathy during delivery [1-3]. In our earlier study [3], for example, nulliparity, instrumental delivery and episiotomy seemed to be independent risk factors for PUR after vaginal delivery at term without epidural anesthesia.

In many Japanese facilities, to promote the involution of uterus it has tended to encourage first urination with palpation of the bladder within 2 hours after vaginal delivery [4,5]. At this point, although spontaneous urination has been presented in many cases, occasionally urination cannot be done. Thus, we examined whether PUR can be predicted by the presence or absence of the spontaneous urination within 2 hours after vaginal delivery (early postpartum urinary

retention or anuria, EPURA) at term without epidural anesthesia.

## METHODS

The retrospective study was conducted in Japanese Red Cross Katsushika Maternity Hospital. The protocol for this analysis was approved by the Ethics Committee of the Japanese Red Cross Katsushika Maternity Hospital. In addition, informed consent for the retrospective analyses was obtained from each subject before delivery.

We reviewed the obstetric records of all singleton vaginal deliveries at term at Japanese Red Cross Katsushika Maternity Hospital from January 2014 through December 2015 ( $n = 2,631$ ). Demographic information and the characteristics of labor were extracted from patient charts.

Categorical variables were analyzed by the Pearson chi-square tests. Odds ratios (ORs) and 95% confidence intervals (Cis) were estimated, and  $p$ -values  $< 0.05$  were

considered statistically significant.

## RESULTS

Of the 2,631 singleton vaginal deliveries at term, 141 cases with missing data or cases requiring urethra indwelling catheter for indications other than PUR were excluded. Of the rest 2,490 cases, the absence of spontaneous urination within 2 hours after vaginal delivery (early postpartum urinary retention or anuria, EPURA) was observed in 253 cases (10.1%), and 60 cases (2.4%) were diagnosed as having PUR. Of the 253 cases with EPURA, 52 cases (20.5%) were complicated by PUR (OR 72.1, 95% CI 34-150,  $p < 0.01$ ). Its sensitivity, specificity and negative predictive value were 0.867, 0.917 and 0.996, respectively.

Table 1 shows the influence of the potential risk factors for EPURA and/or PUR after singleton vaginal delivery at term (maternal age, parity, instrumental delivery such as vacuum-extraction and forceps delivery, episiotomy, severe perineal laceration such as third- or fourth-degree laceration, and prolonged labor [1-3]) on the cases of PUR with and without EPURA. These factors seemed to be risks leading to PUR as reported previously [1-3]. In addition, instrumental delivery and episiotomy were risk factors for PUR in cases with EPURA (instrumental delivery: OR 2.59, 95% CI 1.4-4.8,  $p < 0.01$ ; episiotomy: OR 2.35, 95% CI 1.2-4.5,  $p = 0.01$ ).

**Table 1**

Influence of the potential risk factors for EPURA (early postpartum urinary retention or anuria) and/or PUR (postpartum urinary retention) after singleton vaginal delivery.

	EPURA (-)	(+)	(+)
PUR	(-)	(-)	(+)
Total	2,438	201	52
Maternal age $\geq 35$ years	649 (27)	48 (24)	12 (2)
Nulliparity	1,223 (50)	139 (62)*	42 (82)*
Instrumental delivery	336 (14)	50 (25)*	24 (46)**
Episiotomy	938 (39)	103 (51)*	37 (71)**
Severe perineal laceration	32 (1)	7 (4)*	5 (9)*
Prolonged labor	51 (2)	6 (3)	2 (4)

EPURA, early postpartum urinary retention or anuria.

PUR, postpartum urinary retention.

Data are presented as number (percentage).

\* $p < 0.05$  vs. cases without EPURA or PUR.

\*\* $p < 0.05$  vs. cases with EPURA without PUR.

## DISCUSSION

Based on the current results, the presence of EPURA is a predictive factor for PUR, especially in cases of instrumental delivery with episiotomy. To date, the various risk factors and multiple prognostic factors in one woman have been thought to result in an increased risk of PUR although little had been known about postpartum pathophysiology and management for PUR [1,2]. However, the predicting and early diagnosis of PUR is essential because early management such as catheterization is obviously essential in the case of PUR. It has been reported to be usually recovered within 72 hours by treatments consists on catheterization; however, an unnoticed of the situation with inadequate care may lead to the adverse prognosis such as persistent urinary retention [1].

We understand the small sample size of the current observation. However, the check of the presence or absence of the spontaneous urination within 2 hours after vaginal delivery may be a useful method to predict PUR after vaginal delivery without epidural anesthesia.

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