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Relationship between the Urinary Bladder Capacity with the Incidence of Urinary Retention in Postpartum Physiological Mother

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Abstract

The period of pregnancy and postpartum lead to changes in the hormonal system. Such changes affect bladder function including increased capacity and decreased muscle tone of the bladder, resulting in bladder muscle hypotonia. On condition of hypotonia, bulging bladder filled up with urine without curiosity urination, other than when the mother completed voiding residual urine that there is still quite a lot. The bladder needs to be emptied every 4-6 hours to avoid overstretching, further complications such as rupture of the bladder, because of urinary retention may occur in less than 24 hours postpartum. Objective: knowing relationship between urinary bladder capacity with urinary retention incidence in postpartum physiological mother. The study was observational with cross sectional design. The population were all phisiological postpartum mothers treated in Anutapura Palu hospital. Sampling technique using the simple random sampling with sample size of 36 respondents. The independent variabel were capacity of the urine bladder and dependent variabel was urinary retention. Data were analyzed using Chi-square test ($\alpha = 0.05$).

The majority of phisiological postpartum mothers have urinary bladder capacity more than 500 ml (61.1%), and 50% of the group experienced urinary retention. There are 38.9% of postpartum mothers having urinary bladder capacity less than or equal to 500 ml and none had urinary retention. The results of Chi-Square test analysis obtained by value Relative Risk (RR) of 2.00; = 95% CI: 1.32 to 3.04 means that the postpartum mothers with normal urinary bladder capacity have 2 times greater risk of experiencing urinary retention than women with urinary bladder capacity less than or equal to 500 ml and p-value value obtained is $p = 0.002$ ($\alpha < 0.05$).

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In conclusions we ca say that there is a relationship in urinary bladder capacity at phisiological postpartum mothers with the incidence of urinary retention. Urinary bladder capacity more than 500 ml increased risk of physiologi postpartum 2 times more likely to develop urinary retention. So necessary to measure the residual urine volume in each postpartum mothers regularly to find out sooner their urinary retention after vaginal delivery and management done right and fast.

Keywords: The Urinary Bladder Capacity; Urinary Retention; Normaly Postpartum.

1. Introduction

During pregnancy the urinary tractus experienced changes both anatomical and physiological. These changes can be a pathologic condition that affects the development of the fetus and the mother's condition. The condition can be persistent even though the pregnancy has long ended. Those changes may take place in the urethra, bladder, ureter and kidney [1].

Some pathologic condition that occurs is a urinary tractus infection, can occur even acute renal failure [2]. Another change that occurred is urgency, frequency, nocturia, urinary incontinence and urinary retention [1].

During pregnancy and postpartum bladder undergo changes caused by hormonal factors, in this case the increased capacity and decreased muscle tone of the bladder. The increase in urinary bladder capacity coincided with a decrease in muscle tone of the bladder, so the bladder muscles experience hypotonia and bulging bladder filled up with urine without feeling wanted to urinate. As a result of this situation, if the patient has finished urinating, there is still considerable residual urine. The bladder needs to be emptied every 4-6 hours to avoid overstretching; sistisis and pyelonephritis even avoid further complications such as rupture of the bladder. Spontaneous urination after childbirth can wait until the first 24 hours. In other words, urinary retention after delivery can occur 24 hours after childbirth without pain or desire to urinate, urinary retention may occur in less than 24 hours after childbirth with pain and desire to urinate but the patient cannot urinate spontaneously [3] , The greater the capacity of the bladder, the greater the possibility of occurrence of urinary retention. Residual urine volume will also increase in cases with large urinary bladder capacity and will require appropriate counter measures so that no maternal morbidity and mortality. Postpartum urinary retention can be caused neither by a single factor nor by multifactorial, such as psychological, physiological, farmakalogis, and pathology. Vaginal delivery is a risk factor for the occurrence of postpartum urinary retention or development of urinary retention after delivery at a later date. In the United States, labor with the help of tools and the use of regional anesthesia is the most dominant factor that triggered the occurrence of urinary retention [5,6].

Reference [7] conducted a retrospective study on 11 332 women who delivered vaginally starting from August 1992 until April 2000 at the Mayo Clinic Rochester, United States. Obtained 51 (0.45%) mothers who experience postpartum urinary retention. Most who experience postpartum urinary retention is primipara (66.7%) and in cases that require aid in vaginal delivery gained 47.7% experienced postpartum urinary retention. 89 % of the group who get postpartum urinary retention using regional anesthesia and 39.2% of the group performed mediolateral episiotomy [7] .

Reference [5] at the Chang Gung Memorial Hospital in Taiwan conducted research on 2,866 women who delivered vaginally and found 114 women with urinary retention. In women who experience urinary retention found no significant correlation with gestational age, fetal head circle and fetal weight. Things have a significant relationship with the occurrence of urinary retention is the length of labor, tools of labor, damage to the vagina and perineum. Reference [8] reported on the 183 mothers and 82 normal postpartum maternal postpartum vacuum extraction. The incidence of urinary retention in normal labor group 10.4% and 31.7% vacuum extraction group. Urinary bladder capacity and residual urine volume was greater in mothers who undergo catheterization intrapartum and directly proportional to the time the second stage.

The mean urinary bladder capacity, normal labor group 503.44 ± 122.382 ml, while the vacuum extraction 653.60 ± 274.592 ml. The mean volume of residual urine normal labor group 104.26 ± 104.454 ml while the vacuum extraction 269.02 ± 364.369 ml. In Central Sulawesi Indonesia, especially in the General Hospital Anutapura Palu as one of the main referral hospital in Central Sulawesi, clinically incidence of urinary retention in the mother after delivery is not rare, but the incidence cannot be known with certainty because it had never done research on the relationship magnitude the capacity of the bladder and urinary retention incidence in women after childbirth, as well as similar studies. Similarly, the incidence of urinary retention has been no data have been reported in hospital records.

2. Methods

This study is an observational study with cross sectional design. The experiment was conducted at postpartum room of Anutapura general hospital with the average number of normal deliveries reached 75-80 deliveries / month. The research was conducted in June-July, 2012.

The target of population was all phisiological postpartum mothers, being affordable populations are phisiological postpartum mother in childbed room General Hospital of Anutapura Palu.

The sample selection based on inclusion criteria as follows: 37-42 weeks gestational age, birth weight infants with ≥2500 grams, primiparous or multiparous with a history of normal delivery, post-delivery 6 hours, a single childbirth. The sampling technique using simple random sampling with a sample size of 36 people. The research instrument used is the Folley catheter number 16, observasi sheet, measuring cups capacity of 1000 ml, and 0.9% NaCl fluid.

Data collection techniques by observation using partograf labor, urinary bladder capacity was measured by filling the bladder with 0.9% NaCl to feel the sensation of urination and suprapubic pain or the patient told to urinate spontaneously after the catheterization to obtain residual urine volume. While postpartum urinary retention was evaluated by observation through the measure residual urine catheterization outcome after spontaneous voiding mother. Urinary retention is said to occur when the amount of urine> 200 ml.

Data were analyzed by Chi-Square test at Confident Interval (CI) of 95% and $\alpha = 0.05$ to assess the relative risk (RR).

3. Discussion and Results

3.1 Univariate analysis

Table 1: Distribution of phisioliogical postpartum mother according urinary bladder capacity and incidence of urinary retention in the postpartum room of Anutapura General Hospital Palu, 2012

Characteristic		f (n=36)	%
Urinary bladder capacity (ml)	≤500	14	38,9
	>500	22	61,1
Urinary Retention	No	25	69,4
	Yes	11	30,6

Table 1 shows that 36 phisiological postpartum mothers who have urinary bladder capacity > 500 ml as many as 22 people (61.1%) and there were 11 (30.6%) of them suffered urinary retention.

Table 2: Average urinary bladder capacity of Phisiological Postpartum mother in General Hospital of Anutapura Palu.

Variable	N	Minimum	Maximum	Average
Urinary bladder capacity (ml)		400	1250	627,86
No Retention	25	400	800	535,32
Retention	11	600	1250	838,18

Table 2 looked there were 11 phisiological mothers who suffered postpartum urinary retention, average urinary bladder capacity of 838.18 ml where the minimum value is 600 ml and the maximum is 1250 ml. While 25 mothers did not experience urinary retention, average urinary bladder capacity of 535.32 ml, which is a minimum of 400 ml and the maximum is 800 ml. The mean urinary bladder capacity in the whole sample was 627.86 ml.

3.2 Bivariat Analysis

Bivariate analysis about relationship urinary bladder capacity and urinary retention Events was showed at table 3.

Table 3: Relationship of Urinary bladder capacity and Urinary retention in General Hospital of Anutapura Palu, in 2012

		Urinary Retention		RR	CI 95%	X^2_h	*p-value*	Fisher exact
		No (%)	Yes (%)					
Urinary bladder capacity (ml)	**≤ 500**	14 (100)	0 (0)	2,0	1,32 – 3,04	10,08	0,001	0,002
	> 500	11 (50)	11 (50)					

Table 3 shows that the relationship urinary bladder capacity of 36 mothers in 6 hours pospartum with urinary retention were 22 people by urinary bladder capacity > 500 ml and 11 (50%) of them suffered urinary retention. Based on Chi-Square test analysis values obtained Relativ Risk (RR) of 2.00 in the Confidence Interval (CI = 95%) from 1.32 to 3.04 with a p-value = 0.001, then the correction with the Fisher exact test values obtained p = 0.002 where this value < α (0.05), meaning there is a magnitude of urinary bladder capacity to phisiological postpartum mothers with the incidence of urinary retention.

3.3 Discussion

The amount of Urinary bladder capacity

The results of study show that 61.1% of mothers had normal postpartum urinary bladder capacity > 500 ml. These results are also supported by an increase in mean urinary bladder capacity 6 hours postpartum mother is 627.86 ml. In the experienced group a mean urinary retention in urinary bladder capacity greater is 838.18 ml, whereas in the group that did not experience urinary retention mean urinary bladder capacity was 535.32 ml. Chi-Square test results illustrate that the value of p = 0.001, then corrected with the Fisher exact test p value = 0.002 where the value is <0.05, which means that statistically there is a correlation magnitude urinary bladder capacity, postpartum mothers with normal incidence of urinary retention.

The capacity of the bladder during childbirth will increase and larger than the capacity beyond pregnancy. The theory show an increase in urinary bladder capacity is due to detrusor muscle hypotonia due to the influence of progesterone, the detrusor muscle hypertrophy due to the increased influence of the estrogen hormone. Besides, the bladder is also relatively less sensitive to pressure intravesikal so most patients can hold urine in large numbers for a moment without curiosity urinate and had no difficulty in spending which led to increased urinary bladder capacity that can exceed 1 liter [1] . The theory is consistent with the above results are getting an increased amount of normal urinary bladder capacity postpartum mothers. Even in the group mean urinary retention seen in urinary bladder capacity of 838.18 ml, with a maximum value of 1250 ml, far greater than the capacity of the bladder outside the mother's pregnancy is assumed ≤ 500 ml.

The magnitude relationship urinary bladder capacity and urinary retention shows that there are 61.1% of mothers had phisiological postpartum urinary bladder capacity > 500 ml, and 50% of the group experienced urinary retention. While the group of mothers who have urinary bladder capacity ≤ 500 ml only 38.8% and none had urinary retention. It is seen that the whole incidence of urinary retention occurred in women with urinary bladder capacity > 500 ml.

The results of this study indicate a relationship the amount of Urinary bladder capacity mother in 6 hours postpartum phisiology with postpartum urinary retention. Chi-Square analysis test show that value in Relative Risk (RR) of 2.00; = 95% CI: 1.32 to 3.04 means that the postpartum mothers with normal urinary bladder capacity > 500 ml 2 times greater risk of experiencing urinary retention than women with urinary bladder capacity ≤ 500 ml, where the incidence of urinary retention occurs only in women with urinary bladder capacity > 500 ml. This shows the significance in the clinic, where the value of RR > 1 and is in the range of CI does not exceed 1, likewise shows the significance statistically with p-value is corrected by the Fisher exact test p-value = 0.002 where this value <α (0, 05).

This study is consistent with the results [8] found the incidence of urinary retention normal postpartum mothers was 10.4% and the average of urinary bladder capacity in phisiological postpartum mother was 503.44 ± 122.382 ml, and there is difference between groups in urinary bladder capacity urinary retention (665.79 ± 215.29 ml) with no urinary retention group (484.63 ± 90.424 ml) and the difference was statistically significant (p <0.05). Similarly, reference [10] [reported] on 164 women with risk of urinary retention after delivery, gained 11% had urinary retention, were [7] at the Mayo Clinic Rochester, USA, examined 11 332 women who gave birth vaginally, 51 (0.45%) mothers experience postpartum urinary retention.

According [9] one of the causes of postpartum urinary retention is hypotonia during pregnancy and childbirth. The situation is causing an increase in urinary bladder capacity. The results showed that all the events of urinary retention occurs when a woman with urinary bladder capacity > 500 ml. According to the statistical test is meaningful relationship in which the p value = 0.002.

4. Conclusion

There is a correlation urinary bladder capacity in 6 hours phisiological postpartum to urinary retention, meaning urinary bladder capacity in phisiological postpartum mother > 500 ml give risk 2 times more likely to develop urinary retention than women with urinary bladder capacity ≤ 500 ml.

5. Suggestion

a. The residual urine volume measurement can be used as a routine for women who have risk factors for urinary retention early to know their urinary retention after vaginal delivery.

b. More representative number of samples required a larger, because it needs no further study with a broader scope.

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