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## The Influence of Bladder Training Initiation on Residual Urine in the Stroke Patients with Urine Catheter

Wahyu Hidayati<sup>1</sup>

**Background:** The stroke patients usually experience with various dysfunction, including disturbance in elimination because of neurogenic bladder. Urine residue can be used to detect the bladder function in contracting and voiding urine.

**Purpose:** This research aimed to compare bladder training initiation after stroke patients after the patients passed the acute phase and one day before the urine catheter was removed.

**Method:** This research was quasy experimental study posttest-only design with a comparison group design. The sample in this research was taken by purposive random sampling method. The residual urine was measured with bladder scan and was recorded in the observation sheet.

**Result:** The mean volume of the residual urine in the treatment group was less (M= 54,00 ml; SD= 144,22 ml) if compared with the residual urine volume in the control group (M= 101,71 ml; SD=42,55 ml). The mean differences of bladder training both in the treatment and the control groups which was analyzed with *t*-test independent, there wes no differences between residual urine volume in both groups ( $p= 0,84$ ).

**Conclusion:** Therefore, the health institution should consider developing the system and made a procedure in bladder training program. The nurse also should prever bladder training before the urine catheter was removal.

**Keywords:** bladder training, stroke patient, residual urine

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## **Background**

Stroke is a neurological deficit that has suddenly and lasts awitan within 24 hours as a result of CVD (cerebrovascular diseases) (Hudak & Gallo, 1996). catastrophic stroke or brain blood flow (brain attack / brain attack), can trigger the occurrence of disability (disability) and the main invaliditas in the age group over 45 years. A stroke is divided into two categories: ischemic stroke and hemorrhagic stroke. The longer the blood supply cut off would make a lot of brain cells become damaged, so the longer a stroke patient does not get help, then the risk of death even higher. Central Java Provincial Health Office in 2005 cases of stroke are highest in the city of Semarang that is equal to 4516 (17.36%) than overall stroke cases in the districts of other cities in Central Java. Stroke patients usually experience various kinds of dysfunction, depending on the location of damage in the brain including urinary and fecal elimination disorders (Hudak & Gallo, 1996).

Nervous system that affects the person's ability of to urinate normally due to the integrated activity of the autonomic nervous system and somatic. Jaras neural consisting of various reflex detrusor and sphincter function of the frontal lobe extends into the sacral spinal cord, so that lesions in various degrees in this jaras cause neurogenic bladder disorder / neurogenic bladders (Japardi, Manifestation of Neurological Disorders Miksi, 2002). Stroke patients who experience urinary incontinence, caused by nerves to send signals of filling of the bladder, but the brain can not interpret and respond to it (because of the damage in the brain) so that the bladder can not empty the bladder (Black & Hawk, 2005; Kozier & Erb, 2004). Patients can not feel her bladder was full and / or patient can not control the urinary sphincter due to neurogenic bladder or because the patient experienced a decrease of consciousness (Black & Hawk, 2005; Kozier & Erb, 2004).

Management of urinary incontinence stroke patients with indwelling catheter placement action, or intermittent catheter, or use a condom catheter / pampers. Indwelling catheter placement performed to overcome incontinence in the acute phase of stroke patients, and help stroke patients avoid a full bladder (Christensen & Kockrow, 2005). However, the use of the catheter resulted in the emergence of a sustainable neurogenic bladder, detrusor instability or urinary tract infection. Actions taken to minimize the impact of catheterization with catheter care from start installation until the catheter is removed. Includes preparation needs to be done by nurses when it comes to removing the catheter is to apply the bladder training in patients (Black & Hawks, 2005; Kozier & Erb, 2005; Hickey, 2003; Fillingham & Dauglas, 2000).

Bladder training is an exercise done on the bladder by controlling urine output (Ellis & Nowlis, 1994). Bladder training should be done since the installation of the catheter, the method mentioned by Ellis and Nowlis (1994) as a “clamp and release”. It is expected that the patient will feel diklemnya catheter into her bladder is full, so the desire to spend kecing memuncul. This method should be routinely performed before catheter is removed, so that the system will continue to be trained detrusor patients (Ellis & Nowlis, 1994; Fillingham & Dauglas, 2000). In stroke patients, bladder training should be done immediately after passing through the acute phase after a stroke (Hudak & Gallo, 1996; Christensen & Kockrow, 2005).

Several studies have linked the incidence of stroke and incontinence are many available, but still limited research that discusses stroke patients using a catheter and baldder his training. Research effectiveness of bladders of patients with mixed incontinence, other studies on Impact Modification Using Bladder training Kozier mode, but investigators have not found research that describes the effectiveness of the actions bladder training in stroke patients. Recommendations from the research Duncan, et al (2005), one of which is to improve the quality of life of stroke patients is bladder training program in patients with urinary incontinence and use of bladder scan is highly recommended in the evaluation of voiding ability of patients (Roe, 1990, in Macaulay, 2000)

Hudak and Gallo (1996) catheters in patients with stroke should be immediately released. According Cristensen and Kockrow (2005) Clinical pathways in stroke patients, after passing through the acute phase (days 2-3 post-stroke) patients are recommended to follow the rehabilitation, including rehabilitation bladder. This is done to prevent complications of catheter placement. Interviews with nurses in the neurology ward, that stroke patients who had been given bladder training one day before the release of different catheter success rate, viewed from within the patient's ability to urinate completely. Differences in the ability to urinate can be seen from there are some patients who can urinate completely, there are patients who can not urinate completely and some patients still experience urinary incontinence, but it is not known how the residual urine.

## **Objectives**

The purpose of this study was to determine the difference effect of bladder training is done after the acute phase of stroke patients with bladder through traning one

day before the catheter was removed at a stroke patient who inserted the catheter in neurological ward.

## **Method**

### *Design*

This study used design experiment quasy post-test-only design with a comparison group. Treatment group given preferential treatment in the form of Bladder training conducted since the patient through the acute phase, while the control group treated Bladder training nurses are wont to do, namely from the day before the catheter is removed. Once training is completed Bladder and urinary catheters removed, the respondents in treatment and control groups were evaluated residual urine in the bladder using a bladder scan, after the patient's bladder filled and micturition.

### *Population and sample*

The population in this study were all stroke patients with urinary catheters who were treated in neurology ward at dr. Kariadi hospital. Patients become the research sample if they meet inclusion criteria, and treated in the neurology ward within the period 21 April to 7 June 2008. The inclusion criteria used in this research is: never complain / have never been treated and treated for urinary disorders, are not susceptible to interference persyarafan spinal cord, stroke patients are fitted with a catheter which has stable condition: GCS> 10, blood pressure, respiration and pulse: stable, no brain stem disorder, has allowed doctors to drink with free / not limited to, approved doctors to do bladder training, willing to be respondents of the study. Sampling was purposive sampling method and were randomly selected. However, during the research process within 1.5 months only 14 patients found that match the inclusion criteria and divided by 2 (respectively groups of seven respondents).

## **Result**

The result of study (Table 1) shown that the male sex (treatment group) at most of 4 (57%) and control group sample sex most women who are 4 people (57%). The average age in the treatment group showed the age of 60.29 years with a standard deviation of 11.63 years. Youngest age of 46 years and the oldest 78 years, the average age in the

control group was 58.57 years (standard deviation 14.39 years), age of the youngest and the oldest 40 years old 76 years old.

Table 1

*The characteristic of respondents in treatment and control group (N=14)*

| No. | Variable               | Treatment group |      | Control group |      |
|-----|------------------------|-----------------|------|---------------|------|
|     |                        | n               | %    | n             | %    |
| 1.  | Sex :                  |                 |      |               |      |
|     | a. Male                | 4               | 57,1 | 3             | 42,9 |
|     | b. Female              | 3               | 42,9 | 4             | 57,1 |
| 2.  | Age                    |                 |      |               |      |
|     | a. < 60 years old      | 4               | 57,1 | 4             | 57,1 |
|     | b. Ages ≥ 60 years old | 3               | 42,9 | 3             | 42,9 |
| 3.  | Urine Residue          |                 |      |               |      |
|     | a. ≤ 100 ml (normal)   | 6               | 85,7 | 5             | 71,4 |
|     | b. > 100 ml (abnormal) | 1               | 14,3 | 2             | 28,6 |

The average amount of residual urine treatment groups amounted to 44.43 ml (SD = 44.54 ml) and the control group average residual urine volume of 111.29 ml (SD = 139.09 ml). After doing bladder training in group treatment, patients showed residual urine volume ≤ 100 ml of 6 people (85.7%), the control group showed that the patients showed results ≤ 100 ml urine residue after bladder training has 5 patients (71.4%), (see table 2).

Table 2

*The mean, standar deviation, and confidence interval of ages and vomlume residual urine between two groups*

| Variable             | Mean<br>Median  | Standar<br>Deviasi | Min-max | 95% CI        |
|----------------------|-----------------|--------------------|---------|---------------|
| Ages                 |                 |                    |         |               |
| a. Treatment group   | 60,29<br>58,00  | 11,63              | 46-78   | 49,53-71,04   |
| b. Control group     | 58,57<br>52,00  | 14,39              | 40-76   | 45,26-71,89   |
| Volume urine residue |                 |                    |         |               |
| a. Treatment group   | 44,43<br>34,00  | 44,54              | 4-119   | 3,23-85,63    |
| b. Control group     | 111,29<br>48,00 | 139,09             | 5-324   | -17,35-239,93 |

Tabel 3 shows the results of Fisher's test on cross-tabulation between sex with a volume of residual urine in the treatment group showed results of 0.429 and p value obtained in the control group p value was 0.286. The  $p$ -value of the two groups of  $> 0.05$ . The  $p$ -value of the two groups were 0.05. respondents in the treatment group aged  $\geq 60$  years were 33.3%) patients with residual urine  $> 100$  ml. Fisher's exact test results on the cross tabulation between age and residual urine volume in treatment group p value of 0.429 and p value for the control group was 0.143 (p value  $> 0.05$ ).

Table 3

*Cross Tabulation of confounding variables (sex and age) with a volume of residual urine after catheter Released on Treatment Group and Control Group (N = 14)*

| Variable            | Treatment     |           |        | Kontrol       |           |        |
|---------------------|---------------|-----------|--------|---------------|-----------|--------|
|                     | $\leq 100$ ml | $>100$ ml | TOTAL  | $\leq 100$ ml | $>100$ ml | TOTAL  |
|                     | n (%)         | n (%)     | n (%)  | n (%)         | n (%)     | n (%)  |
| Male                | 2(66,7)       | 1(33,3)   | 3(100) | 3 (75)        | 1(25)     | 4(100) |
| Female              | 4(100)        | 0(0)      | 4(100) | 2(66,7)       | 1(33,3)   | 3(100) |
| <b>p Value</b>      |               | 0,429     |        |               | 0,286     |        |
| < 60 years old      | 4(100)        | 0(0)      | 4(100) | 2(50)         | 2(50)     | 4(100) |
| $\geq 60$ years old | 2(66,7)       | 1(33,3)   | 3(100) | 3(100)        | 0(0)      | 3(100) |
| <b>p value</b>      |               | 0,429     |        |               | 0,143     |        |

Surprisingly, the analysis of residual urine in the treatment group (54.00 ml with standard deviation 144.22 mL) was less if compared with the control group (101.71 ml with a standard deviation of 42.55 ml). The results of independent  $t$ -test showed there was no significance difference in residual urine volume in the treatment group and in the control group ( $p > 0.05$ ), after bladder training be done. Either, on the respondent through the acute phase as well as bladder training is done or one day before the catheter is removed.

## Discussion

### *Relationship Between Sex with Residual Urine Volume*

General description of the cross table confounding variables (gender and residual urine volume), seen in quantity in the treatment group there was only 1 patient (33.3%) who had residual urine  $> 100$  ml and male sex. The Analyzed further 1 patient who had urine residual volume in the treatment group was 119 ml ( $> 100$  ml). In the control group urine residual volume  $> 100$  ml was found in 1 person respondent-sex male and female 1 person.



Settings detrusor fibers in the bladder neck area is different in men and women, men have a distribution of circular fibers and these fibers form a sphincter of the bladder neck is effective to prevent the occurrence of retrograde ejaculation. Urethral sphincter (rhabdosphincter) consists of circular striated muscle fibers, which in men rhabdosphincter located right in front of the distal prostate, whereas in women around almost the entire urethra. Rhabdosphincter anatomically distinct from the muscles that form the pelvic floor (Japardi, 2002). Black and Hawks (2005) says that men with more than 40 years of age often occurs BPH and can hamper urine output, whereas in women other than the detrusor muscle anatomy can also be influenced by a history of pregnancy and hormone estrogen.

The presence of tumor is an urgent bladder or urethra earnest disrupt the process of voiding a person (of BPH or myomas). Also cans Neurological conditions affect the patient, Because after the results of CT-SCAN these pengecekan Patients, seen the results of a rather extensive infarction in the cortex. These cortical regions have in Addition to the central nervous system, that pons regulate the process of micturition. P value > 0.05, indicating no linkage Between sex with residual urine. This cans Happen Because there are factors That Affect the residual urine in this study not be detected cans Because there are diagnostic tests to see the condition of stroke Patients are still not done, Such as EEG, cystoscopy, abdominal ultrasound, plain abdominal images, and others.

#### *Age Relations with Urine Residue volume in Treatment Group and Control Group*

Structural and functional changes of the bladder in the elderly may inhibit emptying the bladder completely. The cause of this condition is due to the addition of age, anatomy of the bladder becomes more funnel, which is the result of a change in the connective tissue and pelvic muscles are weakened. Kemihpun become increasingly irritable bladder, thereby increasing urgency in urination. Detrusor muscle also becomes more difficult to elongate resulting in decreased contractility of the bladder and reduced bladder capacity. (Black and Hawks, 2005). National Institute on Aging says that age is not a cause of incontinence, but more associated because of other causes, including the urinary tract and vaginal infections, and neurological disorders. (Urinary Incontinence, 2002, retrieved from <http://www.nia.nih.gov>, dated January 20, 2008). Research by Fantl et al on the Efficacy of bladder training in older women with urinary incontinence, the result of 57% reduction in episodes of incontinence with behavioral therapy (1991, in Rovner et.al., 2002. [Http://www.cielo.br/img /. mht](http://www.cielo.br/img /. mht) February 1, 2008). Research was



conducted on elderly women and bladder training in the form of behavioral therapy has succeeded quite well reduce the incidence of incontinence. Fisher's test results on the treatment group p value > 0.05 so that it can be concluded that there was no significant difference between age and residual urine, both in the control group and treatment group in this study. This can be caused by age is not the only factor associated with the volume of residual urine.

#### *Residual Urine Difference Between Treatment Group and Control Group*

Looking at data from the study between treatment and control groups, from 14 stroke patients who performed well bladder training conducted since the acute phase and one day before the catheter was removed, who had residual urine >100 ml there were 3 patients. This volume of residual urine was smaller than the normal patient urine residue, so that both types of bladder training with a different prefix starting time to produce the majority of patients had residual urine  $\leq 100$  ml (normal). The result viewed that the value of statistical tests have shown there was no significant difference between the two types of bladder training. This result was consistent to the concepts involved, if catheterization walk in the long term, then bladder training also needs a long time during the patient inserted a catheter (Smeltzer & Bare, 2004). In the other citation was also suggest that bladder training on short-term catheterization (up to six days) is useful to restore micturition pattern (Roe, 1990, in Macaulay, 2000).

There was no significant difference between the bladder training after the respondents with bladder training through the acute phase with bladder training one day before the catheter was removed in stroke patients, it can be caused by many factors. These factors include the initial conditions of stroke patients who can not fully known, thus varying the conditions the end result is also difficult to predict. For example, the location of cerebral damage at stroke patient, it could not predict to the extent of neurons damage and the occurrence of stroke involution. Residual urine volume when the patient before the catheter can not be obtained fitted the data, because patients get immediate first aid in the ER form of catheter placement, early detection can not be done because there is no tool Bladder scan on the unit. Another factor is the small sample size (N=14) was for both groups may affect the calculation of the statististik. The condition of stroke patients who may experience worsening during treatment, it made some respondents dropped out; therefore, the number of respondents decreased at any time. Based on several studies of

micturition disorders in stroke patients shows that it takes a larger sample size of about 37-250 patients in the study period of 6 months - 1 year, although researchers have not found the same research study.

### **Conclusion**

The average amount of residual urine for smaller groups of treatment that is equal to 44.43 ml, whereas for the control group the average number of 111.29 ml urine residue after the initiation of bladder training. Confounding varabel Analysis showed no significant relationship between gender and age with the amount of residual urine in both the control and treatment groups (p value > 0.05). There was no significant difference between treatment groups conducted training bladders from patients through the acute phase with the control group who performed bladder training the day before the catheter is removed. Effect of bladder training in the treatment group conducted training bladders from patients through the acute phase of visible residual urine respondents on average 54.00 ml (standard deviation 144.22 mL) of less than 100 ml.

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