



RESEARCH ARTICLE

FACTORS ASSOCIATED WITH THE LENGTH OF STAY IN HOSPITAL OF BENIGN PROSTATIC HYPERPLASIA (BPH) PATIENT WHO UNDERGO TRANSURETHRAL RESECTION OF PROSTATE (TURP) SURGERY AT WEST NUSA TENGGARA PROVINCE GENERAL HOSPITAL MATARAM IN 2012-2017

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ABSTRACT

Background: Benign Prostatic Hyperplasia (BPH) is the most common benign tumor that occurs in elderly men. Complaints of BPH patients are mostly in the form of lower urinary tract symptoms (LUTS). TURP is the gold standard surgical procedure in BPH patients. LUTS that are suffered by patients is related to the high cost of personal and community medicine. Length of stay is one of the sources of treatment costs. It needs further investigation regarding the factors associated with the length of stay so that patient care can be more effective and efficient.

Method: This research is a descriptive-analytic study with a cross-sectional design. A total of 173 BPH patients who fulfilled the inclusion and exclusion criteria were examined based on age, prostate volume, length of stay, comorbidities, and complications of surgery. Analysis of bivariate correlation was performed using the Spearman and Contingency Coefficients correlation test according to variable data scales.

Results: From 173 patients, the average age was 65.55 years, the average prostate volume was 72.44 ml with the majority of patients in the grade III category (40.46%), and the average length of stay for 6.27 days. 80.9% of patients had concomitant diseases, 54.34% of patients had bleeding complications, and no patients had TUR syndrome. Correlation test showed no significant relationship between length of stay and age ($p = 0.663$); prostate volume ($p = 0.910$); hypertensive comorbidities ($p = 0.775$), CAD ($p = 0.459$), hypertension and DM ($p = 0.661$), hypertension and CAD ($p = 0.251$); and complications of surgical bleeding ($p = 0.715$).

Conclusions: There was no association between age, prostate volume, comorbidities, and surgical complications with the length of stay in BPH patients who underwent TURP surgery at West Nusa Tenggara Province General Hospital Mataram in 2012-2017.

Keyword: Length of stay, BPH, TURP

Introduction

Benign prostatic hyperplasia (BPH) is the most common benign tumor in the elderly.

The incidence increases with age. The prevalence is 20% in the 41-50 age group, 50% in the 51-60 age group, and > 90% in the age group over 80 years old. The exact incidence

of BPH in Indonesia had never been studied. As a representation, 3,804 cases were found at Cipto Mangunkusumo Hospital, with average patient age of 66.61 years from 1994 to 2013.²

Most complaints of BPH patients are lower urinary tract symptoms (LUTS), which can be divided into obstructive and irritable symptoms.¹ The goal of treatment in patients with BPH is to relieve symptoms and improve the patient's quality of life.³ Treatment options depend on the severity, ranging from conservative treatment (watchful waiting) to medication and surgery.^{1,2,4} Transurethral Resection of the Prostate (TURP) is a gold standard surgery in patients with symptomatic BPH.⁵

The LUTS experienced by BPH patients is associated with the high cost of personal and community health care, because of the impact on their quality of life.⁶ Length of stay is one of the sources of expenditure for BPH treatment costs. The longer the patient's length of stay, the the greater the cost for treatment in the hospital.

West Nusa Tenggara Province General Hospital Mataram is the referral center for Lombok and Sumbawa Island. There is no data in the hospital showing factors related to the length of hospital stay of BPH patients who undergo TURP. Therefore, it is necessary to investigate the factors associated with the length of stay of BPH patients at West Nusa Tenggara Province General Hospital Mataram for better patient care and reduced treatment costs.

Methods

This research is a descriptive-analytic study with a cross-sectional design to determine the factors associated with the length of stay of BPH patients who underwent TURP surgery at the West Nusa Tenggara Province General Hospital Mataram from 2012 to 2017. The time of conducting the study is from September 2018 to February 2019.

The population of this study consisted of all BPH patients who underwent TURP surgery at West Nusa Tenggara Province General Hospital Mataram between the 1st of January 2012 and the 31st of December 2017. The sample for this study consisted of all members of the population with complete medical record information.

The independent variables of this study were age; prostate volume; comorbidities, namely hypertension, diabetes mellitus (DM), coronary heart disease (CHD); and surgical complications, namely bleeding and TUR syndrome, while the dependent variable of this study was the length of hospitalization.

This study used secondary data in the form of medical records of patients enrolled at the West Nusa Tenggara Province General Hospital Mataram. Data analysis was performed using univariate analysis for each variable and bivariate analysis for the relationship between variables. The correlation test used is the Spearman and the Contingency Coefficient, which is adjusted to the scale of the variable data.



Results

Research data collection on factors related to the length of stay of BPH patients who underwent TURP West Nusa Tenggara Province General Hospital Mataram was carried out from 19th January 2019 to 30th January 2019. The population in this study were all BPH patients who undergo TURP at the West Nusa Tenggara Province General Hospital Mataram from January 2012 to December 2017, totaling 216 patients. We got 173 cases as research samples, which met the inclusion and exclusion criteria.

Descriptive analysis showed that the mean age of the patients was 65.55 years old, the youngest was 47 years old and the oldest was 96 years old. The mean prostate volume of BPH patients was 72.44 ml, the smallest volume was 13.85 ml and the largest was 192.20 ml. The average hospital stay of BPH patients was 6.27 days, with the shortest hospital stay being three days and the longest being 16 days.

Table I.1. Distribution of age, prostate volume, and length of stay

Variable	Frequency (n)	Percentage (%)
Age		
• 41-50	7	4,05
• 51-60	48	27,74
• 61-70	67	38,73
• 71-80	44	25,43
• >80	7	4,05
Total	173	100
Prostate volume		
• ≤20 ml	2	1,16
• Grade I	45	26,01
• Grade II	70	40,46
• Grade III	54	31,21
• Grade IV		
Total	173	100

Length of stay		
• ≤6 days	112	64,74
• >6 days	61	35,26
Total	173	100

Table I.1 shows that the most patients are in the 61-70 years age group (38.73%) and the lowest in the 41-50 years age group (4.05%) and >80 years (4.05%). Most of the patients had a prostate volume that was in grade III, which was 70 people (40.46%), and at least had a prostate volume of 20 ml and grade I, which were two people (1.16%) each. 64.74% of patients had a length of stay of 6 days, while the rest had a length of stay of >6 days.

Table I.2. Characteristic of comorbidities

Comorbidities	Frequency (n)	Percentage (%)
• Hypertension	134	77,4
• DM	0	0
• Coronary artery disease	1	0,6
• Hypertension dan DM	2	1,2
• Hypertension and CHD	3	1,7
• DM and CHD	0	0
No comorbidities	33	19,1
Total	173	100

Table I.2 shows that the most BPH patients who underwent TURP had comorbidities, as many as 140 patients (80.9%), while 33 patients (19.1%) did not have comorbidities. Of the 140 patients, most of them suffered from hypertension alone, namely 134 patients (77.4%), two patients with hypertension and DM (1.2%), and three people suffering from hypertension and CHD (1.7%).), and only one person suffered from CHD (0.6%).



Table 1.3. Characteristic of surgical complication

	Frequency (n)	Percentage (%)
Bleeding		
Bleeding	94	54,34
No bleeding	79	45,66
Total	173	100
TUR Syndrome		
TUR	0	0
No TUR	173	100
Total	173	100

Table 1.3 shows that 54.34% of patients had bleeding complications, whereas there were no patients with TUR syndrome (0%). Patients who did not experience surgical complications were 45.66%.

Table 1.4. Spearman analysis results between age and prostate volume with length of stay in hospital

Variable	Length of stay	
	Correlation coefficients (r)	Significance (p)
Age	0,033	0,663
Prostate Volume	-0,009	0,910

Table 1.4 shows that there is no significant relationship between age and length of stay in hospital and between prostate volume and length of stay with a p-value > 0.05.

Table 1.5. The results of the contingency coefficient analysis between comorbidities and bleeding complications with length of stay in hospital

Variable	Length of stay	
	Value	Significance (p)
Comorbidities		
Hypertension	0,022	0,775
CHD	0,056	0,459
Hypertension and DM	0,033	0,661
Hypertension and CHD	0,087	0,251
Surgical Complication		
Bleeding	0,028	0,715
TUR Syndrome	-	-

Table 1.5 shows that there is no significant relationship between comorbidities and length of stay and between TUR syndrome and length of stay with a p-value >0.05. Analysis of the relationship between complications of TUR Syndrome and length of stay could not be performed. This is because the variable is constant, and none of the patients experienced these complications.

Discussion

This study showed no significant association between age and length of stay of BPH patients who underwent TURP at West Nusa Tenggara Province General Hospital Mataram from 2012 to 2017. These findings were similar to research by Mahendrakrisna, Maulana, and Kresnodi at Bhayangkara Hospital Mataram in 2014, specifically no association between age and length of stay in BPH patients who underwent TURP. The age characteristics of the patients in their study were similar to those in this study, in which the average age was 65.75 years.⁸ However, according to Wolverson et al., the patient's age was associated with the length of postoperative hospital stay, and being over 70 years of age was associated with an extension of six days or more of one postoperative hospital stay. In their study, there was a

significant difference between the mean age of all patients (74 years) and the mean age of patients staying ten days or longer (79 years).⁹ A study by Kirolos et al. showed similar results to Wolverson et al., who found a relationship between age and length of postoperative hospital stay. In their study, age contributed to the length of stay in four out of ten patients over the age of 80 years. In addition, some patients require multiple exercises and a trial of voiding due to axonal and muscle degeneration in old age, which may affect the length of stay.¹⁰

The difference in study results may be due to the characteristics of the samples used. In Wolverson et al., the age distribution of patients in their study is out of 100 patients, ten were under 60 years old, 36 were 60-70 years old and most were over 70 years old which counts 54 patients.⁹ In this study at West Nusa Tenggara Province General Hospital Mataram, the age distribution of patients was 173 patients, with 55 patients under 60 years old, 67 patients were 61-70 years old, and 51 patients over 70 years old. In addition, patients with a length of stay less than or equal to 6 days dominated with a total of 112 patients (64.7%).

A Study by Wolverson et al. and Kirolos et al. found that there was an association between the weight of the TURP-resected prostate and the length of the patient's hospital stay.^{9,10} Prostate volume is related to surgical time and intraoperative bleeding risk.¹¹ Surgical time is related to the length of hospital stay in patients with BPH.¹² Compared with the two studies, this study assessed overall prostate volume before TURP and did not assess the weight of the resected prostate. Based on the results of this study, prostate volume did not have a significant

relationship with the length of stay. This can occur with postoperative care that is carried out properly to avoid prolonging the patient's length of stay.

The comorbidities assessed in this study were hypertension, diabetes, and coronary artery disease, and it showed no significant association between comorbidities and hospital stay of BPH patients who underwent TURP at West Nusa Tenggara Province General Hospital Mataram. These results differ from Wolverson et al., which found a relationship between cardiovascular comorbidities and length of stay in patients with BPH.⁹ Based on this study, the presence of comorbidities in BPH patients was not a likely barrier to prolonging the treatment duration of BPH patients who underwent TURP at West Nusa Tenggara Province General Hospital Mataram. This may be due to the control of comorbidities before and after surgery to avoid prolonging the hospital stay.

The results of this study showed no significant association between bleeding complications and length of hospital stay. Bleeding risk is related to preoperative infection, urinary retention, prostate volume, and time to resection.¹¹ The occurrence of bleeding requiring treatment may affect the time to hospital admission, such as the need for blood transfusion.¹² According to Marszalek et al., blood loss during surgery can be reduced by careful surgery at a rational pace and paying attention to every detail.¹¹ Technological advances in TURP implementation, such as the use of microprocessor-controlled units and video TUR can also reduce transfusion rates.¹³ In this study, bleeding complications that caused a decrease in postoperative hemoglobin levels could be overcome so as



not to cause an extension of the length of hospitalization.

There are no BPH patients who underwent TURP developed TUR syndrome between January 2012 and December 2017, so the relationship between TUR syndrome and length of hospital stay is not known. TUR syndrome is caused by the absorption of irrigating fluid during surgery which is hyposmolar and causes delusional hyponatremia. Currently, TUR syndrome is rare, and the incidence of this syndrome has decreased significantly in the past decades from 3.5% to <1%.¹¹ Theoretically, TUR syndrome can be eliminated by using isotonic irrigation fluids. Currently, some techniques can safely avoid TUR syndrome, including bipolar TURP (B-TURP).^{11,14}

Limitations of this study are factors that can be related to the length of time a person undergoes hospitalization, in this case, BPH patients, are not only determined by age, prostate volume, comorbidities, and surgical complications. Other factors can affect the analysis of the relationship between these variables, which cannot be controlled by the researcher. In addition, this study used secondary data, therefore researchers have difficulty developing research due to limited data in medical records. More research is needed to pay more attention to other factors that may affect the length of hospital stays, such as admission procedures, treatment classes, medical action decisions, operating scheduling procedures, waiting time for surgery, length of operation, surgical operators, discharge procedures, the person in charge of costs, and reasons to discharge.

Conclusion

Based on the results of data analysis and discussion, it can be concluded that there is no significant relationship between age and length of stay, prostate volume and length of stay, comorbidities with the length of stay, and surgical complications with the length of stay in BPH patients undergoing TURP in West Nusa Tenggara Province General Hospital Mataram from 2012 to 2017. More research is needed to pay more attention to other factors that may affect the length of hospital stays.

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