

Predictors of Successful Trial without Catheter in Patients with benign Prostatic Obstruction

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ABSTRACT

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Objectives: One of the clinical presentations of benign prostatic enlargement (BPE) is acute urinary retention (AUR), and these patients are treated with per urethral catheterization. Trial without catheterization is the next step in these patients and involves administering an alfa blocker and removal of the catheter after 3 days. We studied these patients for identifying the possible factors that predict the success of trial voiding without catheter (TWOC).

Methods: Patients with an episode of AUR due to BPE were assessed with detailed history, physical examination and ultrasonography. All patients were catheterized and treated with an alfa blocker. All patients satisfying the inclusion criteria were given TWOC. Outcomes were correlated with factors such as age of the patient, prostate size, type of AUR, alfa blocker used and duration of catheterization.

Results: A total of 162 patients were included in the study. Patients younger than 60 years showed success rate of 73% compared to 48% in older patients ($p < 0.004$), prostate size of less than 50grams showed a success of 66% compared to 48% in larger glands ($p < 0.02$) and precipitated AUR had 80% success compared to 52% in spontaneous group ($p < 0.007$). Duration of catheterization and specific type of alfa blocker were not significant factors for successful TWOC in our study.

Conclusion: Younger age, smaller prostate and precipitated AUR favour success of TWOC.

Keywords: Trial without catheter, Acute urinary retention, Benign prostatic enlargement, Alfa blocker

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INTRODUCTION

Acute urinary retention (AUR) is a common long-term outcome in the natural history of benign prostatic hyperplasia (BPH). AUR necessitates patients for an urgent hospital visit for relief of pain, eventually treated by catheterization. Patients need to be on follow up for an attempt at catheter removal. Primary intention of the initial examination and evaluation is to predict the candidates who will have a successful trial voiding and hence can avoid the morbidity associated with long term catheterization or an eventual surgery. Various factors like type of retention (spontaneous Vs precipitated), size of the prostate, age of the patient, volume of urine drained and serum prostate specific antigen (PSA) value independently predict the success of trial without catheterization (TWOC). In this study we aim to evaluate prospectively the possible factors affecting the success of trial voiding in the management of AUR.

METHODS

This prospective study was conducted over a period of 12 months. Ethical approval was obtained from the institutional review board. Written informed consent was taken from all the participants.

The study included all male patients who presented with an episode of acute urinary retention to the emergency department at our institution with a provisional diagnosis of benign prostatic obstruction (BPO). Salient clinical history (spontaneous vs precipitated retention) and findings of examination including digital rectal examination (DRE) were noted on a predesigned form. All these patients underwent per urethral catheterisation under sterile precaution. Blood was drawn for renal function test (RFT) estimation. All patients were prescribed one of the following alfa blockers: tamsulosin, alfuzosin or silodosin. Transabdominal ultrasound was done within 48 hours after catheterisation using a

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Table 1. Showing the findings of descriptive statistics

Descriptive	Mean	Standard deviation
Age	65.93	
duration of LUTS (in months)	13.03	11.81
duration of catheterisation (in days)	4.35	1.297
prostate size/ volume (in grams)	54.15	16.59

3.5 MHz curvilinear probe. The prostatic volume was recorded. The upper urinary tracts were also assessed.

Patients with diagnosis of prostate cancer, BPO with enlarged median lobe, chronic urinary retention, urethral stricture disease, urinary tract infection, renal impairment, bladder or urethral stones, bilateral hydro-nephrosis or those with neurological disorders affecting continence were excluded from the study.

Trial without catheter was done in the urology outpatient clinic within 3 to 10 days after catheterisation. The post-void residual urine was measured by transabdominal ultrasound. Voiding was judged to be unsuccessful if the post-void residual urine was greater than 150 mL on ultrasound.¹

Patient’s age, prostate volume, type of AUR, alfa blocker used, duration of catheterisation was then correlated with the success of TWOC (**Table 1**). Statistical analysis was done using chi square test.

Table 2. Univariate Analysis

Variables	TWOC		Chi Square	OR (odds ratio)	95% CI	‘p’ value	
	Success	Failure					
Age group	Up to 60	38(73%)	14(26.9%)	8.27	2.81	1.37-5.77	0.004
	More than 60	54(48%)	56(50.9%)				
Prostate size	Up to 50cc	49(66.2%)	25(33.8%)	4.92	2.05	1.1-3.8	0.02
	More than 50cc	43(48.9%)	45(51.1%)				
Alfa blocker	Tamsulosin	47(51.1%)	45(48.9%)	7.06			0.02
	Alfuzosin	9(45%)	11(55%)				
	Silodosin	36(72%)	14(28%)				
Duration of catheterisation	Up to 3 days	19(65.5%)	10(34.5%)	1.096	1.56	0.67-3.61	0.29
	3 to 10 days	73(54.9%)	60(45%)				
Type of AUR	Precipitated	21(80.08%)	5(19.2%)	7.26	3.84	1.37-10.78	0.007
	Spontaneous	71(52.2%)	65(47.8%)				

Table 3. Shows the binary logistic regression analysis

Variables	Logistic regression	
	Odds Ratio	p value
Age up to 60	2.52	0.01
Prostate size up to 50cc	2.11	0.03
AUR- precipitated	4.90	0.004
Alfa blocker	0.705	0.07

RESULTS

We studied a total of 190 patients. Out of this, 28 patients were excluded as they did not satisfy the inclusion criteria. Of the 162 patients included, 92 had a successful TWOC.

Univariate analysis for individual variables calculated using Chi Square test is depicted in **Table 2**.

Univariate analysis showed that age group (up to 60years Vs more than 60 years), prostate size (up to 50gm Vs more than 50gm), alfa blocker used and the type of AUR (precipitated Vs spontaneous) were found to be significant. The duration of catheterisation (up to 3 days Vs more than 3 days) was not found to be significant in univariate analysis.

Using binary logistic regression, multivariate analysis was done with all variables that were found to be significant in univariate analysis. Enter method was used to do the logistic regression. **Table 3** shows the binary logistic regression analysis. The final results showed that age group (OR 2.52, p 0.001), prostate size (OR 2.11, p 0.003), type of AUR (OR 4.90, p 0.004) were found to be significant risk variables which affect the outcome of TWOC.

DISCUSSION

Acute urinary retention is managed initially with perurethral or suprapubic catheterisation. The management options following this are not standardised and could be TWOC or surgery. As TWOC avoids the various complications of continuous bladder drainage, this modality is currently being practised in most centres. There are various predictors of successful TWOC and include age of the patient (< 70 years), size of the prostate (< 40 grams), type of retention (precipitated), PSA value (<1.6ngm/ml) and duration of catheterisation (3-7 days).^{1,7}

In RETEN WORLD survey of 6074 men,

median age of patients developing AUR was 70 years, compared with 65.9 years in our study. In RETEN survey, age <70 years was associated with a successful TWOC ($p < 0.001$). In our study, age <60 years was associated with successful TWOC in 73%, the success reduced to 48% in age >60 years. The 95% CI was 1.37-5.77 ($p = 0.004$). The ALFAUR trial showed that age over 65 years was negatively associated with successful TWOC ($p < 0.001$), a conclusion very similar to our study.^{1,2}

We found a significant correlation ($p = 0.02$) of TWOC success in smaller glands. Successful TWOC was seen in 66.2% patients with prostate size <50cc, however the success fell to 48.9% for glands >50cc. In the RETEN survey, size of <50 g was associated with a successful TWOC ($p < 0.001$).¹ Zeif et al in a prospective audit of 100 patients reported that success was more likely in patients with smaller glands ($p = 0.004$).³ Bhomi and Bhattachan reported a prostate size of 40 g on transabdominal ultrasound to predict successful outcome, with a specificity of 73% and a sensitivity of 84%.⁴ Mariappan et al in their study of 54 men with a mean volume of 69.7 ml showed that the smaller prostate size was associated with successful TWOC (mean difference, 22 mL; 95% CI, 2.7 to 41.3; $p = 0.03$).⁵

In the present study, the precipitated AUR had successful TWOC outcome of 80.08% (p value 0.007). Common causes for precipitated AUR in our study included alcohol intake, drugs and surgery. In RETEN-WORLD survey, 4667 men underwent a first TWOC with an overall success rate of 61.4% (precipitated AUR 66.3%, spontaneous AUR 59.0%, $p < 0.001$). AUR of spontaneous origin was associated with significantly higher rates of TWOC failure.¹

The RETEN survey showed that the chances of TWOC success doubled when α 1-blocker was used prior to TWOC.¹ In our study all patients were given α 1-blocker (Tamsulosin 0.4mg, Alfuzosin 10mg, Silodosin 8mg), but all had equal efficacy as proved by multivariate analysis.

The duration of catheterization was not significantly affecting the outcome of TWOC in our study. Early catheter removal (at 3 days) was done in 29 patients with success in 65%, indicating that early TWOC is successful in significant number of patients therefore reducing catheter related morbidity.

In the ALFAUR study, in the second phase at 6 months follow up of patients who had successful TWOC, the patients were randomized into two groups of

Alfuzosin 10 mg or placebo. This study showed the need for BPH related surgery in 17.1% of alfuzosin group and 24.1% of placebo group.⁶ RETEN survey had identified variables like severe LUTS, spontaneous AUR and large drained urine volume as the predictors for recurrent AUR or prostate related surgery after a successful TWOC.¹

In conclusion, younger age, smaller prostate and precipitated AUR favour success of TWOC as showed by multivariate analysis. Thus, clinicians can identify a subgroup of patients who possibly fail the trial voiding and can be counselled for surgical intervention.

END NOTE

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Conflict of Interest: None declared

Editor's Remarks: The prospective study has relevance in choosing the right option in a patient presenting with acute urinary retention. The paper discusses the various related factors and helps make the correct choice.

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