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EARLY VS LATE TRIAL OF VOIDING IN PATIENT WITH URINARY RETENTION SECONDARY TO BENIGN PROSTATIC HYPERPLASIA

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ABSTRACT

BPH is a common cause of significant lower urinary tract symptoms in men and is the most common cause of bladder outflow obstruction in men >70 years of age. The prevalence increases from 25% among men 40–49 years of age to >80% among men 70–79 years of age. Acute urine retention (AUR) is a common urological emergency that is characterized by sudden and painful inability to pass urine. The incidence of AUR in patients with BPH varies widely from 0.4% to 25%. Management of AUR consists of immediate bladder decompression by catheterization. Trial without catheter (TWOC)after a course of alpha blockers is the traditional practice but the duration of urethral catheter and alpha-blockers is unclear. **AIM-** To study the effect of early vs late catheter removal in patient with urinary retention secondary to benign prostatic hyperplasia. **OBJECTIVE** The objective of this study is to evaluate the success of early and late removal of urinary catheter after acute urinary retention (AUR) in patients with benign prostatic hyperplasia (BPH) under tamsulosin treatment. **MATERIALS AND METHOD-** Group I :75 patients recieved Tamsulosin 0.4 mg once daily and catheter removal after 3 days. (EARLY REMOVAL) Group II :75 patients received Tamsulosin 0.4 mg once daily and catheter removal after 7 days. (LATE REMOVAL). **RESULTS-** 80% of group I patients had successful Trial of voiding and 65% of group II patients had successful trial of voiding. Group II patients showed more complications.

KEYWORDS

acute urinary retention, trial of voiding, BPH, trial without cathter, tamsulosin

INTRODUCTION

Benign prostatic hyperplasia (BPH) is increase in size of the prostate gland. It is a condition that occurs with aging; It Occurs in men over 50 years of age; by the age of 60Years,50% of men have histological evidence of BPH.[1]

It is a common cause of significant lower urinary tract symptoms in men and is the most common cause of bladder outflow obstruction in men >70 years of age [1] The prevalence increases from 25% among men 40–49 years of age to >80% among men 70–79 years of age.[2]

Several definitions exist in the literature when describing BPH. These include bladder outlet obstruction, LUTS, and benign prostatic enlargement (BPE). BPH describes the histological changes, BPE refers to the increased size of the gland (usually secondary to BPH), and bladder outlet obstruction is defined as the blockage to urinary flow. [2,3] Those with BPE who present with bladder outlet obstruction are also termed benign prostatic obstruction.[4]

LUTS describe the urinary abnormalities shared by disorders affecting the bladder and prostate typically caused by BPH. These terms have largely replaced those symptoms historically termed "prostatism."

The development of BPH is characterized by stromal and epithelial cell proliferation in the prostate transition zone, which surrounds the urethra. This leads to urethral compression and the development of bladder outflow obstruction, which can result in clinical manifestations of LUTS, urinary retention, or infections due to incomplete bladder emptying.[5] Long-term, untreated disease can lead to the development of chronic high-pressure retention (a potentially life-threatening condition) and long-term or permanent changes to the bladder detrusor muscle.

BPH treatment options range from watchful waiting to various medical and surgical interventions. Risk factors may be divided into non-modifiable and modifiable. Other factors such as age, genetics, geographical location, and obesity have all been shown to influence the development of BPH.[6,7]

ACUTE urinary retention is a complication of the obstructive process often caused by benign prostatic hyperplasia (BPH),[8,9] While the overall incidence of BPH-related acute urinary retention is 4.5-6.8 per 1,000 men per year; over 1 in 10 men in their 70s and over 1 in 3 men in their 80s experience an episode of urinary retention. [10,11] Management of AUR consists of immediate bladder decompression by catheterization. However, while pharmacological management has significant demonstrable benefit, surgery for BPH may confer greater absolute reductions in long-term risk of catheterization for acute urinary retention.[12,13]

A trial without catheter (TWOC) is considered preferable to leaving a catheter in place. Alpha-1 (α-1) blockers decrease smooth muscle tone in the prostate, thereby rapidly improving urinary symptoms and flow.[14] Tamsulosin has a rapid onset of action and is effective in patients with moderate or severe symptoms. The drug is, therefore, a valuable therapeutic option, with both demonstrated and potential advantages over older nonselective agents, in the management of patients with lower urinary tract symptoms (LUTS) associated with BPH.[15]

TWOC after course of Alpha blocker is traditional practice but the duration of catheter removal is unclear ranging from 1 to 35 days.[16]

The rationale of study was that longer duration of catheter was disadvantage to patients in term of morbidity, complications, longer hospital stays, more cost . This disadvantage can be overcome by shortening the duration of catheterization with early catheter removal and hospital discharge. So, in this study we compared trial without catheter after 3 days (Early) vs trial without catheter after 7 days (Late) in patient with urinary retention secondary to benign prostatic hyperplasia.

Aims & Objectives

Aim

- To study the effect of early vs late catheter removal in patient with urinary retention secondary to benign prostatic hyperplasia.

Objective

- The objective of this study is to evaluate the success of early and late removal of urinary catheter after acute urinary retention (AUR) in patients with benign prostatic hyperplasia (BPH) under tamsulosin treatment.

MATERIALS & METHODS

Study Design And Setting: Comparative study of patients in NMCH, Sasaram.
Sample Design: Prospective comparative study.
Sampling Method : Alternate patients to be evaluated
Sample Size: 150
Group I: 75 patients will receive Tamsulosin 0.4 mg once daily and catheter removal after3 days. (EARLY REMOVAL)

Group II : 75 patients will receive Tamsulosin 0.4 mg once daily and catheter removal after7 days. (LATE REMOVAL)
Duration of Study: 2 YEARS.

Inclusion Criteria
- All adult patients, attending surgical/urological outpatient dept. and/or admitted patients of acute urinary retention secondary to BPH in NMCH, Sasaram.
- Post void residual urine <1000ml

Exclusion Criteria
- Renal impairment.
- Suspected urethral stricture.
- Neurogenic bladder.
- Cancer prostate.
- Retention of urine Post Spinal Anaesthesia.
- Previous use of alpha blockers.
- Defaulters

Patient Evaluation
- Baseline evaluation included detailed medical history, physical examination, and assessment of lower urinary tract symptoms using the International Prostate Symptom Score (IPSS).
- Prostate size was measured using transrectal ultrasound.
- Retained urine volume was measured post-void using ultrasound.
- Blood samples were collected to measure Prostate-Specific Antigen (PSA) levels.

Catheterization
- All patients initially received an indwelling urinary catheter to relieve acute urinary retention.

Medication
- Tamsulosin 0.4 mg was administered once daily to all patients.

Catheter Removal:
- In Group I, the catheter was removed after 3 days.
- In Group II, the catheter was removed after 7 days.

Follow-Up:
- Patients were monitored for successful voiding post-catheter removal. Success was defined as the ability to void spontaneously without the need for re-catheterization.
- Follow-up assessments included Q max measurement using uroflowmetry, IPSS, and evaluation for any complications such as urinary tract infections (UTIs), hematuria, obstruction, leakage, or fever.

Data Collection and Analysis
Data were collected on age distribution, prostate size, retained urine volume, IPSS, PSA levels, Q max, and complications. Statistical analysis was performed using chi-square tests for categorical variables and t-tests for continuous variables. P values < 0.05 were considered statistically significant. The chi-square value for success rates between the two groups was 4.06131, with a P value of 0.04, indicating a significant difference favoring early catheter removal. Detailed bivariate analysis was conducted to assess the relationship between various clinical variables and success/failure rates.al the statistical analysis done by SPSS Ver-26.0

OBSERVATIONS & RESULTS

Table 1: Age Distribution Among Two Groups

Age Range (years)	Group I (Early Removal) (n=75)	Group II (Late Removal) (n=75)
50-59	20 (26.7%)	18 (24%)
60-69	35 (46.7%)	40 (53.3%)
70-79	15 (20%)	12 (16%)
80+	5 (6.7%)	5 (6.7%)
Total	75 (100%)	75 (100%)

Table 2: Distribution Of Prostate Size Among Two Groups

Group	Prostate Size (cc)	P value
Group I (Early Removal)	48.2 ± 4.3	0.347
Group II (Late Removal)	47.5 ± 2.4	

Table 3: Distribution Of Retained Urine Volume Among Two Groups

Group	Retained Urine Volume (mL)	P Value
Group I (Early Removal)	650.3 ± 145.7	0.097
Group II (Late Removal)	655.8 ± 132.8	

Table 4: Distribution Of IPSS (score) Among Two Groups

Group	IPSS Score	P Value
Group I (Early Removal)	12.4 ± 3.8	0.147
Group II (Late Removal)	13.0 ± 2.9	

Table 5: Distribution Of PSA Value Among Two Groups

Group	PSA (ng/mL)	P Value
Group I (Early Removal)	1.91±0.78	0.231
Group II (Late Removal)	1.87±0.88	

Table 6: Distribution Of Q Max Value Among Two Groups

Group	Q max (mL/sec)	P Value
Group I (Early Removal)	17.4 ± 3.6	0.094
Group II (Late Removal)	16.7 ± 3.8	

Table 7: Success Or Failure Rates

Outcome	Group I (Early Removal) (n=75)	Group II (Late Removal) (n=75)
Success (voiding)	60 (80%)	49 (65.3%)
Failure (re-catheterization)	15 (20%)	26 (34.7%)
Total	75 (100%)	75 (100%)
Statistical Inferences-	Chi-square value- 4.06131 P Value- 0.04*	

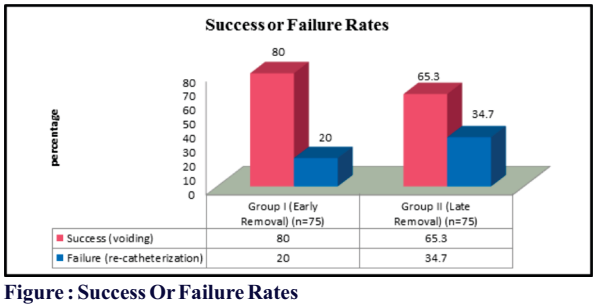

Figure : Success Or Failure Rates

Table 15: Complications

Complication	Group I (Early Removal) (n=75)	Group II (Late Removal) (n=75)	P Value
Obstruction	2 (2.7%)	6 (10.7%)	0.05
Urinary Tract Infection (UTI)	2 (2.7%)	15 (20.0%)	0.001
Hematuria	2 (2.7%)	7 (9.3%)	0.087
Leakage	1 (1.3%)	9 (12%)	0.01
Fever	2 (2.7%)	6 (8.0%)	0.014
Total Complications	9 (12.0%)	43 (57.3%)	0.0001

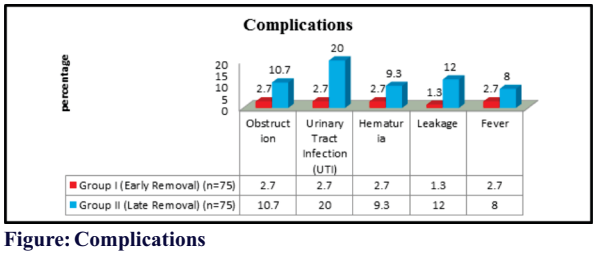

Figure: Complications

DISCUSSION

Clinical BPH is one of the most common diseases in aging men which can lead to AUR.[17] The prevalence of BPH rises markedly with increased age. Autopsy studies have observed a histological prevalence of 8%, 50%, and 80% in the fourth, sixth, and ninth decades of life, respectively.[18]

The study indicates that the majority of participants in both groups were within the 60-69 years age range, with Group I (early removal) comprising 46.7% and Group II (late removal) comprising 53.3% in this category. The 50-59 years age range included 26.7% of patients in Group I and 24% in Group II. The 70-79 years age range had 20% of patients in Group I and 16% in Group II, while the 80+ years age range included 6.7% of patients in both groups.

A retrospective study conducted by Bansal and Aditi Arora of 2188 patients presenting with first episode of AUR showed that age was an independent predicting factor of successful TWOC for AUR and that patients older than 65 years were at a 1.84 times higher risk of failure of

TWOC than were those younger than 65 years.

However, Lucas et al.[19] in 2005 and Mariappan et al.[20]in 2007 found that the efficacy was similar across the age range and no association between TWOC outcome and age.

In the present study, prostate size among the two groups shows that the mean prostate size for Group I (early removal) is 48.2 ± 4.3 cc, while for Group II (late removal) it is 47.5 ± 2.4 cc. The P value of 0.347.

Previous studies by Kumar et al.[21] in 2000 and Zeif et al. in 2010[22] also demonstrated that failure of TWOC was associated with larger prostate size. However, studies by Tan and Foo in 2003[23] and Djavan et al. in 1997[24] showed contradictory negative results.

Bivariate analysis was carried out in the present study The prostate size and success/failure rates for Group I (early removal) indicate that patients with successful outcomes had a mean prostate size of 42.3 ± 2.34 cc, while those with failures had a larger mean prostate size of 45.32 ± 4.23 cc, with a P value of 0.034. For Group II (late removal), the mean prostate size for successful outcomes was 43.2 ± 4.21 cc, and for failures, it was 45.22 ± 2.47 cc, with a P value of 0.045. The P values indicate that in both groups, a larger prostate size is significantly associated with higher failure rates. However, when comparing prostate sizes between the two groups, the P values of 0.147 for successful outcomes and 0.895 for failures suggest no significant difference in prostate size distribution between early and late removal groups.

Taube and Gajraj in 1989[25] found that the successful outcome of TWOC is associated with retained volume >900 ml. But various studies has shown that if PVRU is more than 1 litre, it could be a risk factor for failed TWOC. It suggests correlation between residual volume and success of TWOC.

In this study, Group I (early removal) show that patients with successful outcomes had a mean retained urine volume of 600.3 ± 125.7 mL, while those with failures had a higher mean volume of 750.4 ± 130.7 mL, with a P value of 0.001. For Group II (late removal), the mean retained urine volume for successful outcomes was 620.5 ± 120.2 mL, and for failures, it was 710.8 ± 140.6 mL, with a P value of 0.028. These P values indicate that higher retained urine volumes are significantly associated with higher failure rates in both groups. Comparing retained urine volumes between the two groups, the P values of 0.087 for successful outcomes and 0.047 for failures suggest a significant difference in retained urine volume distribution for failures, but not for successful outcomes, between early and late removal groups.

In this study, The IPSS (International Prostate Symptom Score) and success/failure rates for Group I (early removal) indicate that patients with successful outcomes had a mean IPSS of 11.2 ± 2.8, while those with failures had a higher mean IPSS of 15.3 ± 3.5, with a P value of 0.001. For Group II (late removal), the mean IPSS for successful outcomes was 11.5 ± 3.0, and for failures, it was 14.0 ± 2.7, with a P value of 0.034. These P values suggest that higher IPSS scores are significantly associated with higher failure rates in both groups. Comparing IPSS scores between the two groups, the P values of 0.234 for successful outcomes and 0.098 for failures indicate no significant difference in IPSS score distribution for successful outcomes and a borderline significant difference for failures between early and late removal groups.

In the present study, the distribution of PSA (Prostate-Specific Antigen) values between the two groups indicates that Group I (early removal) has a mean PSA value of 1.91 ± 0.78 ng/mL, while Group II (late removal) has a mean PSA value of 1.87 ± 0.88 ng/mL. The P value of 0.231 suggests that there is no statistically significant difference in PSA levels between the early and late removal groups.

Study results are similar to those of Zeif et al. in 2010[22] who also found no impact of serum PSA level on the outcome of TWOC. However, Lim et al. in 1999[l] studied the association of serum PSA with outcome of TWOC and showed that serum PSA is significantly higher in patients in whom TWOC failed and assumed that it is due to prostatic infarction or infection giving rise to AUR.

Our study demonstrated that 80% of cases in Group –I and 65.3% in group II who received tamsulosin before catheter removal succeeded TWOC while 20% failed. McNeill et al. in 2004 found in their study that the use of α-blockers increases the TWOC success rate compared to placebo, 61.9% versus 47.9%, which approximate our study success rate. Similar findings are reported by Reten-World Study Group where the prevalent use of α-blockers (86%) worldwide is noted with the result doubling success rate of TWOC.[21]

In 2011, Fitzpatrick et al.[26] found that catheterization for >3 days was associated with a significantly higher rate of adverse events compared with those catheterized for 3 days or less (33.8% vs. 19.7%, P < 0.001) which was in agreement with our study. between the two groups reveal significant differences in several areas. In Group I (early removal), 2 out of 75 patients (2.7%) experienced obstruction, compared to 6 out of 75 patients (10.7%) in Group II (late removal), with a P value of 0.05, indicating a statistically significant difference. Urinary tract infections (UTIs) were significantly more common in Group II (20.0%) compared to Group I (2.7%), with a P value of 0.001. Hematuria occurred in 2.7% of patients in Group I and 9.3% in Group II, with a P value of 0.087, indicating a non-significant difference. Leakage was significantly more common in Group II (12%) compared to Group I (1.3%), with a P value of 0.01. Fever was observed in 2.7% of patients in Group I and 8.0% in Group II, with a P value of 0.014, indicating a significant difference. Overall, the total complication rate was significantly lower in Group I (12.0%) compared to Group II (57.3%), with a P value of 0.0001, suggesting that early catheter removal is associated with fewer complications than late removal.

CONCLUSION

The study aimed to evaluate the effect of early versus late catheter removal in patients with urinary retention secondary to benign prostatic hyperplasia (BPH) under tamsulosin treatment. The findings indicate that early catheter removal is associated with a higher success rate of voiding (80%) compared to late removal (65.3%), with a statistically significant difference (P = 0.04).

Bivariate analysis revealed that several factors, including prostate size, retained urine volume, IPSS scores, and Q max values, significantly influenced the success or failure rates in both groups. Patients in the early removal group had better outcomes in terms of these clinical variables compared to those in the late removal group.

Complication rates were notably lower in the early removal group (12.0%) compared to the late removal group (57.3%), with significant differences in the rates of obstruction, urinary tract infections (UTIs), leakage, and fever. These findings suggest that early catheter removal not only enhances the success of voiding but also reduces the risk of complications associated with prolonged catheter use.

Finally, early catheter removal in patients with urinary retention secondary to BPH under tamsulosin treatment appears to be a more effective and safer strategy compared to late removal. This approach is associated with higher success rates for voiding and lower incidence of complications, making it a preferable option in clinical practice. Further studies could provide additional insights into the long-term outcomes and patient satisfaction associated with early catheter removal.

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