

COMPARATIVE STUDY BETWEEN CLEAN INTERMITTENT SELF-CATHETERIZATION (CISC) AND CONTINUOUS INDWELLING CATHETERIZATION (CIDC) IN RELIEVING ACUTE REFRACTORY RETENTION OF URINE DUE TO BENIGN ENLARGEMENT OF PROSTATE (BEP)

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Abstract

Objective: To compare the clean intermittent self-catheterization (CISC) with continuous indwelling catheterization (CIDC) in relieving acute urinary retention (AUR) due to benign enlargement of prostate (BEP).

Materials and Methods : A total 60 patients attending in urology department of Dhaka Medical college hospital were included according to inclusion criteria. Patients were randomized by lottery into two groups namely group –A and group –B for CISC and IDC drainage respectively. Thus total 60 patients 30 in each group completed study.

Results : Most men can safely be managed as out-patients after AUR due to BPH. The degree of mucosal congestion and inflammation within the bladder was found to be lower in those using CISC and the bladder capacity in these patients was also found higher. Patients with an IDC had a high incidence of UTIs than that of patients with CISC. During the period of catheterization the incidence of UTI was 43.3% in group B in comparison to 40% in group A; before TURP 36% in group B in comparison to 10% incidence in group A. According to patient's opinion CISC is better than IDC in the management of AUR. Experiencing bladder spasm, reporting blood in urine, management difficulties, incidence and severity of pain were less in CISC group, and the method of CISC was well accepted by patients as well as their family members.

Conclusion: From the current study it may be suggested that CISC is better technique for management of AUR patient due to BPH than IDC. It can also be very helpful when surgery must be delayed or avoided due to any reasons in this group of patients.

Key words: CISC, CIDC, BEP

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Introduction

Benign prostatic hyperplasia (BPH) is very common in older male causing symptoms those can markedly impair quality of life [1]. Although BPH rarely threatens life, it can contribute to various urological complications like urinary retention, recurrent urinary tract infection, recurrent gross haematuria, bladder stone, large bladder diverticulum or renal insufficiency[2].

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Acute urinary retention (AUR) is one of the most significant complications or long-term outcomes resulting from BPH. In the past, acute urinary retention had represented an immediate indication for surgery. Between 25% and 30% of men who underwent TURP had AUR as their main indication in older series and today most patients failing to void after an attempt of catheter removal still undergo surgery[3].

From an economic as well as from a patient point of view acute urinary retention is an important and feared event. In a BPH patient it presents as the inability to urinate with increasing pain, eventually a visit to the emergency department, catheterization, follow-up visits

to physicians, an attempt at catheter removal, and eventually recovery or surgery; it is both a painful and a time-consuming process. In older literature, the risk of recurrent AUR was cited as being 76% to 83% within 1 week of the first episode in men with diagnosed BPH[4].

Men with acute retention also have large prostate glands and hence greater operative duration. At TURP surgeons have also to face difficulties because of increased mucosal congestion, increased vascularity of prostate and small contracted bladder having IDC in-situ for a long period of time[5].

Since Lapides and associates reported the first experience with clean intermittent self-catheterization (CISC), this method has been widely used to treat different types of bladder retention and most studies reported good clinical results (Wyndaele and Maes, 1990).

Lapides hypothesized that host resistance was the major barrier to infection rather than bacterial factors. He theorized that even though bacteria were obviously being introduced into the bladder from CIC, the bladder's natural resistance to infection was preventing the bacteria from establishing infection. Furthermore, regular bladder emptying with CIC was providing optimal conditions for the bladder to resist infection. He further hypothesized that high intra-vesical pressures and over-distention reduced good vascularity, one of the major barriers to infection. Bladder mucosal vascularity is optimized when the bladder is allowed to store urine at low pressures without over distention. Furthermore, regular bladder emptying decreases the likelihood of significant bacterial multiplication, and thus the risk of infection [6].

Intermittent catheterization has many advantages over indwelling catheterization, including (a) significant reduction in bacteriuria and other complications, (b) reduced trauma to the urinary tract, and (c) greater patient independence[7]. However the major advantage of CISC over IDC is the convenience of not having an external device, and the maintenance of sexual activities[5].

One study has recently been done in Australia by Patel, Watts and Grand (2001). In this study they compared the outcomes of clean intermittent self-catheterization (CISC) and indwelling catheterization (IDC) for the management of acute urinary retention (AUR) due to

BPH and have established the superiority of CISC over IDC during long waiting period before surgery. In our country it is common practice to use IDC for the management of AUR due to BPH. With this background I feel the need for introducing the CISC to these patients during their evaluation as well as in waiting time before TURP as there is always a long waiting list for our outdoor patients.

Methods :

The study was conducted in the Urology Department of Dhaka Medical College and Hospital, from July 2004 to June 2006 with an indwelling catheter (IDC) in situ following an acute attack of urinary retention and clinically diagnosed as BPH were included as study population. Before inclusion of patients in the current study each patient was evaluated by detail history, physical examination, digital rectal examination (DRE), urine analysis, ultrasonography of kidney ureter bladder & prostate and by measuring serum PSA (Prostate Specific Antigen) level.

During history taking and physical examination all patients were also evaluated for their general condition. All systems were carefully examined with special attention to urogenital system. Digital rectal examination was done to determine prostate size & to exclude carcinoma prostate, perianal sensation, bulbocavernosus reflex were observed to detect any neurological lesion.

Urinalysis, culture & sensitivity, complete blood count, random blood sugar, serum creatinine, PSA were done in all cases to exclude urinary tract infection, carcinoma prostate. Transabdominal ultrasonogram was done to detect any hydronephrosis, PVR, prostate size, echotexture & hypoechoic lesion in the prostate. Plain X-ray KUB was done to exclude urinary stone disease and any lesion in vertebral column. E.C.G. was done to exclude ischemic heart diseases; X-ray chest was done for pre-operative evaluation.

A checklist was completed which include the particulars of the patients as well as relevant base line investigations in details. Informed written consent was also taken from each patient. The study was started after approval from the appropriate authority.

After sampling of patients, in group-A IDC of each patient was removed and the technique of CIC

described under appendix-1 was discussed with. Once the patient became familiar with the technique of CIC he used it on himself under supervision with a 12F Nelaton catheter. A urine sample was sent for microscopy and culture. Then he was given advice about the frequency of catheterization and will be discharged. If urine culture showed an infection or more than 105 CFU/ml then he was treated with sensitive antibiotics. Any patient who did not fully comprehend the technique or was unable to use CISC then he was given a trial without catheter (TWOC) and re-catheterized with an IDC fitted with a leg bag. In group-B patients with IDC underwent several TWOCs during their preoperative period and the IDC was changed every three weeks.

Every patient in each group was evaluated during admission and pre-admission period. During pre-admission period patient was followed up at 72 hours and then every three weeks to assess patient symptoms, urinary infection and to change IDC in group-B. They also used to contact over telephone for any problems and concerns during pre-admission period.

At TURP all patients received gentamicine as a prophylactic antibiotic, bladder & prostatic mucosa was visually evaluated, bladder capacity & vascularity of prostate was subjectively being noted. TURP was done in a standard way that is practiced in our institution.

After TURP the catheter was removed on third post-operative day when the patients' ability to void and PVR was also recorded. Finally the patients completed a questionnaire mentioned later as appendix 2. This questionnaire was designed to assess the patients' preference & opinions on different forms of urinary drainage.

Results

Of the total 60 subjects selected for study, 30 were in Group-A and the rests 30 were in Group-B. The Group-A was done CISC while the Group-B was done CISC. The findings of the study derived from data analysis are presented below:

Age of the patients :

The mean age of Group-A and Group-B were 62.87 ± 7.35 and 64.87 ± 7.52 years respectively. The groups were almost identical in terms of age ($p = 0.335$). The results were show in table I and fig. 1

Table I
Age of the respondents

Age range of the patients	Group	
	Group A (CISC)	Group B (CIDC)
50-59	10 (33.3%)	7 (23.3%)
60-69	17 (56.7%)	15 (50.0%)
70-80	3 (10%)	8 (26.7%)
Total	30 (100%)	30 (100%)

Clinical findings

5 patients of group A and 6 patients of group B had given history of pyuria. Only 1 (3.3%) patient of group B had fever and 1 (3.3%) patient of same group had haematuria.

3 (10%) patients of group A and 1 (3.3%) patient of group B had diabetes mellitus.

2 (6.7%) patients of group A and 1 (3.3%) patient of group B had CVA and 1 patient of group A and 3 patients of group B had history of MI within last 6 months. The results were show in table II.

Table II
Comparison of clinical findings of the both groups of respondents

Clinical variables	Groups	
	Group A (CISC)	Group B (CIDC)
Pyuria	5 (16.7%)	6 (20.0%)
Fever	0 (.0%)	1(3.3%)
Haematuria	0 (.0%)	1(3.3%)
Diabetes mellitus	3 (10.0%)	1(3.3%)
CVA	2 (6.7%)	1(3.3%)
MI	1(3.3%)	2 (6.7%)

Routine microscopic examination of urine

Out of all patients 8 (26.7%) of Group A and 9 (30%) of group B had more than 5 pus cells/HPF on urine microscopy.

4 (13.3%) patients of group A and 6 (20%) patients of group B had 5 or above RBC/HPF on their routine urine microscopy.

Table III
Urine microscopic examination

Microscopic findings	Group		p value*
	Group A (CISC)	Group B (CIDC)	
Pus cell (>5 cells/HPF)	8(26.7%)	9(30.0%)	.779
RBC (\geq 5/HPF)	4(13.3%)	6 (20%)	.497

* Unpaired t test was done to analyze the data; level of significance was 0.05.

Out of all respondents 1 (3.3%) patient each of both groups had stone, 3 (10%) patients of group A and 5 (16.7%) patients of group B had bladder trabeculation and 7 (10%) patients of each of both groups had intravesical protrusion on their USG findings.

Mean volume of prostate of Group A was observed 43.07 cc with a std. deviation of \pm 5.43 cc and group B was 45.87 cc with a std. deviation of \pm 9.03 cc.

USG findings of KUB region

	Group		P value
	Group A (CISC)	Group B (CIDC)	
Stone	1 (3.3%)	1 (3.3%)	1*
Bladder trabeculation	3 (10%)	5 (16.7%)	.448*
Intravesical protrusion	7 (23.3%)	7 (23.3%)	1*
Volume of prostate (cc)	43.07 (5.43)	45.87 (9.03)	.151**

*Chi squared test was done to analyze the data; level of significance was 0.05.

**Unpaired t test was done to analyze the data; level of significance was 0.05.

Presented as mean (\pm Std. deviation).

Findings at TURP and postoperative course

Out of all respondents 2 (6.7%) from group A and 7 (23.3%) from group B had mucosal congestion and inflammation of bladder. Mean bladder capacity at 65 cm of H₂O was observed 634.5 ml in group A and 316.5 ml in group B.

Mean resected weight of prostate found in group A patients was 35.96 gram and in group B patients was 49.4 gram.

Statistical significant different was observed in both groups in term of bladder capacity (<.05), whereas non-

significant difference was observed in term of other variables like mucosal congestion and Resection time of more than 1 hour was observed in 4 (13.3%) patients of group A and 12 (40%) patients of group B. Resection time was found to differ significantly between groups (P value <.05).

Findings at TURP (Mucosal congestion, bladder capacity, resected weight of prostate)

	Group		p value
	Group A (CISC)	Group B (CIDC)	
Mucosal congestion and inflammation of bladder	2 (6.7%)	7 (23.3%)	.148*
Bladder capacity at 65 cm of H ₂ O (ml)	634.5 ** (490-950)	316.5 (270-510)**	.001#
Resected weight of prostate (Gram)	35.96 ** (16-60)	49.4 (20-110)**	.794#

* Chi squared test was done to analyze the data; level of significance was 0.05.

Unpaired t test was done to analyze the data; level of significance was 0.05.

**Presented as mean (Range).

Discussion

At our institution most patients presenting with acute urinary retention due to prostatic enlarge are treated as outpatients in the emergency department where they are catheterized with an indwelling catheter (IDC) and fitted with a leg bag. They are then referred to urology outpatient department. In this study a total of 78 patients were considered for inclusion, but 11 were excluded before randomization because of prostate cancer (six), severe renal impairment (three), dilated upper tract on ultrasound & Vesico-ureteral reflux on micturating cysto-urethrogram (two). After randomization three patients in the CISC group were withdrawn from the study due to their inability to use CISC and seven (five CISC, two IDC) failed to attend for follow-up visits. Thus total 60 patients 30 in each group completed this study.

Present study revealed that more than half (56.7%) of the subjects of Group-A were between 60-69 years of age followed by 33.3% between 50 –59 years and rest 10% between 70-80 years of age. In Group-B 50% of subjects were between 60-69 years of age and another 26.7% between 70-80 years, and rest 23.3% between

50-59 years of age. The mean age of Group-A and Group-B were 62.87 ± 7.35 and 64.87 ± 7.52 years respectively. The age ranges of both groups were uniformly distributed. So the groups were almost identical in terms of age ($p = 0.335$).

In this study other baseline data derived from history, physical findings, routine microscopic examination of urine, blood test and USG findings of both groups were also compared. It was found that there was no statistically significant difference in pre-study parameter between these two groups. From the date of randomization and grouping mean days of catheterization (mean days to TURP) was observed in two groups having two different techniques of catheterization and no significant difference was observed in both groups of patients in term of duration of catheterization and days to TURP ($P > .05$). Therefore it can be concluded that randomization had generated two well matched groups.

However mean volume of prostate of Group A was observed 43.07 cc with a std. deviation of ± 5.43 cc and group B was 45.87 cc with a std. deviation of ± 9.03 cc. These observations also support Pickard, et al. (1998) who found that BHP patients presenting with acute retention have larger prostate glands and more often need surgery. They also found that the larger prostate size of men presenting with acute retention in comparison to symptomatic BPH is associated with intra-operative complications like increased blood loss due to increased operative duration, need for blood transfusion, need for a second procedure etc.

In the present study to evaluate outcomes of two different catheterization techniques, were the findings during TURP (inflammation of bladder mucosa, bladder volume, resection time and resection weight), immediate postoperative course (ability to void after removal of catheter, post operative pyrexia, post voidal residual volume), incidence of UTI and patient's preference to method of catheterization.

At the time of operation only 2 (6.7%) out of 30 patients using CISC had evidence of inflammation in their bladder; in IDC group 7 (23.3%) out of 30 had mucosal congestion and inflammation of bladder that was subjectively noted. The mean bladder capacity at 65 cm of H₂O column was significantly different between CISC group and the IDC groups ($P < .001$). Mean bladder capacity at 65 cm of H₂O was observed 634.5 ml in group A and 316.5 ml in group B. Mean resected weight of prostate found in group A (CISC) patients

was 35.96 gram and in group B (IDC) patients was 49.4 gram.

These results are nearly comparable to Patel et al (2001). They found significant difference in term of bladder inflammation, bladder capacity and resected weight of prostate. Where as present study revealed statistical significant difference in both groups only in term of bladder capacity ($P < .001$) but not in mucosal congestion ($P < .148$) and resected weight of prostate ($P < .794$).

Resection time of more than 1 hour was observed in 4 (13.3%) patients of group A and 12 (40%) patients of group B. Resection time was found to differ significantly between groups (P value $< .02$).

On post operative follow up 2 patients of group A and 6 patient of group B were found pyrexia ($> 38^{\circ}\text{C}$). No significant different was observed in term of post operative pyrexia between two groups. Patel et al. also support this finding. They found 3 out of 18 patient of CISC group and 5 out of 12 patients of IDC group were pyrexia during the postoperative course. This result was also not significant ($p > .05$).

In the CISC group of Patel et al. 11 of the 34 patients had developed a UTI during the brief period of catheterization. 8 of 11 patients with UTIs were able to clear their infection at the end of their catheterization of before TURP. So in the period of CISC total 3 (11.3) patients ultimately failed to clear their infection. This percentage in the present study 10% in CISC group. . (5) in their study to compare the complications especially infection in two groups; those performing clean intermittent self-cathetrization (CISC) and patients with indwelling catheters, 3 (13.3%) patients out of 40 belonged to CISC group developed symptomatic infections proven by urine culture and follow-up period was 6 months. So the frequency of UTIs in CISC group is almost similar in all these three recent trails. The present results validated the policy of offering CISC to all men in AUR, showing that it is both safe if well managed and may reduce the complications related with IDC and make TURP easier to the surgeon.

Conclusion

CISC is managed and accepted well by patients who can use the technique. From the current study it may be suggested that CISC is better technique for management of AUR patient due to BPH than IDC. It can also be very helpful when surgery must be delayed or avoided due to any reasons in this group of patients.

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