

Self Clean Intermittent Catheterisation Two Years Follow-up Study

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One hundred and thirty-six traumatic paraplegia patients with neurological dysfunction of the bladder were trained in the technique of self-clean intermittent catheterisation at Rehabilitation Research Centre, S. M. S. Medical College Hospital, Jaipur. One hundred and eighteen were males and eighteen were females. Although all of them mastered the technique, twelve patients had to be discontinued from the programme for various reasons (ten males and two females) while still hospitalised, rest all continued on self-clean intermittent catheterisation after discharge from the hospital and were followed up for a period of two years.

The infection rate during self-clean intermittent catheterisation is low and most patients welcome the advantage of freedom from drainage bag, the rural paraplegic is also spared of travelling for long distances to the Primary Health Centre for changing or irrigation of blocked indwelling catheters frequently. However, the patient must be both well motivated and independent in transfers to be able to continue indefinitely with such¹a programme.

INTRODUCTION

Sterile intermittent urethral catheterisation has been used for a long time as a means of initial management of patients with neurological dysfunctions of the bladder since it was introduced by Guttman in 1966. Later on it was widely used as a bladder retraining technique during the rehabilitation phase of patients with neurological diseases who, had been wearing Foley's catheter. Nearly 12 years ago, Lapidès and his co-workers introduced the concept of self clean intermittent catheterisation as a permanent method of emptying the bladder for patients with various neurological dysfunction².

In the paraplegia centre of Rehabilitation Research Centre, S. M. S. Hospital, Jaipur, sterile intermittent urethral catheterisation is being used as a bladder retraining procedure for

the last 3 years. A large number of patients in whom satisfactory method of evacuation of bladder could not be developed, were discharged with an indwelling self retaining catheter.

This group of patients faced the greatest difficulties as a large number of them were from rural areas where even primary health care was not available and they had to travel long distances to primary health centre for change of catheter or irrigation of a blocked catheter. This frequent shuttling from their village to primary health centre and back led to development of large pressure sores accompanied by severe urinary tract infection. Ultimately they land up at the centre as severely ill patients. In view of these problems, a self clean intermittent catheterisation programme for management of neurogenic bladder has been started in this centre.

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MATERIAL AND METHODS

We began using this method since 1st January, 1984 and since then the one hundred thirty-six traumatic paraplegia patients have been trained in this technique but only one hundred and twelve of them have reported for regular follow up and the present report describes our experience with hundred and three male and nine female patients. In twelve patients the training had to be stopped in between due to various reasons.

All the traumatic paraplegia patients with bladder dysfunction, who were able to use the hands freely were considered for this training. However, some patients had to be rejected at the outset on account of obesity or severe autonomic dysreflexia.

All the patients in this series were already hospitalised and all were wearing Foley's indwelling catheter for a variable period ranging from three weeks to two months. No urodynamic studies were conducted to formally classify the bladders, as the ideology behind the study was to provide the self clean intermittent catheterisation as a permanent method of evacuation of bladder for both types of bladder.

The self intermittent catheterisation programme was started only after urine of the patient was found sterile on three subsequent cultures with urine having less than 100 CFU/ml with less than 5 WBC/HPF of spun urine.

The Foley's catheter was removed early in the morning on the first day and urine was sent for urine analysis and culture. The Senior Registrar then visited the patient and instructed the patient on the procedure to be followed. The patient was also instructed on fluid restriction and was given a fluid out-put record sheet making it obligatory on him/her getting it filled every time he or she emptied the bladder or voids incontinently. The patient was then catheterised. In case of female patient, the patient was placed in a lithotomy position and

a mirror was placed so the patient could see what is being done.

After this demonstration the patient was asked to perform all subsequent catheterisations himself or herself in bed under supervision, using a clean dry catheter (washed with soap and water) and lignocain jelly as lubricant. The patients catheterised themselves four times a day at 6 A.M., 12 Noon, 5.30 P.M. and 11 P.M. The fluid intake was restricted to 125 ml per hour from 6 A.M. to 10 P.M. totalling 2000 ml per day.

Twenty patients had reflex detrusor activity and were treated with Imipramine hydrochloride 75 mg per day for a week. It did not interfere with their sleep and kept the patients dry. In the following week, the dose of the drug was adjusted according to the need of the patient.

All the patients had sterile urine at the start of self clean intermittent catheterisation programme, urinary infections have been treated with a specifically indicated antibacterial drug before starting the training programme. No antibacterial drug was used as prophylactic during the treatment unless the patient developed signs of urinary tract infection.

Weekly cultures, and urine analysis with sediment examination were performed on all the patients while in the hospital. Following discharge the patients attended the out-patient clinic at an interval of eight to ten weeks. At the time of follow-up urine culture and urine analysis with sedimentation were performed in each case. In addition, patients were encouraged to attend the out-patient clinic or bring urine specimen at any time if they had any indications of infection i.e. loss of continence or change in character of the urine. 6 months after discharge, pyelogram & serum creatinine values were obtained.

OBSERVATIONS

One hundred & twenty-four patients successfully completed the training and were

discharged. Only one hundred and twelve (103 males and 9 females) of them reported for regular follow up.

The male patients became proficient in the technique of self catheterisation on an average in one day and female became proficient on an average in 7 days. Average stay of the patient after they became proficient in the technique of self catheterisation was on an average 1 month for other rehabilitation purposes.

There were no incidents of febrile urinary infections while the patients were in hospital nor during the follow up period.

Table I. Results in 112 Cases of Traumatic Paraplegia

No. of Pts.	Period of Catheterisation		No. of Patients developed Bacteriurea	
	Indwelling	Self Intermittent	In Hospital	Follow up
5	4 weeks	80-90 weeks	1	2 (1)*
4	4-8 weeks	80-90 "	3	4 (1)*
4	4 "	70-79 "	—	2
6	4-8 "	70-79 "	4	4 (2)*
4	4 "	60-69 "	1	2 (1)*
8	4-8 "	60-69 "	3	6 (2)*
4	4 "	50-59 "	1	2 (1)*
6	4-8 "	50-59 "	2	4 (1)*
7	4 "	40-49 "	2	3 (1)*
6	4-8 "	40-49 "	4	6 (2)
8	4 "	30-39 "	1	4
7	4-8 "	30-39 "	2	5 (2)*
8	4 "	20-29 "	1	3
6	4-8 "	20-29 "	2	4 (2)*
11	4 "	10-19 "	2	2
6	4-8 "	10-19 "	3 (1)*	3 (1)*
8	4 "	0-9 "	—	—
4	4-8 "	0-9 "	2	—

*The number in brackets are the number of those patients who developed bacteriurea more than once during the period of study.

Table II. Antibacterial drugs given to patients on self intermittent catheterisation when they developed significant bacteriurea

	MM	Nf	TMP-SMZ	Other
In Hospital	6	10	12	6
In follow up	8	28	20	12

MM — Methenamine Mandate 1 gm QID.

Nf — Nitrofurantoin 50 mg 12 hourly.

TMP — SMZ—Trimethoprim—sulfamethoxazole 1 tab. 12 hourly.

During hospitalisation 34 patients out of 124 who entered the study, developed significant bacteriurea with more than 1 lakh C. F.U./ml with more than 20 KBC/HPF of spun urine. A 15 days course of specific antibacterial therapy was given for each infection case and there were no recurrence except in the case of middle aged rather obese lady, who experienced two incidents of *E. coli* bacteriurea at intervals of 3 weeks.

In the present study patients are available for follow up study for a period of 2 months to two years. 56 patients were seen on routine follow up visits to have significant bacteriurea, 17 of the 56 patients had two such incidents.

Both in-hospital and the out-patients clinic, the most commonly isolated organism was *E. coli* with lesser number of *Proteus* and *Klebsiella* and an isolated incident of *Citrobacter* bacteriurea.

Dilatation of the ureter and pelvis of kidney was observed in two patients. Intermittent catheterisation was continued in both the patients. On subsequent visit pyelogram was repeated and a trend towards normalisation of the size of ureter and pelvis of kidney was observed in both the patients. We have seen no urinary calculi developing during intermittent catheterisation. Eight patients had a single incidence of haematuria without any identifiable cause. Patients who were on indwelling catheter for

more than 4 weeks had more incidence of bacteriurea than those who were on indwelling catheter for less than four weeks.

DISCUSSION

This study was conducted on the hypothesis postulated by Lapidès et al.² that most cases of urinary tract infection are due to some underlying structural or functional abnormality of the urogenital tract which leads to decreased resistance of tissue to bacterial invasion. The urothelium or renal parenchyma can be affected through damage to its structural integrity by neoplasm, calculi, foreign bodies such as inlying catheters, traumatic instrumentation and so forth. However, the most common cause for increased susceptibility to bacterial invasion is decreased blood flow to the tissue. Blood flow to the bladder can be reduced by increased intravesical pressure and/or by over distension of the organ. The resulting ischemic bladder tissue is then prey to invading gram negative organisms from the patient's own gut via the hematogenous or lymphogenous route. Transient bacteremia is believed to be a common phenomenon in healthy individuals. In the female patients poor voiding, is the primary cause of cystitis whereas obstruction is the leading cause in the male patients. Thus it can be inferred from our theory that the maintenance of a good blood supply to the renal pelvis, ureter, bladder and urethra by avoiding high intraluminal pressure and over distension is the key to prevention of urinary tract infection. Residual urine in itself and organisms supposedly ascending through the urethra are of doubtful importance in the genesis of urinary infection. Results of the present study are quite in conformity of this hypothesis.

The most commonly isolated organism from the urine in the present study as well as in the study conducted by Elizabeth Joiner et al.⁴ was *E. coli*, this common finding provides further credence to the hypothesis of Lapidès et al.

The technique of self intermittent catheterisation is easy to learn as in the present study, male patients took only a day and female patients took only seven days to become proficient. This fact has been well emphasised in the studies conducted by Lapidès et al.² and by Elizabeth Joiner et al.⁴ The ease in learning the technique lies in uncomplicated instruction and simple instrumentation. Sterile intermittent urethral catheterisation as advocated by Guttman¹ never became popular in India and this part of World since it was believed that not enough physicians were available to perform the number of daily catheterisation in the manner suggested.

Fewer patients developed bacteriurea within the present series as compared to the study conducted by Elizabeth Joiner et al.⁴ It appears to be due to the fact that in her study all the patients were females only, but in the present study the number of male patients is much larger.

Dilatation of ureter and pelvis of kidney were seen in two patients in the present series and both of them showed trends towards normalisation. As the follow-up of our patients was short, our results in this regard are not as good as in the study by Elizabeth Joiner⁴ where the pyelogram returned to normal after a longer follow-up. An interesting observation was that the patients who were on indwelling catheter for more than four weeks, suffered more with incidence of bacteriurea in follow-up period. This observation is difficult to explain and may be due to residual effect of the trauma which the bladder sustained during the period patient was on indwelling catheter.

The sole idea with which we adopted to self clean intermittent catheterisation was to some how relieve our rural paraplegic patients of the problems faced by them due to indwelling catheters. The significant reduction in urinary tract infection rate, which led to reduction of the cost of antimicrobial drugs from the total cost of treatment was, however, a welcome spin off. It

not only cuts on the cost of antibiotics but spared these patients from frequent visits to distant primary health centres for change of catheters and irrigation of blocked catheter. The patients acceptability of the procedure is very high. Under Indian scenario where a large number of traumatic paraplegia patients come from rural

area, we feel that it is a fairly good procedure of evacuation of bladder and control of large number of urinary tract complications which develop following this condition. The patients are also relieved of carrying an indwelling catheter and drainage bag, making them more socially acceptable.

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