

EFFICACY OF CHLORHEXIDINE AS A BLADDER IRRIGANT IN MINIMIZING LOWER URINARY TRACT INFECTION AFTER ENDOSCOPIC PROCEDURES

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ABSTRACT

This study involved 180 patients admitted for transurethral endoscopic manipulations either diagnostic or therapeutic. All patients entered the study have sterile urine as proved by bacterial counting in mid-stream urine samples below 10^5 /ml. Patients were divided into two groups; 90 patients for each. Treatment group, those receiving intravesical instillation of 100 ml. of 0.05% Chlorhexidine digluconate in sterile water that was retained in the bladder for 10 minutes before recommending free-drainage, twice daily postoperatively as long as the catheter in place. Control group; those were receiving normal saline for intravesical irrigation. In patients with catheter remaining less than two days; infection was found in catheter specimen and mid-stream urine after catheter removal in 19.35% and 12% respectively in comparison with the control group 27.6% and 40%. While those patients with catheter remaining more than two days; infection was found in catheter specimens and mid-stream urine after catheter removal in 22% and 5.2%. Respectively in comparison with the control group (27.9% and 22.7) We conclude that chlorhexidine is effective in minimizing post operative bacteriuria especially in those patients keeping the catheter for less than two days. No local or systemic complications has been reported.

INTRODUCTION

Urinary tract infection is the term reserved by many authors for bacteriuria associated with symptoms or signs of infection within the urinary tract. Urinary tract infection is one of the most common serious problems that a urologist can face after transurethral endoscopic procedures. Prophylaxis alternatively is designed to

prevent infection likely to occur in a particular clinical setting (Andrew, 1987).

Washing the bladder with installations of antiseptics has been advocated as a method of controlling urinary tract infection in patients with indwelling catheters. The activities of the irrigant antiseptics :

povidine-iodine, phenoxyethanol, neomycin and neomycin-polymyxin were administered through closed urinary catheters and examined against selected species of uropathogens. While reduction in the numbers of the urinary organisms and control of infections may be sometimes achieved (Garrad, et al., 1981), the ration-

al for the use of antiseptics in this way is not well established.

In the present work we tried to study the effect of chlorhexidine intravesical instillation to minimize bacteruria that occur after transurethral endoscopic procedures.

PATIENTS & METHODS

The present study includes 180 patient that were admitted for endoscopic manipulations either diagnostic or therapeutic.

Patients entering the study should have sterile urine as proved by the results of bacterial counting in mid-stream samples of urine, figures above 10^5 /ml are considered infected. Patients with persistent source of infection e.g. those with refluxing ureters; were excluded. Patients who had sterile urine but received antibiotics for any other reason were completely excluded.

Patients were divided into two groups, 90 patients for each :

1. Treatment group : those were receiving intravesical chlorhexidine postoperatively.
2. Control group : those were receiving normal saline for intravesical irrigation.

All patients were subjected to the following scheme preoperatively :

1. Complete urologic examination including history taking general and abdominal examination.
- 2- Laboratory investi-

gations :

- a) Complete urine analysis.
 - b) Urine culture : including bacterial count, patients with bacterial count less than 10^5 /ml in mid stream sample were allowed to enter the study. Patients with bacterial count of 10^4 /ml in catheter specimen were considered infected.
 - c) Blood : complete blood picture, blood sugar and serum creatinine.
3. Radiological examination : Plain x-ray of the abdomen and pelvis and intravenous urography.
 4. Abdominal sonography .

Operative work :

Patients with sterile urine preoperatively were selected to enter the trial as ruled by bacterial counting less than 10^5 /ml, no prophylactic systemic antibiotics were used.

At operation a solution of 0.05% chlorhexidine in glycerol to lubricate the endoscope.

At the end of operation, the indwelling

3 ways Foley's catheter was connected to a plastic drainage vessel and the other channel to a container of sterile water bag.

In the first group (treatment group) : the patient received a twice daily instillation of 100 ml sterile solution of 0.05% chlorhexidine digluconate in sterile distilled water. It was retained in the bladder for 10 minutes before recommending free-drainage; the process was repeated daily so long the catheter in place. The duration of catheter stay variable for 1-5 days according to the nature of the procedure

done.

In the second group (control group) : the patient will receive a twice daily instillation of 100 ml sterile normal saline for bladder irrigation postoperatively.

Urine specimens for catheter were obtained 12 days pre-operatively, from the endoscope at operation and subsequently by sterile needle from the sampling point on the drainage tube at alternate days and once again two days after removal of the catheter.

RESULTS

This study was carried out on 180 patients age of 20-60 years with a mean age between 35 years; males were 141 patients and femals were 39 patients.

All patients underwent transurethral endoscopic procedures either diagnostic or therapeutic, table (1).

Table (1) : Endoscopic procedures done for studied patients :

Endoscopic procedures	Treatment group		Control group	
	No. of patients	%	No. of patients	%
1. Diagnostic cysto-urethroscopy	40	44.4%	40	44.4%
2. Cystoscopy + Litholapaxy	15	16.6%	15	16.6%
3. Ureteroscopy	10	11.11%	12	13.3%
4. Ureteroscopy + stone extraction	25	27.7%	23	25.7%
Total	90	100%	90	100%

A) Patients with catheter remained less than two days :

Infection was found in catheter specimens and mid-stream urine after catheter

removal in 19.35% and 12%. respectively, in comparison with the control group 27.6% and 40% (table 2.3).

Table (2) : Bacterial count in catheter specimens in patients with catheter remained less than two days :

Bacterial count	Treatment group		Control group	
	No. of patients	%	No. of patients	%
> 10^4 /ml	6	19.35%	8	27.6%
< 10^4 /ml	25	80.65%	21	72.4%
Total	31	100%	29	100%
P	< 0.02			

Table (3) : Bacterial count in mid-stream urine after catheter removal in patients with catheter remained less than two days :

Bacterial count	Treatment group		Control group	
	No. of patients	%	No. of patients	%
> 10^5 /ml	3	12%	6	40%
< 10^5 /ml	22	88%	15	60%
Total	25	100%	21	100%
P	< 0.001			

B) Patients with catheter remaining more than two days :

Infection was found in catheter specimens and mid-stream urine after catheter

removal in 22% and 15.2% respectively; in comparison with the control group 27.9% and 22.7% (table 4,5).

Table (4) : Bacterial count in catheter specimen in patients with catheter remained more than two days :

Bacterial count	Treatment group		Control group	
	No. of patients	%	No. of patients	%
> 10 ⁴ /ml	13	22%	17	27.9%
< 10 ⁴ /ml	46	78%	44	72.1%
Total	59	100%	61	100%
P	< 0.05			

Table (5) : Bacterial count in mid-stream urine after catheter removal in patients with catheter remained more than two days :

Bacterial count	Treatment group		Control group	
	No. of patients	%	No. of patients	%
> 10 ⁵ /ml	10	15.2%	16	22.7%
< 10 ⁵ /ml	55	84.8%	53	77.3%
Total	65	100%	69	100%
P	< 0.02			

Chlorhexidine was found to be effective in controlling infection in both catheter specimen and mid-stream urine after

catheter removal in those patients with catheter remaining less than two days, (table 6, 7).

Table (6) : Infection in catheter specimen in patients with catheter remained less than and more than two days :

Bacterial count	Catheter remained less than two days	Catheter remained more than two days
$\geq 10^4$ /ml	19.35%	22%
P		- < 0.05

Infection was diagnosed at any time when the viable bacterial count of 10^4 /ml

in catheter specimen or 10^5 /ml in mid-stream urine.

Table (7) : Infection in mid-stream urine after catheter removal in patients with catheter remained less than and more than 2 days

Bacterial count	Catheter remained less than two days	Catheter remained more than two days
$\geq 10^5$ /ml	12%	15.2%
P		<0.02

DISCUSSION

Clinicians and microbiologists have tried to overcome the problem of catheter associated urinary tract infection by improving the prevention, control and treatment of these infections, such approaches have included the avoidance of unnecessary catheterization, the use of closed sterile drainage and the observance of septic techniques in catheter handling. These

measures have reduced the incidence or delayed the onset of catheter associated infections but have failed to eradicate the problem completely (Elliot, et al., 1989). The mucosa is an important host defense against the development of infection and should the urothelium be damaged during long-term catheterization and chronic urinary tract infection. It is possible that uro-

thelial damage occur after bladder wash-out: (Elliot et al., 1989, 1987). Chlorhexidine is an effective local urinary antiseptic (Gillespie et al., 1962) with low toxicity. Haematuria has been reported after its use as a bladder irrigant and prolonged instillation can cause erosive cystitis in rats (Harper and Matz, 1975). This is may be attributed to the use of a higher concentration of chlorhexidine than we tried in our study. In the study of by Andrew (1987) measurements of broad levels of the drug proved that the drug was not absorbed systemically. In our study the incidence of postoperative infection had reduced to 45.5% in control group and to 32.2% in treatment group. We had observed that the effect was significant in patients keeping their catheter for less than two days, it was

29% in the treatment group and 48.3% in the control group. While the effect of the drug was less significant in those patients keeping the catheter for more than two days: as infection was 33.9% in treatment group and 44.3% in control group. John et al. (1978) has used antibiotic irrigation (neomycin-polymyxin) in preventing catheter associated urinary tract infection, infection was found in 18% of patients not given her irrigant and 16% in patients given the irrigant. So, we might expect that the effect of chlorhexidine irrigation may reduce the incidence of postoperative bacteriuria, a conclusion which might be delt cautiously as the irrigation effect on the bladder mucosa may be harmful especially when the mucosa is already ill.

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