

INCIDENCE OF URINARY INFECTION IN OPERATED PATIENTS (SINGLE CATHETERISATION AND INDWELLING CATHETERISATION CASES)

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Summary

A prospective study of incidence of urinary infection was done in 40 cases of single catheterisation and 35 cases of indwelling catheterisation cases. All the cases had major surgical procedure. Three samples of urine were taken for study, first just before operation, second 48 hours after and third 7 days post-operative in indwelling catheter cases. First sample was negative in all the cases, second sample showed 10% and 17.1% incidence in group I and group II respectively. Third sample showed 62.8% incidence of positive cultures.

Higher incidence of 10% and 17.1% was found probably due to surgical trauma to bladder. Lower incidence of 62.8% was possibly due to closed drainage system used for all the cases.

Introduction

The urinary catheter for draining the bladder has been established as an essential instrument in the practice of modern medicine (Shapiro et al., 1974). Because of the well-known acknowledged risks of catheter induced urinary infection it was thought appropriate to undertake a study to assess and estimate the incidence of urinary infection after a single catheterisation and indwelling catheter in operated patients. An attempt was also made to find out the causative organisms and response to drugs.

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Material and Method

The present study was based on 75 cases (40 patients of single insertion and 35 cases of indwelling catheter). Any patient having possible history of previous urinary tract infection was excluded from the study.

Catheterisation was done as aseptically as possible after putting on sterile gloves. The external genitalia were swabbed with betadine and subsequently swabbed with sterile normal saline to avoid traces of the anti-septic contaminating the urine samples.

Just before operation, a sample of urine was collected by the catheter into a

sterile culture tube for quantitative microscopic, bacteriologic and sensitivity examination. The sample was labelled as first specimen of urine.

Second specimen of urine was collected in the sterile culture tubes 48 hours post-operative in both the groups. In indwelling catheter group, a third sample was collected 7 days after the first specimen.

The urine samples were cultured at the earliest to prevent multiplication of opportunistic bacteria which could rapidly out-grow the organisms causing the infection.

Results and Observations

The first specimen of all the cases did not show growth of any bacteria.

Second specimen of single catheterisation group showed 10% incidence of urinary infection. Whereas in indwelling catheterisation cases the incidence was 17.1% (Table I).

TABLE - I
SHOWING INCIDENCE OF URINARY INFECTION IN 2ND SPECIMEN.

Type of catheterisation	Total number of cases	Positive culture	Percentage
Single	40	4	10.0
Indwelling	35	6	17.1

Twenty two patients out of 35 cases showed positive cultures in the third specimen giving the incidence at 62.8% (Table II).

TABLE - II
SHOWING INCIDENCE OF URINARY INFECTION IN 3RD SPECIMEN.

Type of catheterisation	Total number of cases	Positive cultures	Percentage
Indwelling	35	22	62.8

Three positive cultures of second specimen were common with positive cultures in third sample whereas 3 positive cultures of second sample did not show any growth of bacteria in third sample.

Isolates

Table III shows the type of isolates in second and third samples in both the groups.

Escherichia coli was isolated in 50% of the cases in group I, 83.3% of cases in group II in the second sample and 59.1% of cases in group II third sample. Klebsiella Sp. was isolated in 25% of cases in group I, 27.3% of cases in group II third sample. Proteus Sp. was isolated in 25% of cases in group I, 16.7% of case in group II third sample whereas Klebsiella and Proteus

TABLE - III
SHOWING THE TYPE OF ISOLATES IN 2ND AND 3RD SAMPLES IN BOTH GROUPS

Organisms	Single catheterisation group I (48 hours) post-operative	Indwelling catheterisation group II	
		48 hours post-operative	7 days post-operative
E.coli	2 (50%)	5(83.3%)	13(59%)
Klebsiella Sp.	1(25%)	—	6(27.3%)
Proteus	1(25%)	1(6.7%)	2(9.1%)
Klebsiella & Proteus Sp.	—	—	1(4.5%)
Total	4	6	22

were isolated only in 1(4.5%) case in group Ii third sample.

Anti-biotic sensitivity of isolates:

Sensitivity pattern shows *E. coli* which was the commonest isolate most sensitive to cephalixin i.e. 80% of organisms were sensitive to drug. Cephalixin again was the most potent anti-biotic for *Klebsiella* showing 62.5% sensitivity. *Proteus* group was most sensitive to nalidixic acid showing 100% sensitivity (Table IV).

The present study included both obstetrical and gynaecological cases taken at random and on whom major abdominal surgery was done. Bladder needed to be reflected in all the cases giving rise to bladder trauma. The incidence of 10% urinary infection could be explained on the basis of surgical trauma which is a factor giving rise to higher positive cultures as reported by Lash (1967).

The present study on indwelling

TABLE - IV
SHOWING THE ANTI-BIOTIC SENSITIVITY OF ORGANISMS ISOLATED

Organism	Total	Ampicillin	Cephalixin	Gentamycin	Tetracycline	Nalidixic acid	Nitrofurantoin
<i>E. coli</i>	20	1(5%)	16(80%)	8(40%)	2(10%)	11(55%)	13(65%)
<i>Klebsiella</i> Sp.	8	2(25%)	5(62.5%)	3(37.5%)	1(12.5%)	5(62.5%)	2(25%)
<i>Proteus</i> Sp.	5	1(20%)	4(80%)	4(80%)	1(25%)	5(100%)	1(20%)

Discussion

Catheterisation is a potent cause of urinary infection, source of infection may be from improperly sterilised catheter, re-contaminated catheter, faulty handling, micro-organism from distal urethra or introitus, rising air bubbles in the tube of an indwelling catheter or through the film of mucopus between catheter and the urethral wall. Opinions have differed on the quantum of harm done by infection and efforts made to minimise it.

The incidence of 10% infection following single catheterisation is much higher than that reported by most of previous authors (2-5.5%) inspite of the fact that urethral meatus was swabbed with betadine and later with saline before the insertion of catheter. Only Slade and Linton (1960) have reported a higher incidence of 29% in complicated labour cases.

catheterisation cases (closed drainage) with positive culture incidence of 17.1% in second specimen and 62.8% in third specimen with an overall incidence of positive cultures at 71.3% is similar to that reported by Paterson et al (1960); Donald et al (1962); Hawkin et al (1962), Pathak et al (1968) and Sansford et al (1969).

Kass (1957) has reported 100% incidence in 4 days post-operative cases, Gillespie et al (1960) reported 98% incidence in open drainage bladder cases which is much higher than our incidence. Asthna and Kishore (1965), Garibaldi et al (1974) studies show almost similar incidence when calculated seven days post-operative. It is inferred that closed drainage with indwelling catheter gives rise to infection at definitely a lower rate than open drainage system.

Most frequent isolate in present study