

# Comparative study of short term versus long term antibiotic prophylaxis in obstetrics & gynaecological major surgery

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**Summary :** An open randomised single blind study of the efficacy and safety of Cefotaxime single dose (Group-I) pre-operative prophylaxis in comparison with the routinely practiced long term post-operative Ampicillin prophylaxis (Group-II) was carried out enrolling 200 patients undergoing obstetric and gynaecological major surgery.

The incidence of wound infection and UTI in Group-I v/s Group-II was 4% v/s 16% and 2% v/s 22%. The incidence of febrile morbidity, phlebitis and adverse reactions in the two groups were 4% v/s 24%, 5% v/s 15% and 1% v/s 15%, respectively.

Thus single dose Cefotaxime prophylaxis is effective, safe, convenient and saves manpower, thus preventing irregularity in administering drugs which is likely and can easily replace the seven day extended use of drugs.

## Introduction:

One of the most common complication of surgery is infection. It could be due to invasion of damaged tissue by organisms harboured by the patient or due to cross infection from other patients or due to faulty aseptic technique. Prophylactic antibiotics in surgery are intended to prevent morbidity and mortality as well as to reduce the duration and cost of hospitalisation.

Surgical infections involve aerobes, anaerobes and facultative organisms. Production of beta lactamase is the commonest reason for their resistance to lactum antibiotics. Cefotaxime a third generation cephalosporin with its wide antibacterial spectrum and minimal side effects offers a good concept in the treatment of polymicrobial infections.

## Aims & Objectives :

1. To assess the effectiveness of Cefotaxime as a single dose prophylaxis.
2. To compare it with Ampicillin which is being used presently for seven days post-operatively.
3. To reduce the total requirement, cost and duration of hospitalisation in major surgery cases.

## Material and Methods :

This study was carried out in the Department of Obstetrics & Gynaecology, Jawaharlal Nehru Medical College, District Hospital, Belgaum. Two hundred cases of elective and emergency obstetric and gynaecological major surgery were included in this study. Exclusion criteria were cases with pre-existing infection, prior intake of antibiotics, diabetes, hepatic or renal disorders, PROM >6 hours and patients on immunosuppressants.

The cases were divided into 2 groups. Group-I 100 cases, were given Cefotaxime 1 gm. pre-operatively. Group-II of 100 cases, were given post-operative Ampicillin 500 mg. 6 hourly for seven days.

Post operative outcome by noting temperature, wound status, complications and adverse effects were compared in both the groups. Duration of hospitalisation and cost effectiveness were also noted in both the groups.

## Observations:

The type of surgery performed is shown in Table-I in both the groups. Table-II compares the post operative complications in both the groups.

Additional antibiotics were instituted by culture

Table - I

Operation	Group-I	Group-II
Vaginal Hysterectomy	30	33
Abdominal Hysterectomy	26	26
LSCS	41	39
Miscellaneous <sup>†</sup>	03	02
<b>Total</b>	<b>100</b>	<b>100</b>

\*Myomectomy

†Laparotomy

Excision of soft tissue tumors

Table II

## Post operative complications

Complications	Group-I	Group-II	'P' Value
Temperature	04	24	0.001
UTI (Culture Proved)	02	22	0.001
Wound infection (Culture Proved)	04	16	0.003
Phlebitis	05	15	0.005
Vomiting	01	05	0.100
Loose Motions		10	0.001

(\*P' Value 0.005 - Statistically significant)

Table III

## Microorganisms isolated from infected wounds

Microorganisms	Group-I	Group-II
Staphylococcus aureus	02	08
E. coli	01	06
Proteus	01	01
Corynebacterium hemolyticum		01
<b>Total</b>	<b>04</b>	<b>16</b>

sensitivity report. Incidence of wound infection and UTI were higher in Group II as compared to Group-I, 16% v/s 4% and 22% v/s 2%, respectively.

Table - IV

## Profile of organisms isolated from U. T.I.

Microorganisms	Group-I	Group-II
E. coli	02	17
Staphylococcus aureus	-	17
Proteus	-	01
Pseudomonas	-	03
<b>Total</b>	<b>02</b>	<b>22</b>

Table V

## Patient cost in both groups

Drugs	Dose/Schedule	Drug cost
Cefotaxime	1 gm. single dose pre-op IV	Rs. 84/-
Ampicillin	Inj. 500 mg 6 hr. x 2 days	Rs. 232/-
	Cap. 500 mg 6 hr. x 5 days Post-op	

Culture reports of infected wounds and urine are shown in Table-III and Table-IV, respectively. The major organism isolated in wound infections was Staphylococcus aureus (50%) and in UTI E. coli (70%). Majority of these organisms were resistant to Ampicillin (90%).

Febrile morbidity was 4% v/s 24% and adverse reactions 1% v/s 15% in both Group-I and Group-II. With high vaginal swabs the most common organism isolated was Staphylococcus aureus.

The rate of wound infection in our series of 200 patients was 10%.

Duration of hospitalisation in Group I who underwent vaginal hysterectomy was reduced (post operative stay). Incidence of wound infection was 16% for LSCS, 17% for abdominal hysterectomy and 6% for vaginal hysterectomy.

The cost of drug therapy was approximately tripled in Group-II as shown in Table-V, excluding additional drug therapy, dressings and handling time for infected cases.

### **Discussion:**

Obstetrical and gynaecological major surgeries and procedures with their close proximity to the vagina which is a reservoir of potential pathogens carries significant risk of infectious morbidity.

Ledger (1993), proposed a set of guidelines for successful chemoprophylaxis in obstetric and gynaecological surgeries. A few of these guidelines are (1) they (antibiotics) should have laboratory evidence of effectiveness against most major if not all pathogens; (2) they should be present in the wound in an effective concentration at the time of incision; (3) low toxicity regimen of antibiotics must outweigh the potential dangers of their use routinely.

Different antibiotics have been used for prophylaxis like ampicillin, augmentin, amoxicillin, metronidazole, penicillin, gentamycin, cephalosporins etc.

There is now good evidence that single dose prophylaxis given just before surgery confers as much protection against post-operative sepsis as do more prolonged courses. Hemiell et al (1987), summarised the benefits of a single dose therapy as less expensive; less likely to encourage development of resistant bacteria; need for less nursing and pharmacy resources; and less likely to cause toxicity and allergic reactions.

Extended courses can be kept for cases requiring prolonged surgical procedures and in those having catheterization post-operatively.

Cefotaxime is well tolerated after IM or IV injections. Moreover experience of various investigations indicates that single dose regimen of cephalosporins equally tried gives as efficacious results in prophylaxis as do regimes of multiple doses. They also have added advantages of safety and tolerance.

Moreover the relatively short half life of these agents may be an added advantage because the impact of the antibiotic on the normal flora of the patient and the environment would be less compared with that of drugs with longer half life.

In the present study, short course of prophylactic single dose antibiotic Cefotaxime has been documented to be more effective in controlling tissue inflammatory response when started pre-operatively as compared to traditional use of antibiotic ampicillin.

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