

**COMPARISON OF PROPHYLACTIC  
VS  
REGULAR USE OF ANTIBIOTIC  
IN CAESAREAN SECTION**

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**MADRAS MEDICAL COLLEGE**

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## CERTIFICATE

This is to certify that the dissertation entitled “ **COMPARISON OF PROPHYLACTIC VERSUS REGULAR USE OF ANTIBIOTIC IN CAESAREAN SECTION**” is a bonafide work done by **Dr.M.DEEPAMANGALAM** in the Institute of Social Obstetrics, Govt. Kasturba Gandhi hospital (Madras Medical College) Triplicane , Chennai in partial fulfillment of the university rules and regulations for award of MD degree in Obstetrics and Gynecology under my guidance and supervision during the academic year 2010-2013.

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# **INTRODUCTION**

## INTRODUCTION

Caesarean section is the most important risk factor for puerperal infection. Infectious complications following surgery are significant cause of morbidity and mortality. These include post-partum fever, urinary tract infection, respiratory infection, wound infection, vaginal infections and sepsis. All these complications in turn lead to increased usage of antibiotics, prolonged hospital stay, increased health costs and development of resistance to these antibiotics. Women who undergo caesarean section are at 5 to 20 fold increased risk of these infectious complications when compared to normal vaginal delivery. The present study is to evaluate the effectiveness of prophylactic antibiotic in reducing the infectious morbidity, mortality as well as effectiveness in reducing duration and cost of hospitalization.

# **AIM OF THE STUDY**



## **AIM OF STUDY**

- 1) To compare the effectiveness of prophylactic antibiotics over regular post-operative antibiotic usage in preventing post-operative morbidity in terms of fever, urinary tract infection, wound sepsis, vaginal infection in patients undergoing both elective and emergency clean caesarean section.

# **REVIEW OF LITERATURE**

## REVIEW OF LITERATURE

A large number of randomized trials have shown that a prophylactic antibiotic agent given at the time of caesarean delivery will decrease infectious morbidity in high-risk patients as well as in patients undergoing elective caesarean delivery (American College of Obstetricians and Gynecologist 2003)<sup>31</sup>.

Pelvic infection acquired post operatively is the most frequent cause of fever and develops in up to 20% of women despite peripartum prophylactic antibiotics (Goepfort and associates, 2001)<sup>32s</sup>

Gordon HR et al (1979) showed that prophylactic antibiotic initiated after cord clamping is equally effective in decreasing maternal morbidity as the antibiotic given prior to surgery.<sup>1</sup> He also concluded that transplacental passage of these antibiotics does not increase the incidence of neonatal infections.

Itskovitz et al (1979) showed that the postoperative infection can also be decreased by administering prophylactic antibiotics in the immediate postoperative period. Hence undesired placental transfer of the antibiotics to the fetus can be avoided.<sup>2</sup>

GALL SA (1979) Showed that prophylactic antibiotic administration is beneficial to the obstetric patient.<sup>3</sup>

Schilze G (1980) showed from his study that maternal infections were lower in the group given prophylactic antibiotics. <sup>4</sup>

Hawrylyshyn PA et al (1981) in his study on prophylactic antibiotics showed that they are aimed at decreasing postoperative morbidity <sup>5</sup>

Padilla et al (1983) in a randomized trial showed that there were no differences in the effectiveness of the antimicrobials whether given preoperatively or intraoperatively, but serious infections were not encountered in patients receiving prophylactic antimicrobial. <sup>6</sup>

Wallace RL (1983) showed that there was a significant decrease in the incidence of postoperative endomyometritis in patients receiving prophylactic antibiotics. This study suggested that patients who undergo emergency primary section benefit from a short course of prophylactic antibiotics. <sup>7</sup>

Periti P et al (1984) in their study of two short term antimicrobial prophylactic regimens in caesarean section involving a single dose of third generation long acting cephalosporin, Ceftriaxone with a multiple dose were equally effective. <sup>8</sup>

Jaffe R et al (1985) in their study on single dose antimicrobial prophylaxis in emergency caesarean section showed that the incidence of fever, endomyometritis and UTI were significantly decreased in the group who received prophylactic antibiotic. Other benefits of included shorter hospital stay and that serious infections in the group were reduced significantly. <sup>9</sup>

Saltzman DH et al (1985) showed that single dose antibiotic prophylaxis at the time of cord clamping significantly reduced the incidence of endomyometritis and fever in high risk patients undergoing caesarean section.<sup>10</sup>

Roex AJ et al (1986) in their study showed that short course antibiotic prophylaxis in caesarean section decreased the postoperative urinary tract infection, vaginal, wound infection and antibiotic therapy.<sup>11</sup>

Saltzman DH et al (1986) in their double blind prospective study compared the effectiveness of single dose of prophylactic antibiotic and multi-dose antibiotic prophylaxis for avoiding infections in high risk patients undergoing caesarean section. The single dose antibiotic was equally effective as three dose antibiotic.<sup>12</sup>

Duff P. (1987) in his study showed that a single dose antibiotic administered after cord clamping provides a degree of prophylaxis comparable to two and three dose antibiotic regimens.<sup>13</sup>

Mahomed K.(1988) in his study on 232 patients undergoing elective caesarean section, showed that the group receiving prophylactic antibiotic had fewer infections, morbid event and fewer fever and short hospital stay.<sup>14</sup>

Mancuso (1989) compared the efficacy of single dose (1 gm i.v) ceftriaxone administration in 175 patients undergoing elective caesarean section (113 patients) or emergency caesarean section (62 patients). The overall percentage of post-operative infectious morbidity was 8% (14/175), with 9.6% (6/62) of the

group undergoing emergency surgery and 7.0% (8/113) of the patients undergoing Elective caesarean section. <sup>15</sup>

Galask RP et al (1989) compared the effectiveness of single dose prophylactic antibiotic over multi- dose antibiotic and data suggest that routine multi-dose antibiotic prophylaxis could be replaced by a single dose regimen. <sup>16</sup>

Chan AC et al (1989) conducted a double blind prospective randomized trial at the Department of obstetrics and gynecology, the Chinese University of Hong Kong. This study involved 4 groups of patients receiving a single dose of placebo, intravenous ampicillin and metronidazole, ampicillin and sulbactam pre-operatively and showed no significant difference in post-operative morbidity between the 4 groups of patients. <sup>17</sup>

King C (1989) conducted a study on the various factors influencing the incidence of sepsis following Caesarean section and showed that all Caesarean section probably warrant prophylactic antimicrobial. These antimicrobials should be given parenterally in high doses, starting perioperatively. Single does have been found to be effective. Prophylactic antibiotic for caesarean section should be given preoperatively so as to ensure a high plasma concentration of antibiotic during the surgery. <sup>18</sup>

Mallaret et al (1990) did a study on 266 women who underwent caesarean section without any high risk of infection, in order to study the efficiency of prophylactic

antibiotics given intra- operatively. One group received 1 gm of cefotetan when the cord was being clamped and the other received an injection of placebo.

Prophylactic antibiotics were efficient because they reduced post-operative morbidity due to endomyometritis, superficial and deep abscesses and septicemia.

The duration of hospital stay was significantly reduced in the prophylactic antibiotic group.<sup>19</sup>

Oimitrov (1990) showed that antimicrobial prophylaxis was of no clinical significance in women undergoing low risk or uncomplicated caesarean sections.

The author recommends to restrain antibiotic prophylaxis for such women, in whom postoperative infections and inflammatory complications are anyway rare.

The frequency of postoperative infectious complication were 6.89% in women who received penicillin for a period of 3 to 5 days but 5.67% in women who did not receive any antibiotic prophylactically.<sup>20</sup>

Kristensen et al (1990) showed that single dose antibiotic prophylaxis administered after umbilical cord clamping in patients undergoing emergency caesarean sections significantly lowered the incidence of fever without producing any side effects.<sup>21</sup>

Howie PW et al (1990) in their study showed the efficiency of prophylactic antibiotics in caesarean section.<sup>22</sup>

Escobedo Labat et al (1991) compared long course ampicillin (7 days) to short course of ampicillin (3 doses) and placebo. 31 patients were included in

placebo and 60 patients in the drug groups. Only one patient in the placebo group and one patient in the drug group developed infections. There was no significant difference (P less than 0.001) between placebo and ampicillin groups.

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Ng NK, Sivalingam N (1992) in their study showed that prophylactic antibiotic appear to be beneficial and consideration to be given to make it a routine in all emergency sections.<sup>24</sup>

Sulovic V et al (1994) studied the effectiveness of prophylactic ceftriaxone in the post-operative complications following caesarean section and its effect on the neonate. There was lower incidence of complications associated with ceftriaxone than in patients with no antibiotic therapy. The new born whose mother received ceftriaxone had high Apgar scores.<sup>25</sup>

Wax JR et al (1997) in their study on showed that 1gm of Inj. Cefazolin given iv preoperatively is not much effective than the same dose administered after cord clamping in preventing post-operative infectious morbidity. 26

Huam SH et al (1997) in their trial studied the effectiveness of single dose prophylactic antibiotic in reducing the infectious morbidity. A single dose of prophylactic antibiotic reduced the post caesarean morbidity and length of hospital stay in women who underwent elective Caesarean section.<sup>27</sup>



Yip SK et al (1997) showed that surgical techniques followed in association with closed rectus sheath drainage in itself can demonstrate significant outcome than any antibiotic trial.<sup>28</sup>

Kolben M et al (2001) showed that the incidence of post caesarean infectious morbidity in low-risk elective caesarean section cannot be lowered by intra operative antibiotic prophylaxis.<sup>29</sup>

Bagratee et al (2001) showed that cefoxitin given prophylactically in elective caesarean section did not decrease post-operative infectious morbidity.<sup>30</sup>

Bracero LA 1997 compared single intravenous dose of combination of ampicillin / sulbactam was equally effective and safe as a single dose intravenous Cefotetan administered in patients at high risk of developing postoperative morbidity.<sup>32</sup>

In 1973, Ledger sweet, Heedington were the first to demonstrate the effectiveness of short term prophylactic antibiotic therapy. The human skin is constantly and continuously exposed to organisms present in the environment, cultures from the skin showed presence of diptheroides, staphylococcus (Aerobic and anaerobic), strep.viridians, gram +ve aerobic spore forming bacilli, , strep. Faecalis, gram negative bacilli, E.Coli, proteus, candida albicans, mycococci, pityrosporum ovale.<sup>33</sup>

# **OVERVIEW**

## **POST CAESAREAN COMPLICATIONS**

The various infectious complications following caesarean section are post-partum fever , urinary tract infection, wound infection, endomyometritis, bacteremia, other serious infections (pelvic abscess, septic shock, necrotizing fasciitis and pelvic vein thrombophlebitis).

### **Post Partum Fever:**

It is a temperature of 38<sup>0</sup> C or higher in the puerperium. About 20% of women delivered vaginally and 70% of women delivered by caesarean section develop fever within the first 24 hrs. Genital infection causes most persistent infection after childbirth. High spiking fevers of 39<sup>0</sup> C or more developing within 24 hrs should be evaluated for serious pelvic infections by Streptococcus. Other common causes of fever are breast engorgement, pyelonephritis or respiratory infection.

### **Uterine Infection:**

Post partum uterine infection is also called as endometritis , endomyometritis, endoparametritis because infection involves not only the decidua but also the myometrium and parametrium.

Risk factors for post- partum uterine infection:

There are several risk factors for uterine infection. Single most important risk factor for infection is the route of delivery. There is 25% increased infection

related mortality rate, rehospitalization for wound sepsis and endometritis following caesarean section.

The other important risk factors are

- 1) prolonged labor,
- 2) membrane rupture,
- 3) multiple cervical examination during labor,
- 4) internal fetal monitoring,
- 5) anemia, malnutrition, obesity,
- 6) lower socio economic status,
- 7) Bacterial colonization of lower genital tract with various microorganisms,
- 8) Caesarean delivery for multifetal gestation,
- 9) Young maternal age and nulliparity,
- 10) Prolonged labor induction,
- 11) Meconium Stained Amniotic Fluid

Bacteriology:

Genital infections are generally polymicrobial.

Aerobes – Gram positive cocci: Staphylococcus aureus, staphylococcus epidermidis, Group A, B and D Streptococcus enterococcus.

Gram negative bacteria: E.Coli, Klebsiella, Proteus.

Gram variable: Gardnerella vaginalis.

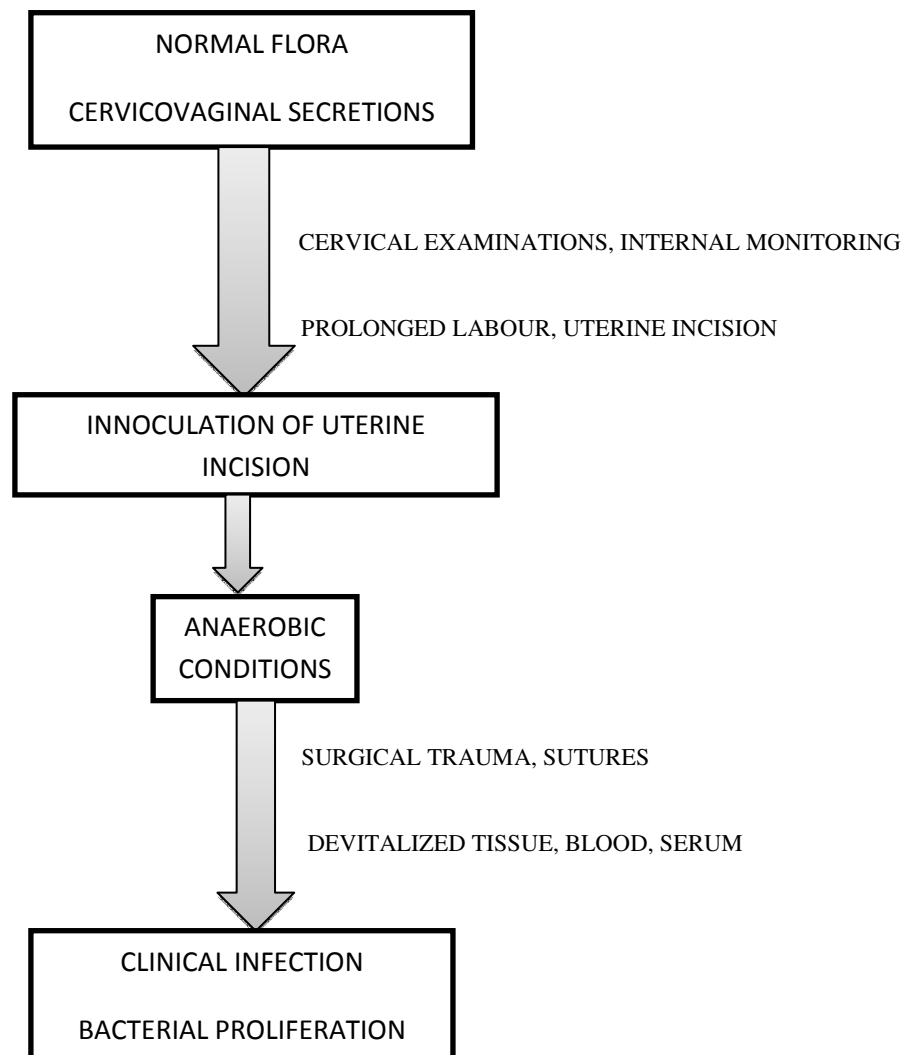
Others: Mycoplasma, Chlamydia, N.gonorrhoea

Anaerobes: cocci – peptostreptococcus and peptococcus.

Others – clostridium, Fusobacterium species, Mobiluncus species.

Pathogenesis of metritis following caesarean section:

The uterine cavity is usually sterile even though the cervix and vagina are routinely colonized with bacteria. During labor and delivery, due to associated manipulations, the amniotic fluid and uterine cavity gets contaminated with aerobic and anaerobic bacteria.



Gilstrap and Cunningham in 1979 cultured amniotic fluid of women in labor and rupture membranes for more than 6 hrs and delivered via caesarean section.

Among the various organisms cultured, aerobic and anaerobic organisms constituted 63%, anaerobes alone 30% and aerobes alone 7%.

#### Clinical Course:

Most important criteria for diagnosis of post-partum endometritis is fever.

Temperature commonly ranges between 38-39<sup>0</sup> C , women complains of abdominal pain, chills, foul smelling vaginal discharge. Parametrial tenderness can be elicited on bimanual and abdominal examination. Leucocytosis ranges from 15,000 to 30,000 cells/microliters.

#### Treatment:

Women suffering from mild metritis can be treated on outpatient basis with oral antibiotics. Those with moderate to severe disease requires hospitalization and parenteral antibiotics. Symptoms subside within 48-72 hrs in 90% patients.

Persistent fever after this interval requires careful search for refractory pelvic infection such as pelvic abscess, hematoma, pelvic cellulitis, thrombophlebitis and a parametrial phlegmon.

### Choice of Antimicrobials:

#### Antimicrobial Regimens for Pelvic Infection Following Caesarean Delivery

Regimen	Comments
Clindamycin 900mg + gentamycin 1.5 mg/kg,q8h intravenously	“Gold Standard”, 90-97% efficacy,once daily gentamycin dosing acceptable + Ampicillin added to regimen with sepsis syndrome or suspected enterococcal infection.
Clindamycin +aztreonam	Gentamycin substitute with renal insufficiency
Extended Spectrum Penicillins	Piperacillin, ampicillin/sulbactam
Extended Spectrum Cephalosporins	Cefotetan, Cefotaxime, Cefoxitin
Imipenem + cilastatin	Reserved for special indications

### Urinary Tract Infection:

The most common problem following caesarean section is UTI. It is frequently acquired due to bladder catheterization that introduces the urethral organisms inside. Patient presents with fever with or without chills, burning micturition, increased frequency of micturition and lower abdominal pain. 60% of UTI is

caused by gram negative bacilli like E.coli, Klebsiella, enterobacter, proteus, pseudomonas. Only 10% of infection is caused by gram positive organisms commonly enterococcus. Infection due to anaerobic organism is rare. Occasionally infection is due to serratia and other bacteria. Diagnosis is by urine culture and sensitivity. Treatment is based on the culture sensitivity report. Routinely used antibiotics are Amoxicillin, coamoxyclav, ciprofloxacin.

## **COMPLICATIONS OF PELVIC INFECTION**

### **Wound Sepsis:**

Wound infection complicates 20 -27% of caesarean section. Incidence of infection varies with primary and repeat caesarean section 7% and 30% respectively. Risk factors for wound infection include diabetes, corticosteroid therapy, immunosuppression, anemia, hypertension and inadequate hemostasis with hematoma formation. Treatment includes broad spectrum antibiotics, drainage of pus from wound by removing sutures followed by secondary en bloc suturing at 4 to 6 days.

### **Necrotizing Fasciitis:**

This is an uncommon, severe wound infection associated with high mortality. It may involve abdominal wound, episiotomy wounds or complete perineal tears and there is significant tissue necrosis. The three most important risk factors for fasciitis are diabetes, hypertension and obesity that are relatively more common in



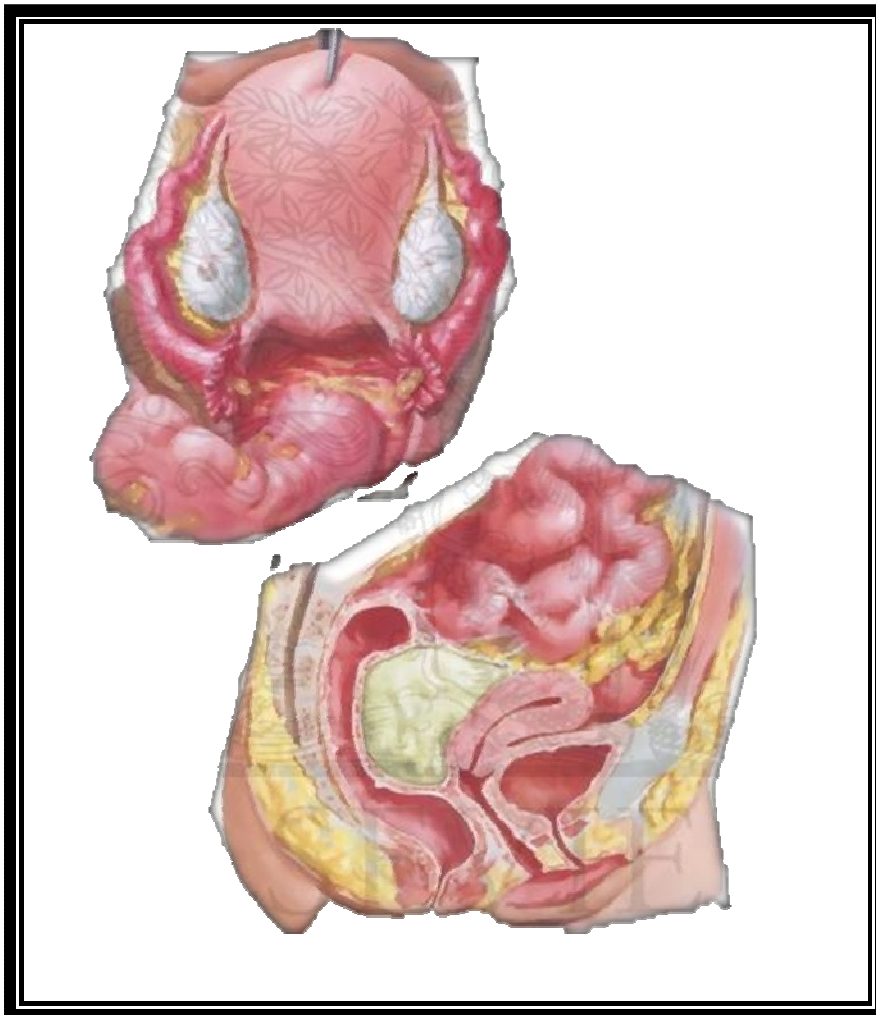
pregnancy. Infection is polymicrobial caused by the normal vaginal flora. Sometimes infection is caused by single virulent bacterial species like streptococcus. Treatment includes broad spectrum antibiotics and wide fascial debridement until fresh bleeding occurs. In case of wide excision, synthetic mesh may be required to close the fascia.

### **Peritonitis**

It is unusual following caesarean section but invariably preceded by metritis and uterine incision site necrosis and dehiscence. Other causes are inadvertent bowel injury, rupture of pelvic or parametrial abscess. Abdominal rigidity may not be prominent in post-partum period because of lax abdominal wall. Patient may have severe pain but most frequently, the first symptom seems to be adynamic ileus. In cases where the infection develops with intact uterus, antimicrobial treatment alone is sufficient. Surgical treatment is required in cases of peritonitis following uterine wound necrosis or dehiscence or rupture of pelvic abscess.

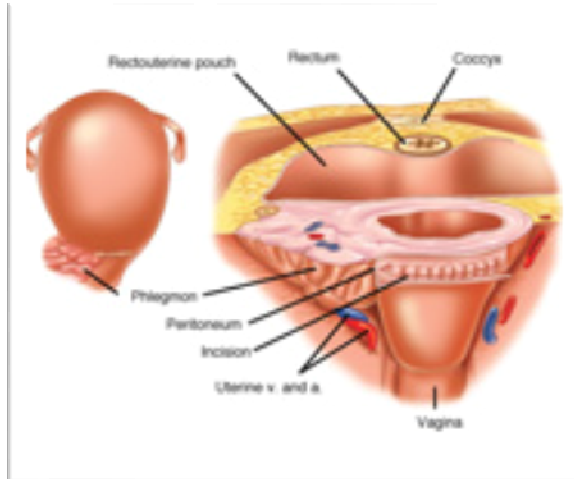
### **Adnexal Infections:**

Ovarian abscess rarely occurs in puerperium due to bacterial invasion through a rent in ovarian capsule. The woman usually presents 1 to 2 wks following delivery. Abscess is usually unilateral and rupture is common leading to peritonitis.

**Picture of Pelvic Abscess With Peritonitis:****Parametrial Phlegmon:**

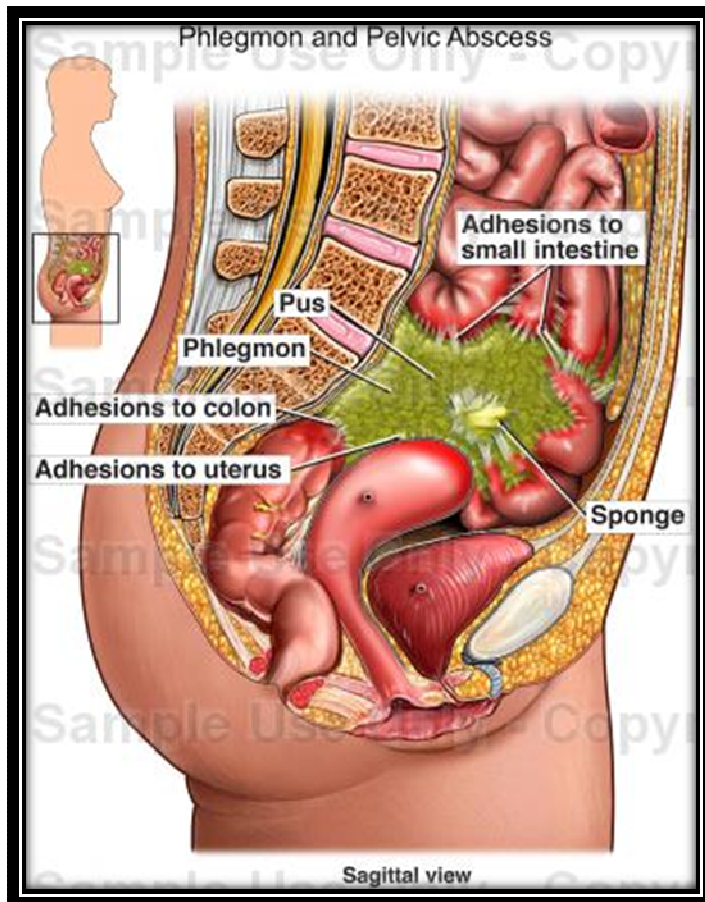
It is an intensive form of parametrial cellulitis that forms an area of induration or phlegmon within the leaves of broad ligament. Diagnosis is to be suspected when the fever persists for more than 72 hrs despite parenteral antibiotics. These are

usually unilateral and limited to parametrial area at the base of the broad ligament. When there is intense inflammatory reaction, the cellulitis spreads along the lines of cleavage, most common form being lateral extension along broad ligament with a tendency to extend to the pelvic sidewall. Occasionally, posterior extension occurs involving rectovaginal septum, forming a firm mass posterior to the cervix. Severe cellulitis of the uterine incision results in necrosis and separation along the lines of cleavage. Extrusion of purulent material leads to peritonitis. Because puerperal metritis with cellulitis is typically a retroperitoneal infection, evidence of peritonitis suggests the possibility of uterine incisional necrosis, or less commonly, a bowel injury or other lesion.



**Picture of a parametrial phlegmon. Cellulitis causes induration in the right parametrium adjacent to uterine caesarean incision. Induration extends to pelvic side wall. On bimanual palpation, a phlegmon is palpable as a firm mass..**

## Picture of Parametrial Phlegmon with Pelvic Abscess:



### Treatment:

In most women with a phlegmon, clinical improvement follows continued treatment with broad spectrum antibiotics. Fever subsides in 5 to 7 days.

Absorption of induration may require several days to weeks.

Surgery is reserved for women in whom uterine incisional site necrosis is suspected.

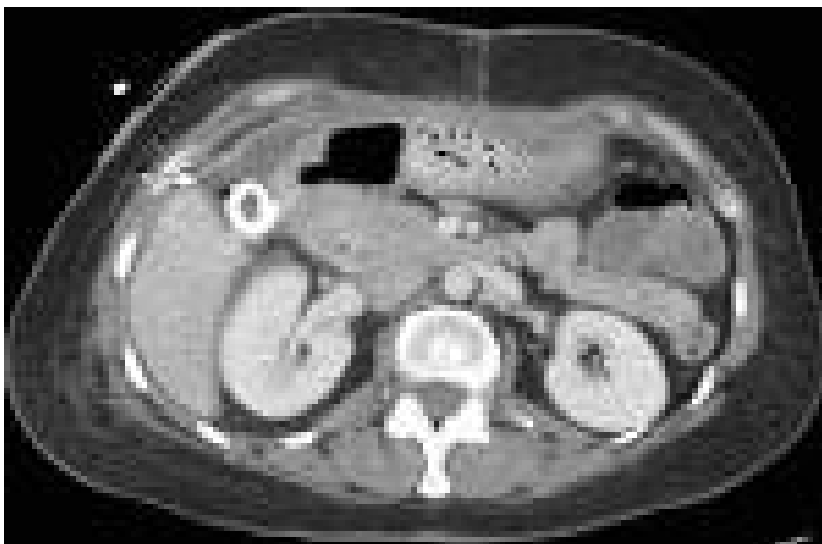
In rare cases, uterine debridement and resuturing of incision are feasible.

For most cases, hysterectomy and surgical debridement are needed but practically difficult. There is often appreciable blood loss. Frequently, the cervix and lower uterine segment are involved with an intense inflammatory process that extends to the pelvic sidewall to encompass one or both ureters. The adnexa are seldom involved, and one or both ovaries can usually be preserved.

### **Pelvic Abscess**

Rarely a parametrial phlegmon suppurates leading to formation of broad ligament abscess. These abscesses usually dissect anteriorly. Occasionally it dissects posteriorly that may require colpotomy. Formation of psoas abscess is rare and it requires percutaneous drainage.

### **CT Picture Of Pelvic abscess**



**Imaging Studies:**

Persistent puerperal infection has to be evaluated with Computed tomography (CT) or Magnetic Resonance Imaging (MRI). Uterine incisional dehiscence is sometimes suspected using CT images. These must be interpreted with clinical context because apparent uterine incisional defects thought to represent edema can be seen on images after uncomplicated caesarean delivery.

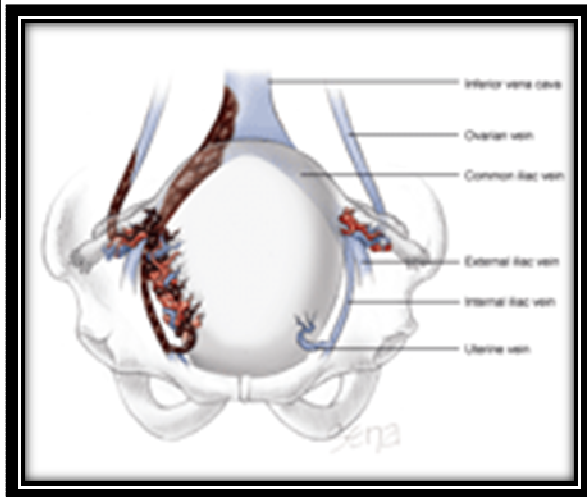
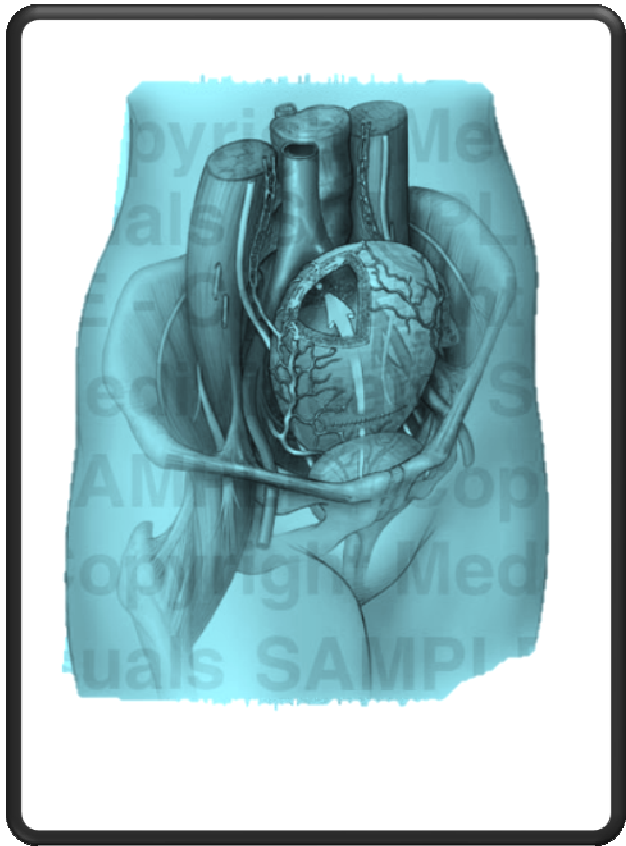
**Pelvic Septic Thrombophlebitis:**

This was a common complication in preantibiotic era. Septic embolization was common and this was the cause of 1/3<sup>rd</sup> of deaths during that period. The mortality rate and need for surgical treatment for these conditions decreased with use of antibiotics.

**Pathogenesis:**

Puerperal infection extends along the venous routes causing thrombosis. The ovarian veins then get involved because they drain the upper uterus and therefore, the placental implantation site. In ¼ th of women, the clot extends into the inferior vena cava and occasionally the renal vein.

## Pathway of Septic Thrombophlebitis in postpartum uterus



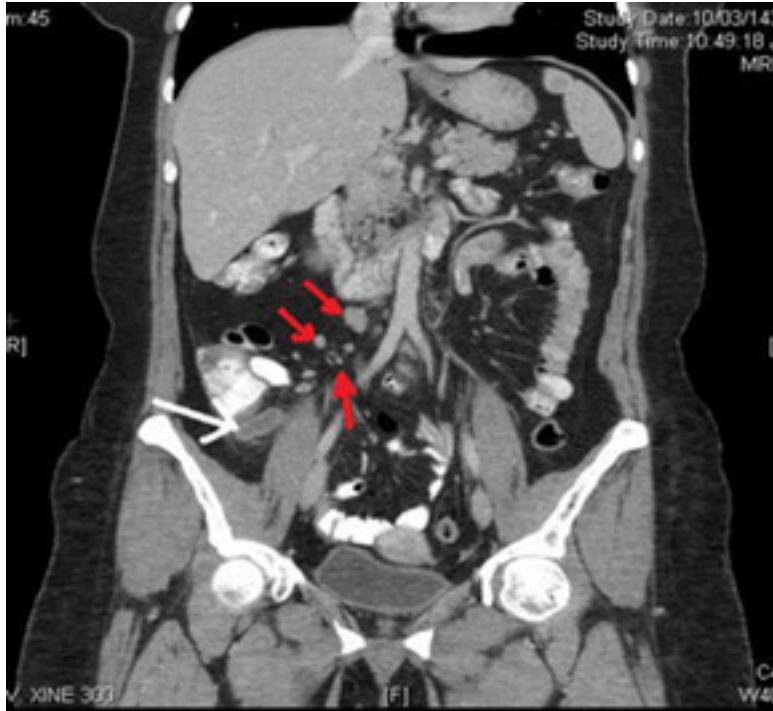
Incidence:

Following vaginal delivery – 1 in 9000

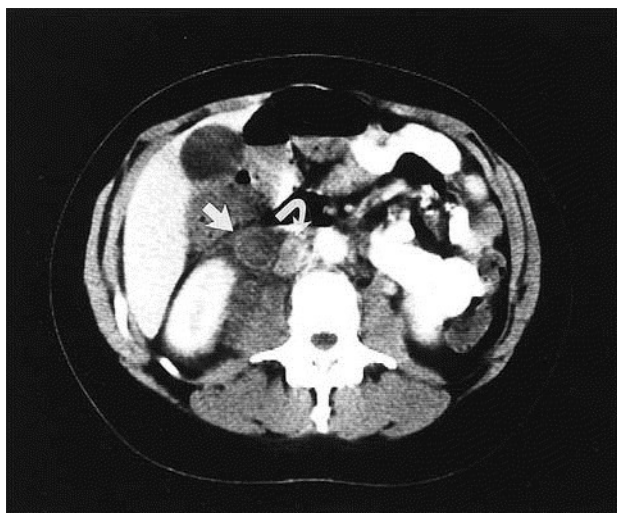
Following Caesarean delivery – 1 in 800

Management: Diagnosis can be confirmed by CT scan or MRI imaging. Before imaging methods were available, heparin challenge test was advocated.

**CT picture of IVC thrombosis:**



**CT picture of Rt.Ovarian vein Thrombosis:**





Patients with septic pelvic thrombophlebitis usually respond to antimicrobials.

There is no evidence for long term anticoagulants use as in venous thromboembolism.

## **METHODS OF PREVENTING INFECTION**

Methods of preventing infection starts in the antenatal period itself. According to CDC guidelines for prevention of surgical site infection, there are multiple pre-operative considerations that have been studied in an attempt to reduce the incidence of post-operative infection.

### **Antepartum prevention:**

- 1) Identifying at risk cases during the antenatal checkups and correcting the modifiable factors,
- 2) To identify women with anemia and to build up hemoglobin level,
- 3) To improve the nutritional status of malnourished women,
- 4) Achieving blood sugar control in diabetic patients and blood pressure control in hypertensive patients,
- 5) Treatment of preexisting infections if any,
- 6) To avoid repeated per vaginal examinations when patient is in labor,
- 7) Labor not to last for more than 12 hrs following rupture of membranes,

### **8) Pre-operative care:**

Pre-operative antiseptic showering on the day of surgery or the previous day is said to lower the colony counts. Studies shows 9 fold decrease in colony

count with chlorhexidine compared to 1.3 fold with povidone - iodine shower.

A Cochrane review published in 2011 that included 3 trials, showed increased risk of SSIs when hair was shaved as opposed to clipping. Increased risk with shaving is due to microscopic abrasions that serve as foci for bacterial growth. Hence hair removal prior to surgery is deemed necessary and use of clippers is preferred over shaving.

Pre-operative preparation of incision site with povidone- iodine, alcohol containing products, chlorhexidine gluconate.

#### **9) Pre –operative Antibiotics**

ACOG recommends single dose of narrow spectrum antibiotics ampicillin or first generation cephalosporin (Cefazolin) 2gm intravenous or clindamycin 900mg intravenous if there is penicillin allergy to be given 60 mins prior to incision. Extended spectrum antibiotic prophylaxis with an agent such as azithromycin may be beneficial in patients at higher risk of infection such as obese, diabetic.

#### **10) Intra operative considerations**

Use of isolation towels.

Sound surgical techniques.

Manual removal of placenta is associated with increased risk of infection compared to delivery of placenta by fundal massage and cord traction.

Meticulous hemostasis because blood clots act as a nidus for growth of organisms.

Following strict surgical standards to minimize tissue trauma and crushing of tissues.

Use of skin staples for closure is associated with increased risk of infection compared to sub cuticular suturing. But post-operative pain, cosmetic outcome and patient satisfaction are same with both.

### **11)Post-operative considerations**

Strict glycemic control in diabetic women in the immediate post-operative period.

Early removal of bladder catheter.

Occlusive skin dressing. CDC 2005 recommends sterile dressing for 24 to 48 hrs post-operative.

Studies shows that there is no statistically significant difference in rates of infection with closure of pelvic peritoneum, single versus double layer uterine closure, exteriorization of uterus for repair, pre-operative vaginal cleansing with povidone- iodine, administration of high concentration of peri operative oxygen and saline wound irrigation.

## CEPHALOSPORINS

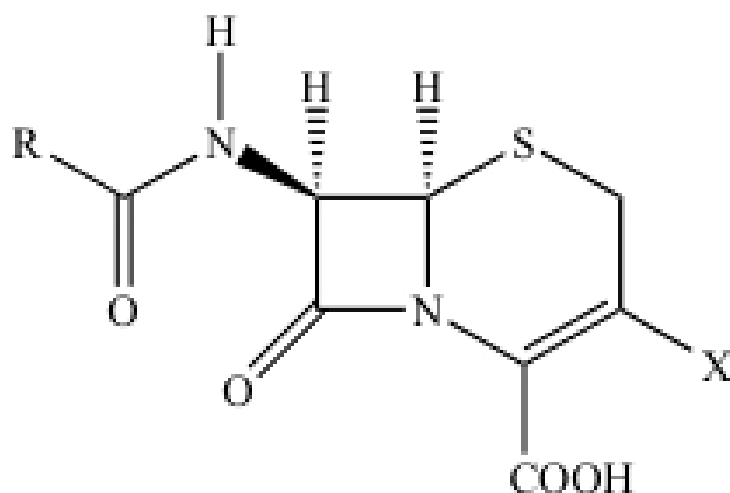
### History and Source

Cephalosporins are most frequently prescribed class of antibiotics, belonging to a class of  $\beta$ -lactam antibiotics that are structurally and pharmacologically similar to penicillins. Cephalosporins were originally derived from fungus *Acremonium* previously known as “Cephalosporium”. Isolation was done by an Italian scientist Giuseppe Brotzu from a sewer in Sardinia in 1964. He noticed that these cultures were effective against *Salmonella typhi* that had  $\beta$ -lactamase. Guy Newton and Edward Abraham at the Sir William Dunn School of Pathology at the University of Oxford isolated Cephalosporin C. The cephalosporin nucleus, 7-aminocephalosporinic acid (7-ACA) was derived from Cephalosporin C. This was analogous to penicillin nucleus 6-aminopenicillanic acid, but not potent for clinical use. Modification of the 7-ACA side chains resulted in development of useful antibiotic agents. First agent Cephalothin was launched by Eli Lilly in 1964. Together with cephamycins, they constitute a sub group of  $\beta$  lactam antibiotics called cepheems.

## Chemistry

Cephalosporin C has a side chain that is derived from d-α-aminoadipic acid which is condensed with a dihydrothiazine β-lactam ring system (7-aminocephalosporanic acid).

β- lactam ring at the core of cephalosporins



Agents containing 7-aminocephalosporanic acid are relatively stable in dilute acid. They are highly resistant to enzyme penicillinase. Cephalosporin C can be hydrolyzed to 7- aminocephalosporanic acid. This has been modified by the addition of different side chains to create whole family of cephalosporins. It appears that modifications at position 7 of the β-lactam ring is associated with an alteration in antimicrobial activity. The substitutions at position 3 of the

dihydrothiazine ring is associated with change in metabolism and pharmacokinetic properties of the drugs (Huber et al 1972). The cephamycins are similar to cephalosporins, but have a methoxy group at position 7 of the  $\beta$ -lactam ring of 7-aminocephalosporanic acid nucleus.

### **Mechanism of action**

These are bactericidal agents with mechanism of action similar to that of penicillins. They disrupt synthesis of peptidoglycan layer of the cell walls which causes the cell wall to break eventually causing death of the bacteria.

### **CLASSIFICATION OF CEPHALOSPORINS**

Cephalosporins are conventionally divided into 4 generations. This classification has a chronological sequence of development, but more importantly, takes into consideration the overall antibacterial spectrum as well as potency. First generation cephalosporins have high activity against gram positive bacteria but weaker activity against gram negative bacteria.

Second generation cephalosporins were more active against gram negative organisms with some members active against anaerobes. None of them were found to inhibit *Pseudomonas aeruginosa*.

Third generation Cephalosporins had augmented activity against gram negative Enterobacteriaceae, some inhibit *Pseudomonas* as well. All are highly active

against  $\beta$ - lactamases from gram negative bacilli. However they are less active on gram positive cocci and anaerobes.

Generations	Examples		Spectrum of activity
	Parenteral	Oral	
First	Cephalothin Cefazolin	Cephalexin Cephadrine Cefadroxil	Streptococci; Staphylococcus aureus. No activity against Enterococci or Listeria.
Second	Cefuroxime Cefoxitin	Cefaclor Cefuroxime axetil	Escherichia coli, Klebsiella, proteus, Haemophilus influenzae, Moraxella catarrhalis, Not as active against gram positive organisms as first generation agents. Similar spectrum to cefuroxime but with added activity against Bacteroides fragilis.
Generations	Example		Spectrum of activity



Third	Cefotaxime Ceftizoxime Ceftriaxone Ceftazidime Cefaperazone	Cefixime Cefpodoxime proxetil, Cefdinir, Ceftibuten Ceftamet pivoxil	Enterobacteriaceae ; Pseudomonas aeruginosa ; Serratia; Neisseria gonorrhoea; activity for staphylococcus aureus and streptococcus pyogenes, comparable to first generation agents.
Fourth	Cefepime Cefpirome		Comparable to third generation but more resistant to some $\beta$ lactamases

Individual cephalosporins differ in their:

- (a) Antibacterial spectrum and relative potency against specific organisms.
- (b) Susceptibility to  $\beta$  lactamases elaborated by different organisms.
- (c) Pharmacokinetic properties.
- (d) Local irritancy on i.m injection. Few cannot be given as i.m injection.

## **Mechanisms of Bacterial Resistance to the Cephalosporins.**

Resistance to cephalosporins may be due to inability of the antibiotic to reach its target site, or due to alterations in the penicillin-binding proteins (PBPs) that are targets of cephalosporins, so that the antibiotics bind with lower affinity, or susceptibility to bacterial enzymes ( $\beta$ -lactamases) that can hydrolyze the  $\beta$ -lactam ring and inactivate the cephalosporin.

Alteration in two PBPs are sufficient to render pneumococcus resistant to third generation cephalosporins, as the other three high molecular weight PBPs have inherently low affinity (Spratt, 1994).

The most prevalent mechanism of resistance to cephalosporins is the destruction of the cephalosporins by hydrolysis of the  $\beta$ -lactam ring. Gram positive microorganisms produce relatively large amounts of  $\beta$ -lactamases compared to gram negative bacteria, but the enzyme located in the periplasmic space is more effective in destroying cephalosporins as they diffuse to reach their target sites on the inner membrane. The cephalosporins have variable susceptibility to  $\beta$ -lactamases. The third generation cephalosporins are more resistant to hydrolysis by the  $\beta$ -lactamases. Treatment of infections due to aerobic gram negative bacilli with second or third generation cephalosporins and / or imipenem result in induction of type 1 lactamases and resistance to third generation cephalosporins.

## **Adverse Effects of Cephalosporins**

They are generally well tolerated but more toxic than penicillin.

- 1) Pain following i.m injection. This is so severe with Cephalothin.  
Thrombophlebitis of injected vein can occur.
- 2) Diarrhea: This is due to alteration in gut flora or due to irritation with oral Cephadrine or parenteral Cefaperazone.
- 3) Hypersensitivity reactions similar to penicillins but lower in incidence.  
Rashes are the most frequent manifestations. Others are angioedema, anaphylaxis, asthma, urticaria. 10% patients with penicillin allergy show cross reactivity to cephalosporins.
- 4) Nephrotoxicity - highest with cephalodrine. Cephalothin has low grade nephrotoxic potential that can be aggravated by preexisting renal disease, concurrent administration of an aminoglycoside or a loop diuretic.
- 5) Bleeding occurs with certain cephalosporins due to hypoprothrombinemia caused by same mechanism as warfarin.
- 6) Neutropenia and thrombocytopenia with Ceftazidime and others.
- 7) Disulfiram like reaction with Cefaperazone.

## **Therapeutic uses of cephalosporins in general:**

The cephalosporins are widely used therapeutically important antimicrobials.

Clinical studies have shown that cephalosporins are effective as both

therapeutic and prophylactic agents (Donowitz and Mandell, 1988).

- 1) Cephalosporins with or without aminoglycosides, have been considered as the drug of choice for serious infections caused by *Klebsiella*, *Proteus*, *Serratia*, *Enterobacter*, *Providencia* and *Haemophilus* species.
- 2) The third-generation cephalosporins ( Cefotaxime and ceftriaxone) are currently the drugs of choice for the initial treatment of meningitis in immunocompromised children, adults and older than 3 months because of their antimicrobial activity and good penetration into CSF.They are effective for the treatment of meningitis that is caused by *H.influenzae*, sensitive *Strep. Pneumoniae*, *N. Meningitidis*, and gram-negative enteric bacteria. They are useful in a variety of infections in patients who cannot tolerate penicillins. These infections include streptococcal and staphylococcal infections.
- 3) Infections with anaerobes are often treated with a combination of antibiotics, since aerobic microorganisms are also usually present.
- 4) The spectrum of activity of Cefotaxime, ceftriaxone, cefuroxime and Ceftizoxime appears to be excellent for the treatment of community acquired pneumonias. i.e., those caused by pneumococci, *H.influenzae* or staphylococci. Nosocomial infections are frequently caused by microorganisms resistant to many of the commonly used drugs such as the

ampicillins, cephalosporins, aminoglycosides and some of the antipseudomonal penicillins .

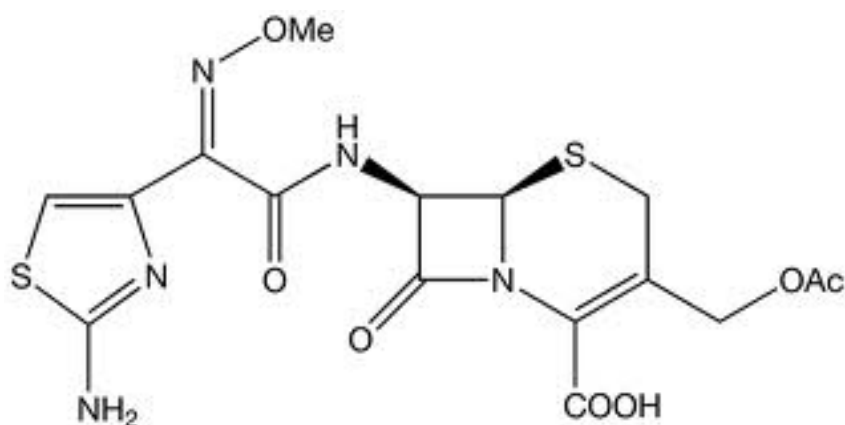
- 5) Third generation cephalosporins and imipenem have additional therapeutic uses, but the emergence of resistance has limited their usefulness.
- 6) Patients who are severely neutropenic can be successfully treated with a third generation cephalosporin with or without an aminoglycoside.

### Third Generation Cephalosporins

Introduced in 1980, they have augmented activity against gram negative enterobacteriaceae; some inhibit pseudomonas as well. All are resistant to  $\beta$ -lactamases from gram negative bacteria. However they are less active against gram- cocci and anaerobes.

### Cefotaxime

Structure of cefotaxime:



It is the prototype of third generation cephalosporins and exerts potent action on aerobic gram negative as well as some gram positive bacteria, but is not active on anaerobes (particularly *Bact.fragilis*), *Staph.aureus* and *Ps.aeruginosa*.

Indications – meningitis caused by gram negative bacilli, life threatening resistant/hospital acquired infections, septicemias and infections in immunocompromised patients. It is also used as a single dose therapy for PPNG urethritis.

Cefotaxime is deacetylated in the body; the metabolite exerts weaker but synergistic action with the parent drug. Plasma  $t_{1/2}$  is 1 hr, but is longer for deacetylated drug – permitting 12 hourly doses in many situations.

# **MATERIALS AND METHODS**

## **MATERIALS AND METHODS**

### **Aims and objectives:**

To compare the effectiveness of Prophylactic Antibiotics over regular post-operative antibiotic usage in preventing post-operative morbidity in terms of fever, urinary tract infection, vaginal infection, wound sepsis in patients undergoing both elective and emergency clean caesarean section.

### **Study Place:**

The study was conducted at the Institute of Social Obstetrics, Government Kasturba Gandhi Hospital, Attached to Madras Medical College, Chennai.

### **Study Design:**

This was an interventional study / Prospective Study.

### **Study Period:**

The study was conducted for a period of 1 year starting from January 2012 to December 2012.

### **Participants:**

The study group consisted of 1000 patients selected after considering the exclusion criteria and inclusion criteria.



### Inclusion criteria

- 1) Women booked and immunized at KGH,
- 2) Women who had regular ante natal visits,
- 3) Women undergoing elective and emergency clean caesarean section (not in labor for >6 hrs),
- 4) Antenatal period uneventful,
- 5) Low risk antenatal mothers without any preexisting medical illness.

### Exclusion criteria

- 1) Referral cases,
- 2) Premature Rupture of Membranes > 12 hrs,
- 3) Meconium stained liquor,
- 4) Associated medical complications,
- 5) Pre-existing infection,
- 6) Anemia,
- 7) Intra operative blood loss > 2 liters,
- 8) Operative period lasting >3 to 4 hrs,
- 9) First visit to KGH without any previous records.

The above 1000 patients were divided randomly into two groups of five hundred patients. Group -1 patients received Injection Cefotaxime 2 gms single dose

intravenous stat at the time of cord clamping during caesarean section. These patients were not prescribed any post-operative antibiotics.

Group- 2 patients received no prophylactic antibiotics. They were given post-operative antibiotics Inj.Cefotaxime 1gm intravenous twice daily for 5 days.

### **Method of study:**

After a careful history taking and detailed examination to rule out any preexisting illness, infection or risk factors for infection, patients were selected for the study. They were divided randomly into two groups.

The women were informed regarding the study and consent obtained. On the day of surgery, the patient was given test dose of Inj. Cefotaxime and shifted to theatre after checking for any allergic reactions.

The theatre anesthetist on duty was informed regarding the procedure and group 1 patients were given Inj.Cefotaxime 2 gms iv at the time of cord clamping.

Throughout the procedure the patient was observed for any intra operative complications such as excess blood loss or conditions that may prolong the operative time so as to decide on additional antibiotic to be given. At the end of surgery, it was made sure that no post-operative antibiotics were prescribed and patient was shifted to immediate post-operative ward.

In contrast group -2 patients were not given any pre or intraoperative antibiotic. These patients received Inj. Cefotaxime 1 gm intravenous 4-6 hrs following caesarean section and it was given twice daily for 5 days.

Both groups of patients were informed regarding the signs and symptoms of wound infection, urinary infection, vaginal and uterine infections.

Signs of infection are redness and swelling in the wound, throbbing pain in the wound area, pus or foul smelling discharge from the wound, generalized fever with chills and rigors, erythema, induration, cellulitis, uterine tenderness and foul smelling lochia.

The patients were observed for any post-operative complications such as temperature more than 38<sup>0</sup> C recorded on two separate occasions 4 hrs apart, symptoms of dysuria, increased frequency of micturition and signs of wound infection if any are noted.

Blood culture and sensitivity were done routinely for all patients on 2<sup>nd</sup> and 5<sup>th</sup> day and results were meticulously compared and interpreted.

Patients followed up until day of discharge for any signs or symptoms of infection and if any additional antibiotics were used . The study findings were recorded.

Results interpreted and compared and conclusion arrived at.

# **RESULTS AND ANALYSIS**

## RESULTS

Total No. of Cases taken for Group – I: 500

Total No. of Cases taken for Group – II: 500

### AGE DISTRIBUTION IN LSCS GROUP

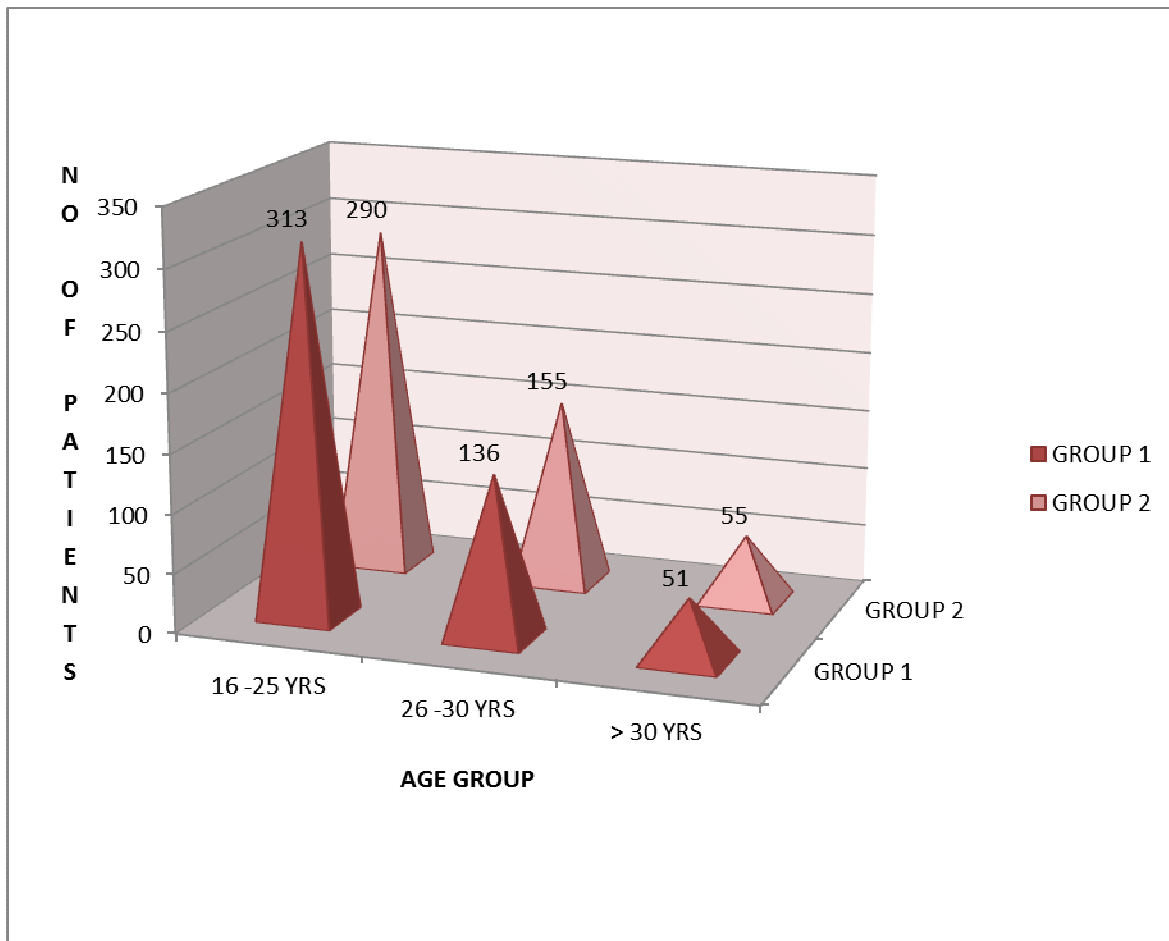
**TABLE – I**

AGE GROUP	GROUP 1		GROUP 2	
	NO	%	NO	%
<b>16-25 YRS</b>	<b>313</b>	<b>62.6</b>	<b>290</b>	<b>58</b>
<b>26-30 YRS</b>	<b>136</b>	<b>27.2</b>	<b>155</b>	<b>31</b>
<b>&gt;30 YRS</b>	<b>51</b>	<b>10.2</b>	<b>55</b>	<b>11</b>

Table – 1: Shows the Age Distribution in both LSCS Group – I & II.

In both the groups, more than 50% of patients belong to the age group 16 – 25 years.

### AGE DISTRIBUTION IN LSCS GROUP



This bar diagram depicts age distribution in the two groups of patients.

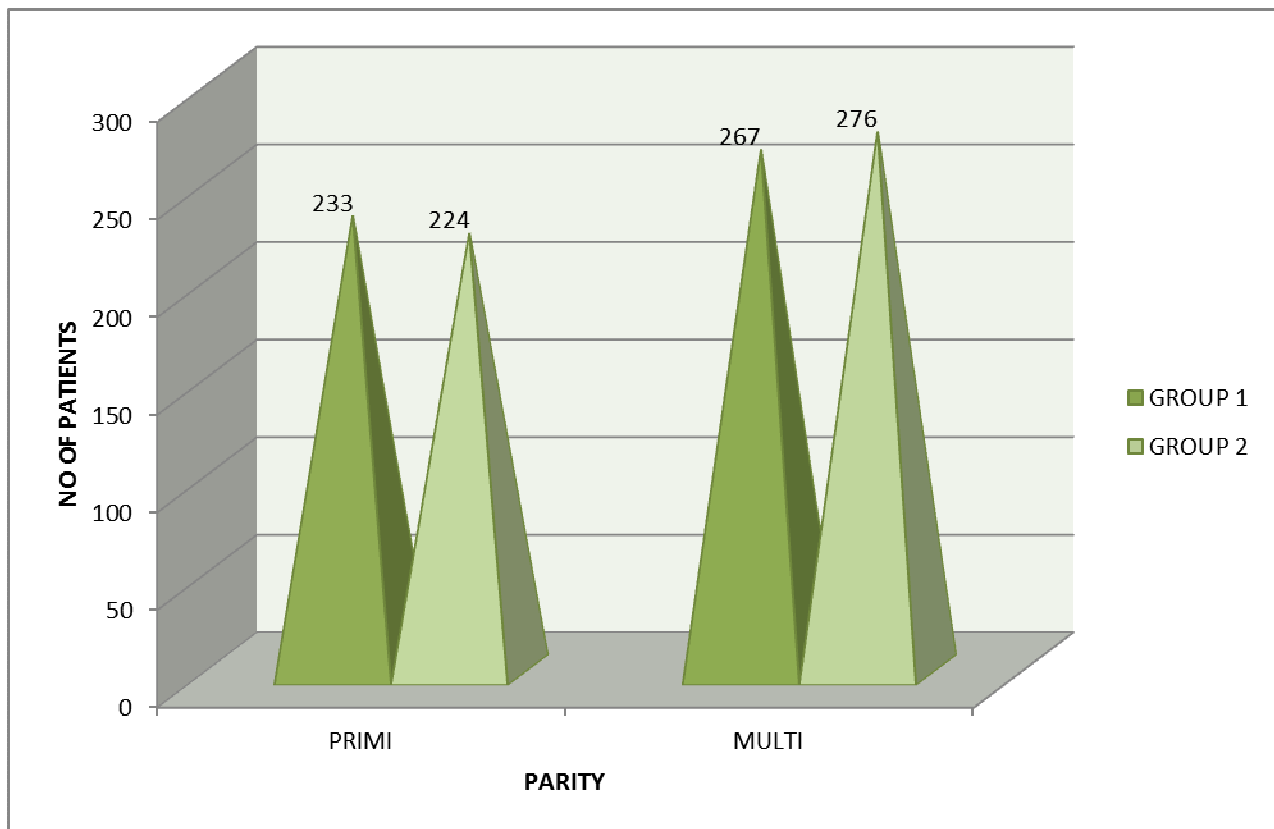
**PARITY GROUP****TABLE – 2**

	<b>GROUP 1</b>		<b>GROUP 2</b>	
	<b>NO</b>	<b>%</b>	<b>NO</b>	<b>%</b>
<b>PRIMI</b>	<b>233</b>	<b>46.6</b>	<b>224</b>	<b>44.8</b>
<b>MULTI</b>	<b>267</b>	<b>53.4</b>	<b>276</b>	<b>55.2</b>

Table – 2: shows the No. of Primi and Multi in both Group – I & II.

The above table shows that about 44 to 47 % of patients undergoing caesarean section were primipara and 53 to 54 % multipara.

## PARITY GROUP



**Bar diagram showing distribution of Primipara and Multipara in both the groups.**

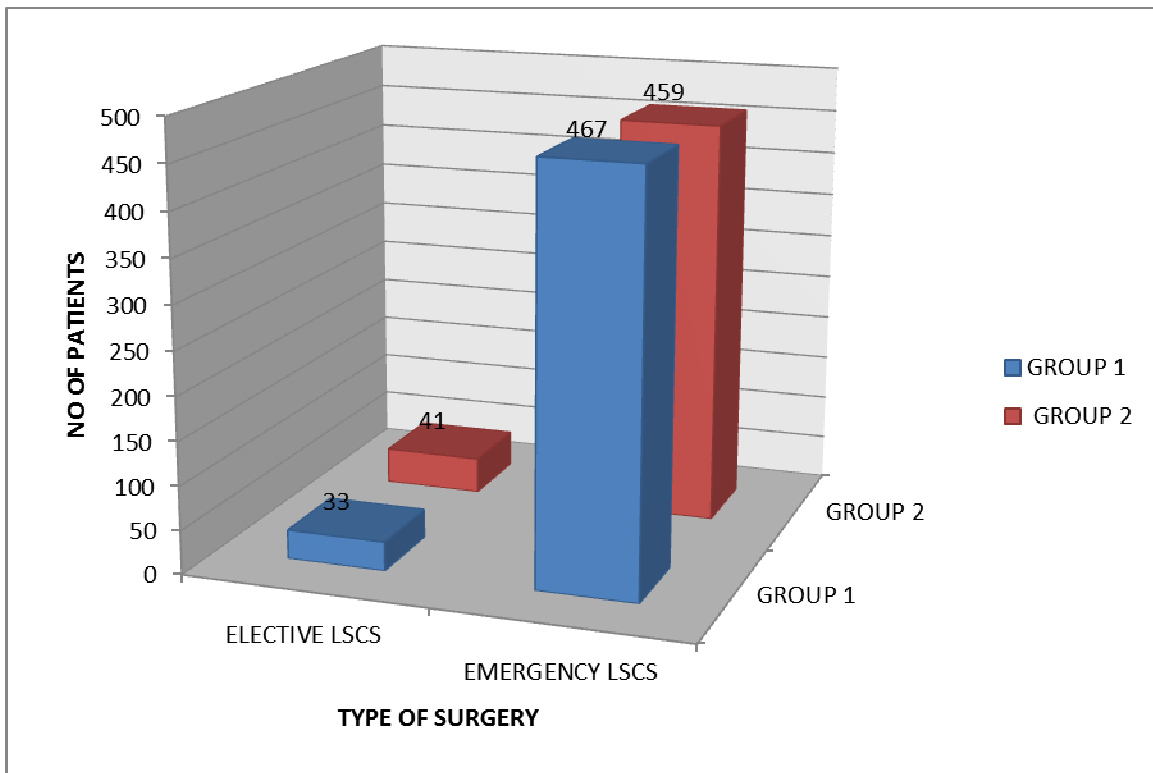


**TYPE OF SURGERY****TABLE – 3**

	<b>GROUP 1</b>		<b>GROUP 2</b>	
	<b>NO</b>	<b>%</b>	<b>NO</b>	<b>%</b>
<b>ELECTIVE LSCS</b>	<b>33</b>	<b>6.6</b>	<b>41</b>	<b>8.2</b>
<b>EMERGENCY LSCS</b>	<b>467</b>	<b>93.4</b>	<b>459</b>	<b>91.8</b>

Table – 3: shows the Type of Surgery in both Group – I & II.

### TYPE OF SURGERY



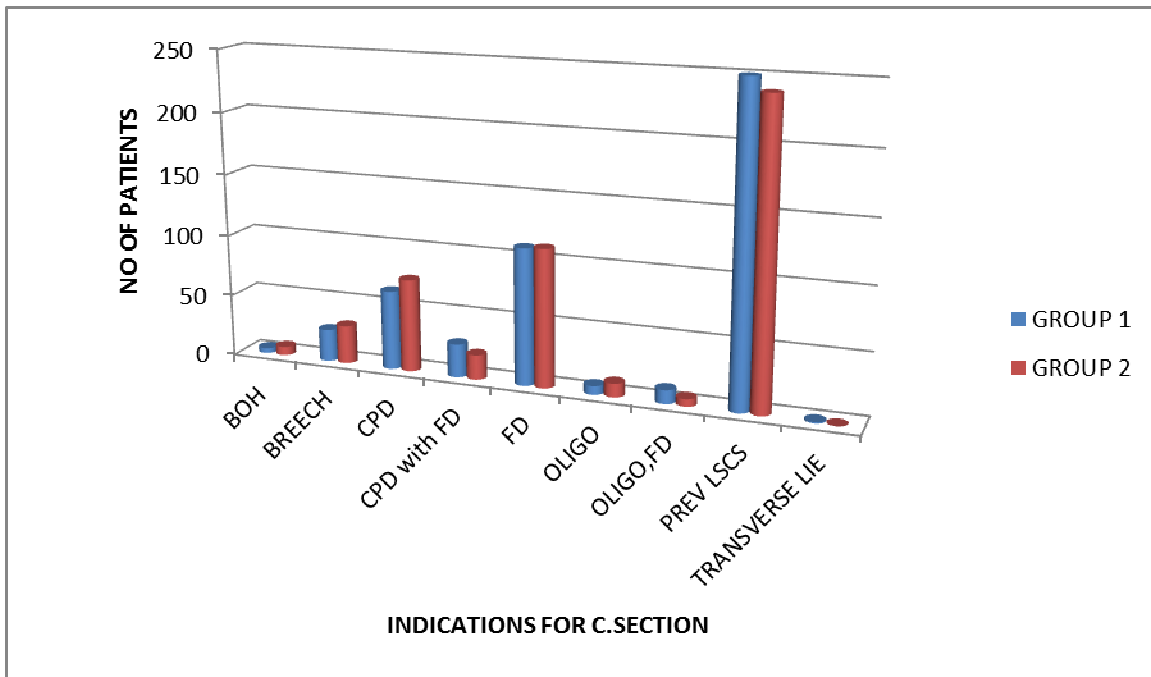
**INDICATIONS FOR LSCS**

**TABLE – 4**

<b>INDICATION</b>	<b>GROUP 1</b>		<b>GROUP 2</b>	
	<b>NO</b>	<b>%</b>	<b>NO</b>	<b>%</b>
<b>BOH</b>	<b>4</b>	<b>0.8</b>	<b>7</b>	<b>1.4</b>
<b>Breech</b>	<b>26</b>	<b>5.2</b>	<b>31</b>	<b>6.2</b>
<b>CPD</b>	<b>64</b>	<b>12.8</b>	<b>75</b>	<b>15</b>
<b>CPD with Fetal Distress</b>	<b>27</b>	<b>5.4</b>	<b>20</b>	<b>4.0</b>
<b>Fetal distress</b>	<b>110</b>	<b>22</b>	<b>111</b>	<b>22.2</b>
<b>Severe Oligohydramnios</b>	<b>7</b>	<b>1.4</b>	<b>11</b>	<b>2.2</b>
<b>Oligohydramnios with fetal distress</b>	<b>11</b>	<b>2.2</b>	<b>6</b>	<b>1.2</b>
<b>Previous LSCS</b>	<b>250</b>	<b>50</b>	<b>239</b>	<b>47.8</b>
<b>Transverse lie</b>	<b>1</b>	<b>0.2</b>	<b>0</b>	<b>0</b>

Table – 4: shows the Indication for LSCS in both Group – I & Group - 2

## INDICATIONS FOR LSCS



The above bar diagram shows the Indications for LSCS in both Group – 1 & Group – 2.

The most common indication among both the group is Previous caesarean section followed by fetal distress and Cephalopelvic disproportion.

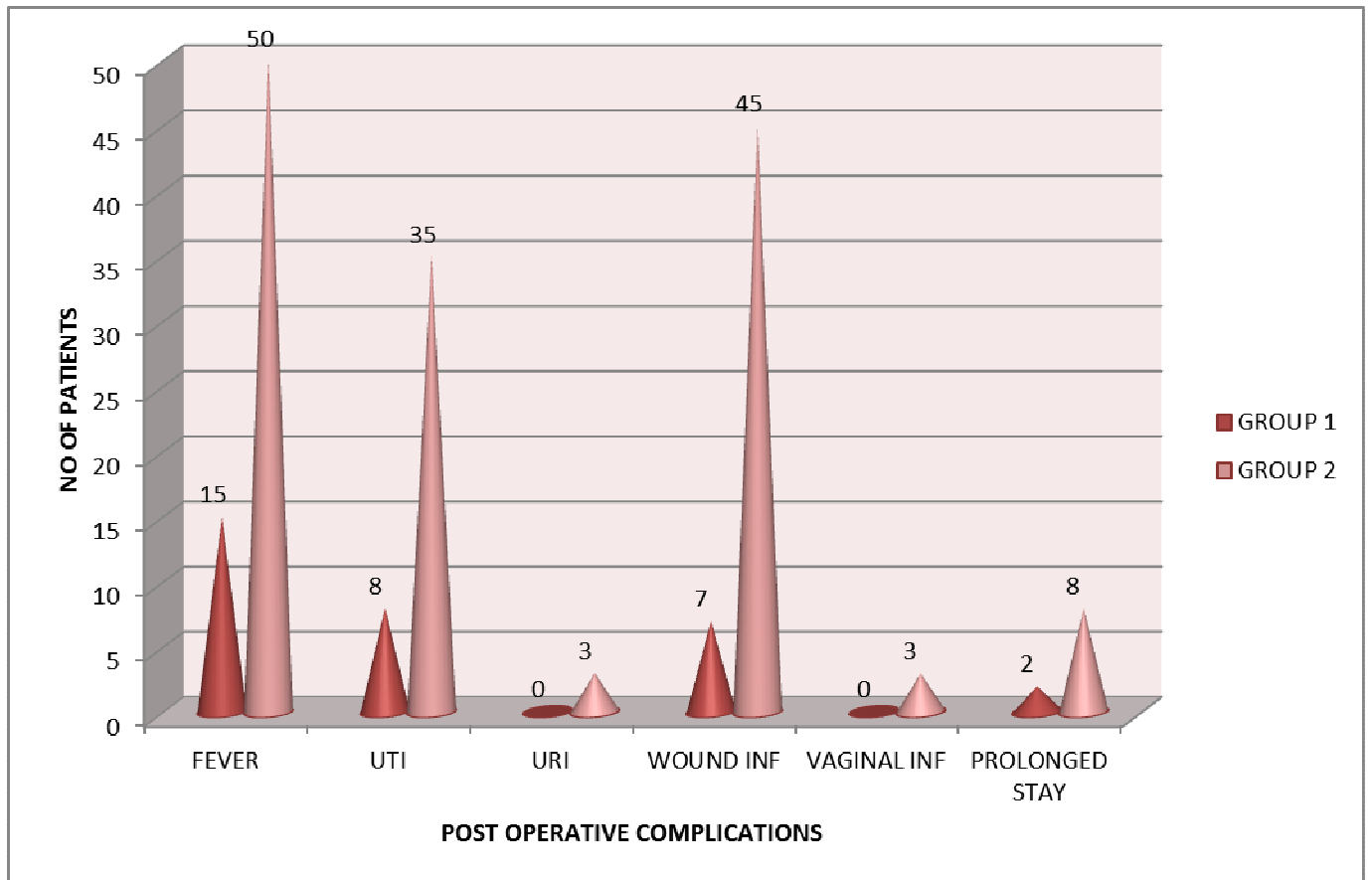
**POST OPERATIVE MORBIDITY**

**TABLE 5**

<b>RESULTS</b>	<b>GROUP 1</b>		<b>GROUP 2</b>		<b>P VALUE</b>	<b>SIGNIFICANCE</b>
	<b>NO</b>	<b>%</b>	<b>NO</b>	<b>%</b>		
<b>Fever</b>	<b>15</b>	<b>3.0</b>	<b>50</b>	<b>10</b>	<b>&lt;0.05</b>	<b>Significant</b>
<b>UTI</b>	<b>8</b>	<b>1.6</b>	<b>35</b>	<b>7</b>	<b>&lt;0.05</b>	<b>Significant</b>
<b>Respiratory Infection</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0.6</b>	<b>&gt;0.05</b>	<b>Not Significant</b>
<b>Wound Infection</b>	<b>7</b>	<b>1.4</b>	<b>45</b>	<b>9.0</b>	<b>&lt;0.05</b>	<b>Significant</b>
<b>Vaginal Infection</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0.6</b>	<b>&gt;0.05</b>	<b>Not Significant</b>

Table – 5: shows the Post-Operative morbidity of 1000 patients undergone LSCS in Group- I & II.

## POST OPERATIVE MORBIDITY



**TABLE – 6**  
**FEVER DISTRIBUTION IN THE TWO GROUPS**

FEVER PRESENT	TOTAL	GROUP 1	GROUP 2
NO OF PATIENTS	65	15	50
% WITHIN GROUP	6.5	3	10
% WITHIN FEVER PTS	100	23.1	76.9

**Table -6 shows the incidence of fever in both the groups.**

Total number of patients with fever – 65

Incidence of fever in group 1 is 3% compared to 10% in group 2.

Of the total 65 patients with fever, 23.1% belonged to group 1 and 76.9 % to group

**TABLE – 7:****INCIDENCE OF UTI IN BOTH GROUPS**

UTI PRESENT	TOTAL	GROUP 1	GROUP 2
NO OF PATIENTS	43	8	35
% WITHIN GROUP	4.3	1.6	7
% WITHIN PATIENTS HAVING UTI	100	18.6	81.4

**Table 7 shows the incidence of UTI in both the groups**

Total number of patients with UTI – 43

Incidence of UTI in group 1 is 1.6 % compared to 7% in group 2.

Of the total 43 patients with UTI , 18.6 % belonged to group 1 and 81.4 % belonged to group 2.



**TABLE – 8:**  
**INCIDENCE OF WOUND INFECTION IN BOTH GROUPS**

<b>WOUND INFECTION</b>	<b>TOTAL</b>	<b>GROUP 1</b>	<b>GROUP 2</b>
<b>NUMBER OF PATIENTS</b>	52	7	45
<b>% WITHIN GROUP</b>	5.2	1.4	9.0
<b>% WITHIN PTS HAVING WOUND INFECTION</b>	100	13.5	86.5

**Table 8 shows the incidence of wound infection in both groups.**

Total number of patients with wound infection – 52

Incidence of wound infection in group 1 is 1.4% compared to 9% in group 2.

86.5% of the total patients with wound infection belonged to group 2, only 13.5 % belonged to group 1.

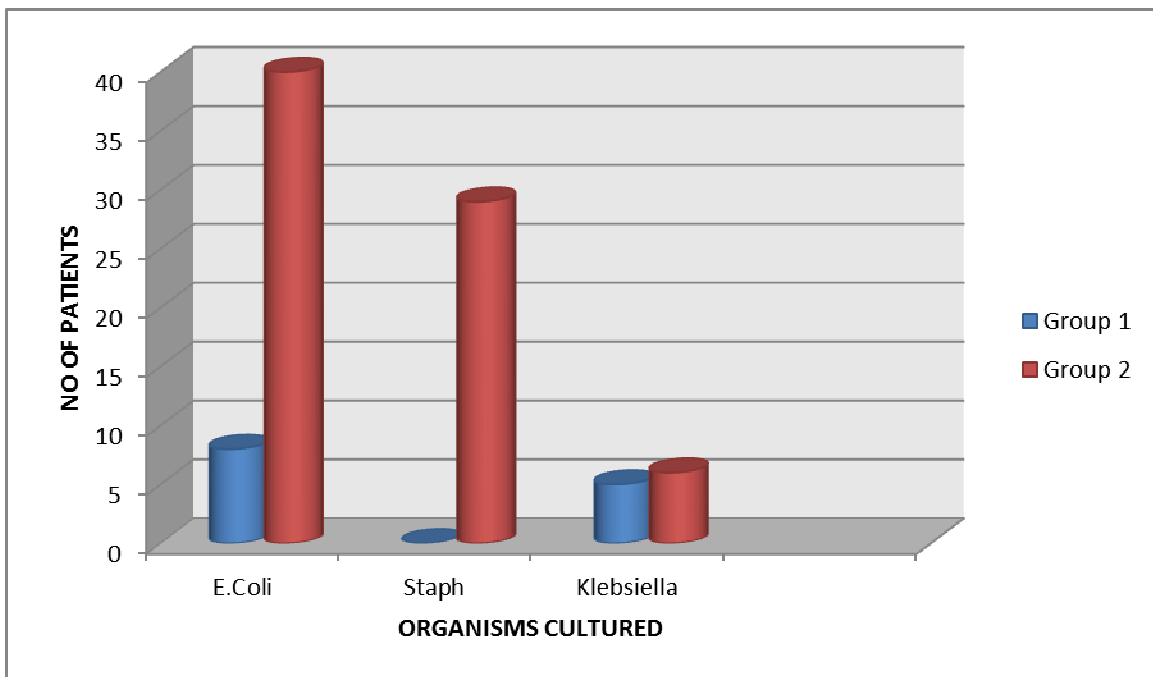
**ORGANISMS CULTURED**

**TABLE – 9**

<b>Organisms Cultured</b>	<b>GROUP 1</b>		<b>GROUP 2</b>	
	<b>NO</b>	<b>%</b>	<b>NO</b>	<b>%</b>
<b>E.COLI</b>	<b>8</b>	<b>1.6</b>	<b>40</b>	<b>8.0</b>
<b>STAPHYLOCOCCUS</b>	<b>5</b>	<b>1.0</b>	<b>29</b>	<b>5.8</b>
<b>KLEBSIELLA</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>1.2</b>

**TABLE – 6: shows the organisms cultured in group -1 and group -2**

**ORGANISMS CULTURED IN BOTH THE GROUPS:**



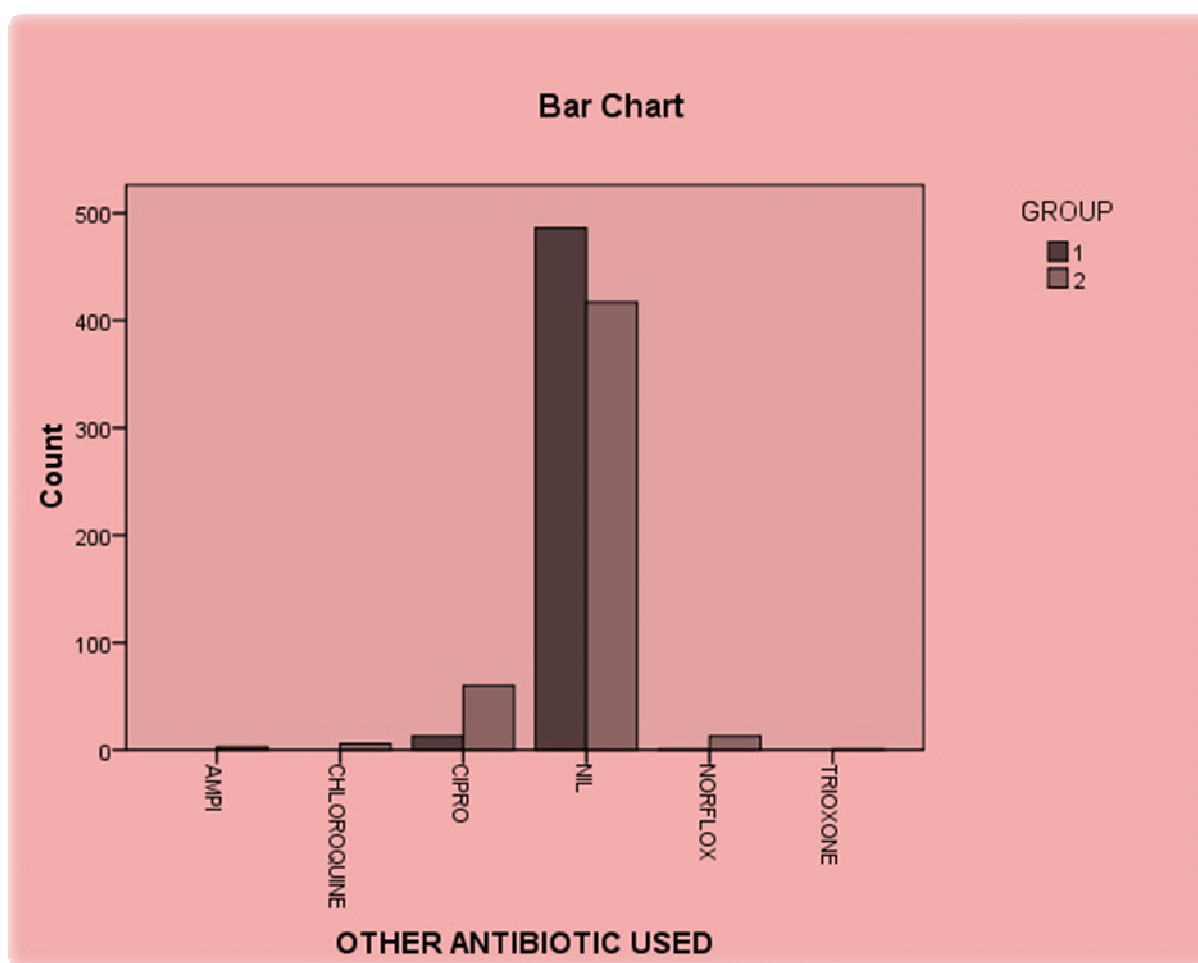
**TABLE -10**  
**OTHER ANTIBIOTICS USED**

<b>ANTIBIOTIC USED</b>	<b>GROUP 1</b>		<b>GROUP 2</b>	
	<b>NO</b>	<b>%</b>	<b>NO</b>	<b>%</b>
<b>Ampicillin</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0.6</b>
<b>Chloroquine</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>1.2</b>
<b>Ciprofloxacin</b>	<b>13</b>	<b>2.6</b>	<b>60</b>	<b>12</b>
<b>Ceftriaxone</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0.2</b>
<b>Norfloxacin</b>	<b>1</b>	<b>0.2</b>	<b>13</b>	<b>2.6</b>

**TABLE -7: shows other antibiotics used by group -1 and group -2**

**P value < 0.05, significant.**

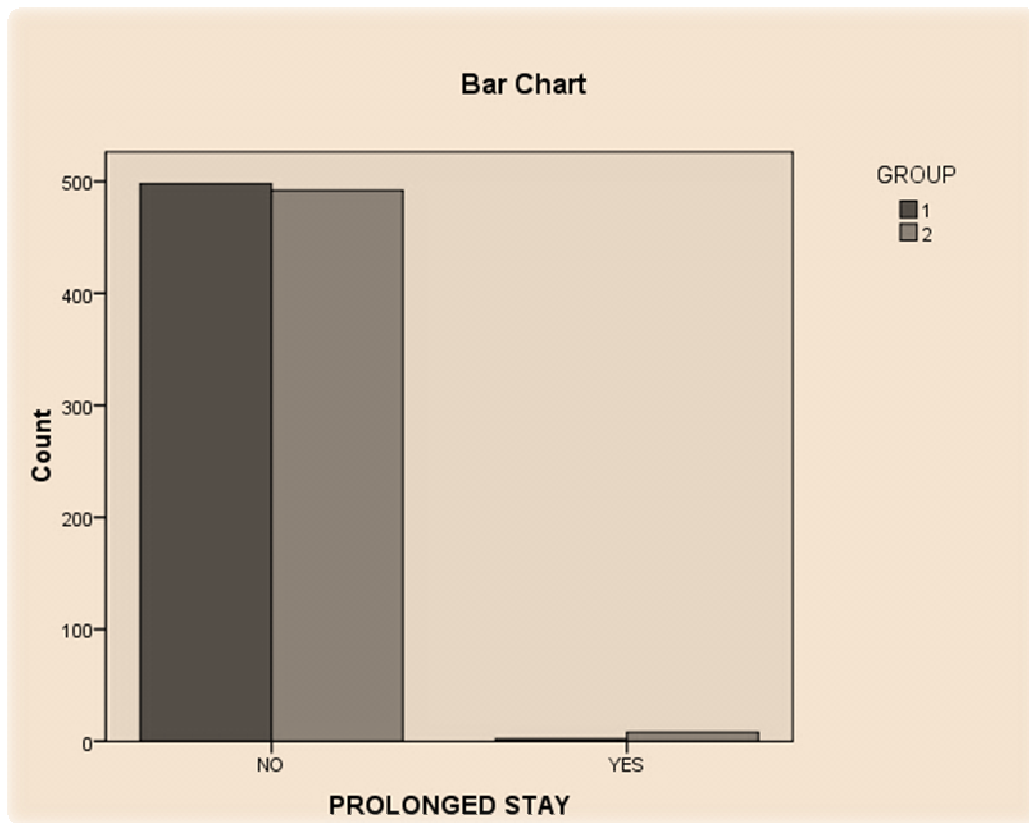
## OTHER ANTIBIOTICS USED



## PROLONGED HOSPITAL STAY

**GROUP -1: 2 Cases**

**GROUP -2: 8 Cases**

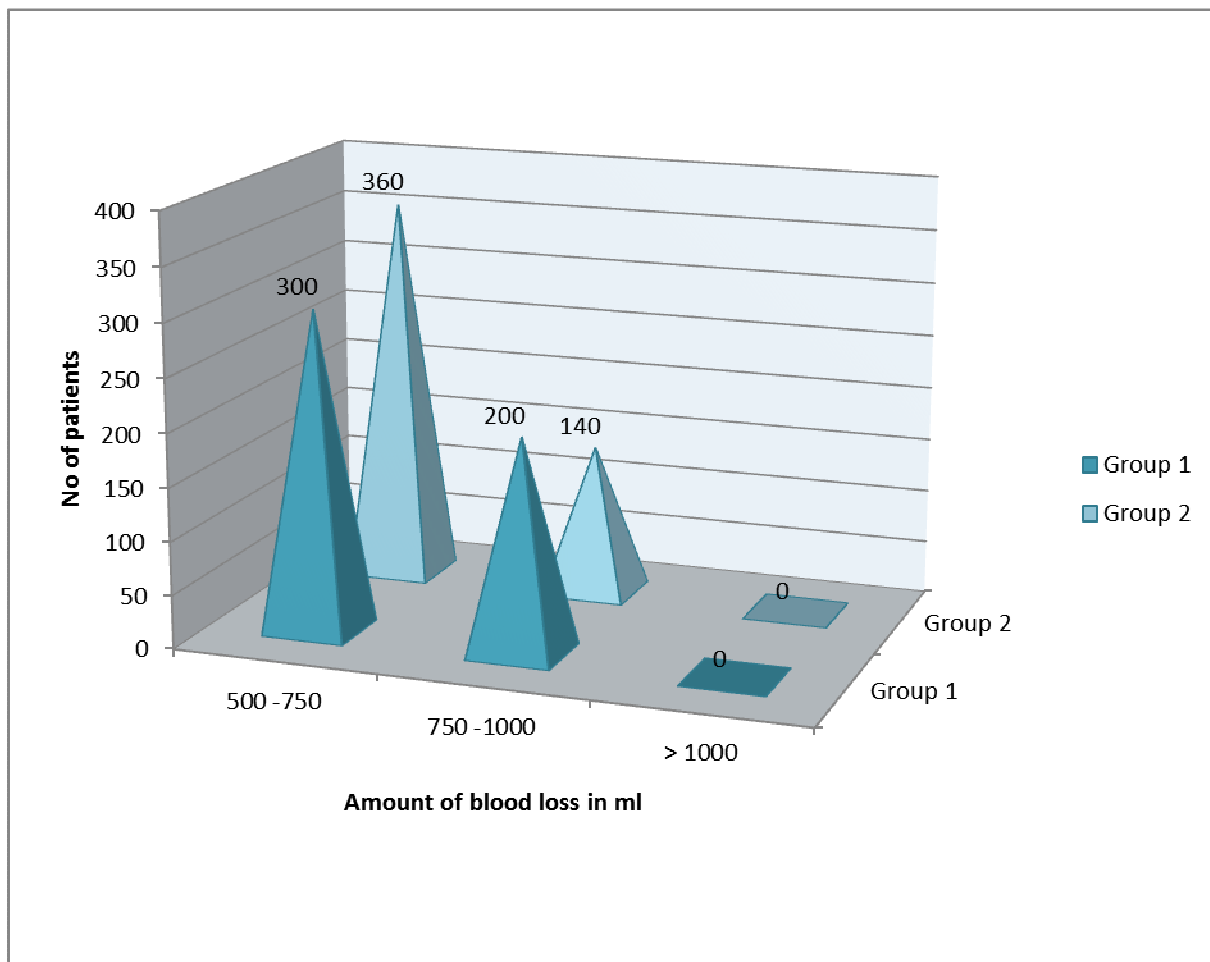


**TABLE 11: BLOOD LOSS DURING SURGERY**

<b>BLOOD LOSS</b>	<b>GROUP 1</b>		<b>GROUP2</b>	
	No	%	No	%
<b>500 - 750</b>	300	60	360	72
<b>750 - 1000</b>	200	40	140	28
<b>&gt;1000</b>	-	-	-	-

Table 8: shows the amount of blood loss in the 2 groups of patients who underwent Caesarean section.

**BAR DIAGRAM: DEPICTS THE AMOUNT OF INTRA- OPERATIVE BLOOD LOSS IN BOTH GROUPS.**





# **DISCUSSION**

## DISCUSSION

The aim of prophylactic antibiotics is to reduce the post-partum infection and its complications thereby reducing the post-operative morbidity and mortality.

Antibiotic prophylaxis for caesarean section is to be administered peri-operatively, so as to ensure a high plasma concentration of antibiotic in the plasma during the operation. Various studies done recently in obstetric cases proved that there is a definite role of prophylactic antibiotics in caesarean section. (Huam et al 1997 27 and Sulovic V et al 1994 25, Bagratee 200130).

Before the use of prophylactic antibiotics routinely for caesarean section, the febrile morbidity and endomyometritis rates were 36% and 32% respectively. These declined to 14% and 6% respectively, in study of Saltzman et al (1985)10.

**TABLE – 1**  
**FEBRILE MORBIDITY**

	<b>Group – 1</b>	<b>Group – 2</b>
Kristenesen 1990	2%	19.2%
Saltzman 1985	14%	32.7%
Itskovitz J 1979	16%	30%
Huam 1997	8%	18%
Bagratee 2001	8.3%	7.9%
Mancuso 1989	8%	9.6%
Sulovic 1994	12.5	24.2
Study Group	<b>3%</b>	<b>10%</b>

From the present study, only 3% of patients belonging to group 1 i.e., patient who received prophylactic antibiotic developed fever compared to 10% of patients who received regular post-operative antibiotic.

Of the total 1000 patients, 65 patients developed febrile morbidity of which only 23.1% belonged to group 1 and almost 76.9% belonged to group 2.

'p' value was calculated to be  $< 0.05$ . Hence there is a statistically significant reduction in febrile morbidity with Inj.Cefotaxime 2 gms intravenous.

In group 1, out of the total 15 patients who developed fever, 8 patients had urinary tract infection, 7 patients had wound infection.

E.coli was grown in culture for 7 patients on day2 and Staphylococcus for 5 patients on day2. For 1 patient, E.coli was grown in culture on day5.

Remaining patients had only a low grade fever without any bacterial growth and the fever subsided in 48 hrs.

Other antibiotics used were ciprofloxacin and norfloxacin. One patient with wound infection was retained in hospital until healing of the wound.

In group 2, 20 patients had urinary infection, 21 patients had wound infection and 1 patient had vaginal infection.

E.coli was grown in culture for 19 patients on day 2 and 1 patient on day5. Staphylococcus growth was seen in 14 patients and Klebsiella in 3 patients.

Other antibiotics used were ciprofloxacin, norfloxacin, ceftriaxone. 6 patients were smear positive for malarial parasite and were started on chloroquine. Wound resuturing was done for 4 patients.

**TABLE – 2**  
**WOUND INFECTION**

	Group 1	Group 2
Huam 1997	3%	13%
Bagratee 2001	12.5%	13.3%
Mallaret 1990	12.5%	26%
M.K. Swamy 1998	4%	16%
Brar et al 1998	8%	28%
Study Group	<b>1.4%</b>	<b>9%</b>

Table 2 shows the wound infection rate in various studies

From this study, only 1.4% of group 1 patients developed wound infection as compared to 9% with group 2 patients.

Totally about 52 patients developed wound infection from both the groups but nearly 86.5% of them belonged to group 2 and remaining only to group 1.

The 'p' value was <0.05, that is statistically significant. Hence there is a considerable reduction in wound infection when Inj.Cefotaxime was used prophylactically.

In group1, of the 7 patients who developed wound infection, 5 had culture sensitivity positive for Staphylococci and 1 patient had culture sensitivity positive for E.coli.

In group 2, of the 45 patients who had wound infection, 29 patients had culture sensitivity positive for Staphylococci and 5 patients had culture sensitivity positive for E.coli.

**TABLE 3:**  
**URINARY TRACT INFECTION**

	<b>Group -I</b>	<b>Group - II</b>
Agarwal 1993	Nil	6%
Batra 1994	4%	8%
M.K. Swamy 1998	2%	22%
Brar et al 1999	12%	32%
Study Group	<b>1.6%</b>	<b>7.0%</b>

Table 3 shows the incidence of Urinary Tract Infection from various studies

The present study shows that only 1.6% (8 patients) of patients belonging to prophylactic antibiotic group developed UTI compared to 7.0% (35 patients) patients in post-operative antibiotic group.

Of the 43 patients who developed UTI totally, 81.4% came under group2 and only 18.6% under group 1.

‘p’ value was found to be less than 0.05 that was statistically significant. Hence use of prophylactic antibiotic, Inj.Cefotaxime at the time of cord clamping showed significant reduction in occurrence of UTI.

In group 1, 7 patients had E.coli grown in culture. In group 2, 29 patients positive for E.coli, 4 Staphylococcus and 6 Klebsiella. Most of them received Ciprofloxacin and a very few Norfloxacin.



# **SUMMARY**

## SUMMARY

- 1) 500 cases were allotted under group 1 and they received Inj.Cefotaxime 2 gms i.v at the time of cord clamping as prophylaxis.
- 2) 500 cases allotted under group 2 received only post- operative antibiotic Inj. Cefotaxime 1 gm i.v twice daily for 5 days. The antibiotic was started 4 to 6 hrs after surgery.
- 3) Of the total 1000 patients who underwent caesarean section, almost 926 were emergency caesarean and about 50 % were repeat sections.
- 4) Incidence of febrile morbidity in group 1 was 3% compared to 10% in group 2. Of the total 1000 patients studied, 6.5% developed fever, of which 23.1% belonged to group1 and 73.9% belonged to group 2. The 'p' value was found to be less than 0.01 which is statistically significant.
- 5) Incidence of UTI was 1.6% patients in group 1 and 7% in group 2. Of the total patients under study, 4.3% developed urinary tract infection, of which 18.6% belonged to group 1 and 81.4 % belonged to group 2. 'p' value was found to be less than 0.01 and it is statistically significant.
- 6) Incidence of wound infection in group 1 was 1.4% and 9% in group 2 . The 'p' value was calculated to be less than 0.01 and is statistically significant.

- 7) Respiratory tract infection and vaginal infection were almost absent in group 1 and in group 2 only 3 patients developed the infections. Hence no significance in lowering incidence of URI or vaginal infection from this study.
- 8) Culture and sensitivity showed growth of E.coli in 1.4% and staphylococcus in 1% of the prophylactic group. In group 2, 7.6% were positive for E.coli, 1.2% for Klebsiella and 5.8% for staphylococci. The 'p' value was less than 0.01 and it is statistically significant.
- 9) Ciprofloxacin, norfloxacin and chloroquine were the additional drugs used in group 1. In addition group 2 patients used Ceftriaxone and ampicillin.
- 10) There was not much difference in overall mean hospital stay among the two groups.
- 11) Single dose antibiotic prophylaxis with Cefotaxime was found to be cost effective compared to conventional post-operative antibiotics.

# CONCLUSION

## CONCLUSION

From the present study, single dose antibiotic prophylaxis with Inj.Cefotaxime 2 gms i.v given at the time of cord clamping is safe, cost effective and also effective in reducing the post-operative morbidity in terms of fever, urinary tract infection, wound sepsis, vaginal and uterine infection. It is absolutely beneficial to the community as it prevents infections, prevents unnecessary usage of additional antibiotics, and decreases cost of treatment, development of resistance and post-operative morbidity.

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**PROFORMA**

**PROFORMA****LSCS GROUP:**

Name: Age: I.P.No. :

Address: Ht:

Wt:

G P L A LMP EDD

Menstrual History : DOA :

Marital History: DOS :

Obstetric History : DOD :

Past History :

Present Pregnancy:

Admission for complaints Pain / Safe Confinement:

**GENERAL EXAMINATION**

Temp : Pulse : BP :

RR : RR :

**SYSTEMIC EXAMINATION**

CVS RS

P/A Uterine Ht : Estimate Fetal Weight

Lie : Presentation :

Head: Mobile / Unengaged

CPD : Yes / No

PV:

## INVESTIGATIONS

Hb%

Bl. Group :

Urine : Alb

USG :

Sugar

Deposits

Bl. Sugar :

Culture & Sensitivity :

Indication for Surgery :

Anesthesia :

Type of Surgery : Elective/Emergency

Type of Incision :

Duration of Surgery :

Pre-Operative Antibiotics :

Blood Transfusion : Yes . No

Post-Operative Period :

Antibiotics :

General Conditions :

Temp. :

Day of Mobilization:

Urinary Tract Infection :

Lung Infection :

Wound Induration:

Wound Sepsis :

Lochia :

Secondary Hemorrhage:

Wound Resuturing:

Adverse Reaction :

Thrombophlebitis :

Condition at the time of discharge:



































MASTER CHART 2

S.NO	NAME	AGE	IP NO	PARITY	TYPE OF SURGERY	INDICATION	BLOOD LOSS DURING SURGERY	POSTOP FEVER	UTI	URI	WOUND INF	VAGINAL INF	ORGANISM CULTURED	OTHER ANTIBIOTIC USED	PROLONGED STAY	
1	HARINI	22	10656	PRIMI	EM.LSCS	CPD	600	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
2	NIRMALA	23	9947	PRIMI	EM.LSCS	CPD	600	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
3	VEENA	29	9766	PRIMI	EM.LSCS	FD	650	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
4	SUMATHI	30	8786	PRIMI	EM.LSCS	FD	650	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
5	HARINI	28	9546	PRIMI	EM.LSCS	OLIGO,FD	700	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
6	JENITA	24	6882	G2P1L1	EL.LSCS,ST	PREV LSCS	700	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
7	SATHYA	27	9797	G2P1L0	EM.LSCS	PREV LSCS	700	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
8	SHABANA	23	11233	G2P1L1	EM.LSCS	PREV LSCS	700	NIL	P	NIL	NIL	NIL	E.COLI	NIL	NOR	NO
9	VALI	27	7156	G2P1L1	EM.LSCS	PREV LSCS	700	NIL	P	NIL	NIL	NIL	E.COLI	NIL	NOR	NO
10	VANI	26	8086	G2P1L1	EM.LSCS,ST	PREV LSCS	700	NIL	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
11	MARIAM	21	6857	PRIMI	EM.LSCS	CPD,FD	600	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
12	RUPA	21	10295	PRIMI	EM.LSCS	FD	650	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
13	SWAPNA	22	11375	PRIMI	EM.LSCS	FD	650	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
14	PREETHA	23	7997	PRIMI	EM.LSCS	FD	650	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
15	PODHUMPONNU	31	8609	G2P1L1	EL.LSCS,ST	PREV LSCS	700	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
16	JAMILA	22	7225	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
17	BANU	23	8907	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
18	RASTHII	24	7846	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
19	SELIN	29	7061	G2P1L1	EM.LSCS,ST	PREV LSCS	800	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
20	SAROJA	30	11385	G2P1L1	EM.LSCS,ST	PREV LSCS	800	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
21	PRIYANKA	22	10578	G3P1L1A1	EM.LSCS,ST	PREV LSCS	850	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO
22	LAKSHMI	22	11213	G3P1L1A1	EM.LSCS,ST	PREV LSCS	850	P	P	NIL	NIL	NIL	E.COLI	NIL	CIPRO	NO

































443	SHYLAJA	28	7611	G4P2L2A1	EM.LSCS,ST	PREV LSCS	850	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
444	GOMATHI	37	10786	G4P2L2A1	EM.LSCS,ST	PREV LSCS	850	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
445	KRIPA	26	10645	G5P1L1A3	EM.LSCS,ST	PREV LSCS	850	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
446	RAMA	30	9050	G5P1L1A3	EM.LSCS,ST	PREV LSCS	850	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
447	DHANYA	30	11561	G5P1L1A3	EM.LSCS,ST	PREV LSCS	850	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
448	MOHANA	31	10302	G5P1L1A3	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
449	VALARMATHI	32	6673	G5P1L1A3	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
450	RANI	25	7074	G2P1L1	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
451	KAVYA	26	7478	G2P1L1	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
452	SUBHA	27	6874	G2P1L1	EM.LSCS	BREECH	600	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	CHLOR	NO
453	GOWRI	22	9879	G3A2	EM.LSCS	CPD	600	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
454	NADHIYA	26	7530	PRIMI	EM.LSCS	CPD	600	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
455	AYSHA	28	9850	PRIMI	EM.LSCS	CPD	600	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
456	BANUMATI	20	7763	G2A1	EM.LSCS	FD	600	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	CHLOR	NO
457	KRITHIGA	26	7368	PRIMI	EM.LSCS	FD	650	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	CHLOR	NO
458	LATHA	25	6142	PRIMI	EM.LSCS	OLIGO,FD	650	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	CHLOR	NO
459	GOWRI	25	9754	PRIMI	EM.LSCS	OLIGO,FD	700	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
460	CHITHRA	28	9998	G2P1L1	EM.LSCS	PREV LSCS	700	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	CHLOR	NO
461	GRACE	22	11092	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	CHLOR	NO
462	BHAVANI	23	10083	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
463	PRABHA	24	6781	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
464	JASMINE	25	9833	G2P1L1	EM.LSCS,ST	PREV LSCS	700	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
465	DHEEBA	27	10902	G3P1L1A1	EM.LSCS,ST	PREV LSCS	850	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
466	SEETHA	26	10806	PRIMI	EM.LSCS	FD	650	NIL	P	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NO
467	RAJI	26	6975	PRIMI	EM.LSCS	CPD	600	NIL	NIL	P	NIL	NIL	NIL	NIL	NIL	AMPI	NO
468	RENUKA	24	8754	G2P1L1	EM.LSCS,ST	PREV LSCS	700	NIL	NIL	P	NIL	NIL	NIL	NIL	NIL	AMPI	NO
469	AMBIKA	25	9021	G2P1L1	EM.LSCS,ST	PREV LSCS	700	NIL	NIL	P	NIL	NIL	NIL	NIL	NIL	AMPI	NO
470	SUDHA	24	11345	G2P1L1	EM,LSCS,	PREV LSCS	900	NIL	NIL	NIL	P	NIL	NIL	NIL	NIL	NIL	NO
471	KARTHIKA	20	6869	G3P1L1A1	EM.LSCS,ST	PREV LSCS	850	NIL	NIL	NIL	NIL	P	NIL	E.COLI	CIPRO	YES	
472	JANANI	23	9476	PRIMI	EM.LSCS	CPD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO	

473	THASLEEM	25	8700	PRIMI	EM.LSCS	CPD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
474	SARANYA	27	6832	PRIMI	EM. LSCS	FD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
475	CHITHRA	30	7960	G3P1L1A1	EM.LSCS	FD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
476	MALINI	19	7212	PRIMI	EM.LSCS	FD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
477	GEETHA	21	7801	PRIMI	EM.LSCS	FD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
478	KOWSAR	28	6312	G2P1L1	EM.LSCS,ST	FD	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	NOR	NO
479	REKHA	26	11477	G2P1L1	EL.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
480	MUTHU	29	9413	G2P1L1	EL.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
481	DHARINI	28	8835	G2P1L0	EM.LSCS	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	YES
482	HEMAVATHI	30	10246	G2P1L1	EM.LSCS	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
483	DEEPA	23	8221	PRIMI	EM.LSCS	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
484	SUMITHRA	22	6956	G2P1L1	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
485	SHANAZ	22	10612	G2P1L1	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	NOR	NO
486	BAKYA	26	9017	G3P2L2	EM.LSCS,ST	PREV LSCS	900	NIL	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
487	MUNIAMMA	25	9737	PRIMI	EM.LSCS	BREECH	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
488	PREETHI	23	10526	PRIMI	EM.LSCS	CPD	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
489	JANAKI	24	7129	G2P1L1	EM.LSCS,ST	CPD	900	P	NIL	NIL	P	NIL	STAPH	NIL	TRIOX	YES
490	RAMANI	18	10398	PRIMI	EM.LSCS	FD	900	P	NIL	NIL	P	NIL	STAPH	NIL	NOR	YES
491	DEVI	21	7465	PRIMI	EM.LSCS	FD	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
492	MANIKAM	23	8381	PRIMI	EM.LSCS	FD	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
493	JOTHI	26	9287	PRIMI	EM.LSCS	FD	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
494	POORNAM	26	10296	PRIMI	EM.LSCS	FD	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
495	VALAR	32	10580	G2P1L1	EL.LSCS,ST	PREV LSCS	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
496	MALINI	33	10204	G2P1L1	EL.LSCS,ST	PREV LSCS	900	P	NIL	NIL	P	NIL	STAPH	NIL	NOR	NO
497	SARANYA	27	10284	G2P1L1	EM.LSCS	PREV LSCS	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
498	SAROJA	21	10738	G2P1L1	EM.LSCS,ST	PREV LSCS	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
499	DEVI	27	9820	G3P1L1A1	EM.LSCS,ST	PREV LSCS	900	P	NIL	NIL	P	NIL	STAPH	NIL	CIPRO	NO
500	ARCHANA	24	7555	G3P1L1A1	EM.LSCS,ST	PREV LSCS	900	P	NIL	NIL	P	P	STAPH	E.COLI	CIPRO	YES



## **Key to Master Chart:**

BOH	- Bad Obstetric History
CPD	- Cephalo Pelvic Disproportion
FD	- Fetal Distress
OLIGO	- Oligohydramnios
PREV LSCS	- Previous Lower Segment Caesarean Section
EM LSCS	- Emergency Lower Segment Caesarean Section
EL LSCS	- Elective Lower Segment Caesarean Section
UTI	- Urinary Tract Infection
URI	- Upper Respiratory Infection
INF	- Infection
NOR	-Norfloxacin
CIPRO	- Ciprofloxacin
STAPH	- Staphylococcus
E.COLI	- Escherichia coli

KLEB - Klebsiella

P - Present

TRAN LIE - Transverse lie

CHLOR - Chloroquine

TRIOX - Ceftri

## சுய ஒப்புதல் படிவம்

**ஆய்வு செய்யப்படும் தலைப்பு:** "குழந்தைபெறும் அறுவை சிகிச்சையின் போதே உபயோகிக்கும் கிருமி எதிர்ப்பு மருந்திற்க்கும், அறுவை சிகிச்சைக்குப் பின்னர் உபயோகிக்கும் கிருமி எதிர்ப்பு மருந்திற்கும் இடையே உள்ள நோய் எதிர்ப்புச் சக்தியின் வித்தியாசத்தை கண்டறியும் ஆய்வு".

ஆராய்ச்சி நிலையம் : சமூக மகப்பேறியல் மற்றும் அரசு கஸ்தூரிபாய் காந்தி தாய்-சேய் நல மருத்துவமனை  
சென்னை மருத்துவக் கல்லூரி மற்றும் மருத்துவமனை  
சென்னை-600 003.

பங்குபெறுபவரின் பெயர் :

பங்குபெறுபவரின் எண்:

மேலே குறிப்பிட்டுள்ள மருத்துவமனை ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் விளக்கப்பட்டுள்ளது.

நான் இவ்வாய்வில் தன்னிச்சையாகத்தான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்டசிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.

இந்த ஆய்வு சம்மந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும்போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன்.

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும், மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக் கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனத்துடன் சம்மதிக்கிறேன்.

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன், இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்றும் உறுதியளிக்கிறேன். என் உடல் நலம் பாதிக்கப்பட்டாலோ அல்லது எதிர்பாராத வழக்கத்திற்கு மாறான நோய்க் குறி தென்பட்டாலோ உடனே அதை மருத்துவ அணியிடம் தெரிவிப்பேன் என உறுதி அளிக்கிறேன்.

பங்கேற்பவரின் கையொப்பம் ..... இடம் ..... தேதி .....

பங்கேற்பவரின் பெயர் மற்றும் விலாசம் .....

ஆய்வாளரின் கையொப்பம் ..... இடம் ..... தேதி .....

ஆய்வாளரின் பெயர் .....

## தகவல் படிவம்

**ஆய்வு செய்யப்படும் தலைப்பு :** "குழந்தைபெறும் அறுவை சிகிச்சையின் போதே உபயோகிக்கும் கிருமி எதிர்ப்பு மருந்திற்கும், அறுவை சிகிச்சைக்குப் பின்னர் உபயோகிக்கும் கிருமி எதிர்ப்பு மருந்திற்கும் இடையே உள்ள நோய் எதிர்ப்புச் சக்தியின் வித்தியாசத்தை கண்டறியும் ஆய்வு".

**ஆய்வாளர் :** மருத்துவர் M தீபாமங்களம்,  
சமூக மகப்பேறியல் மற்றும் அரசு கஸ்தூரிபாய் காந்தி தாய் சேய் நல மருத்துவமனை,  
சென்னை மருத்துவக் கல்லூரி,  
சென்னை - 600 003.

**ஆய்வின் நோக்கம் :** அறுவை சிகிச்சையின் மூலம் குழந்தை பெறும் தாய்மார்களுக்கு கிருமி எதிர்ப்பு மருந்தின் மூலம் நோய்க்கிருமிகள் தாக்காமல் இருப்படை கண்டறிவதே இந்த ஆய்வின் நோக்கம்.

அறுவை சிகிச்சை செய்து குழந்தையை எடுத்தவுடன் தொப்புள் கொடியை நறுக்குவதற்கு முன்பாகவே, இந்த கிருமி எதிர்ப்பு மருந்தினை தாய்க்கு செலுத்துவதன் மூலம் நோய் அறுவை சிகிச்சைக்குப் பின் ஏற்படும் தொற்று நோய்களை தடுப்பதற்காக இந்த ஆய்வு மேற்கொள்ளப்படுகிறது.

இந்த சிகிச்சையின் மூலம் நோயாளிகளுக்கு கிடைக்கும் பலனை ஆய்வு செய்வதே இந்த ஆய்வின் நோக்கமாகும்.

இந்த ஆய்வில் பங்கு பெறுவது நோயாளிகளின் சொந்த விருப்பத்திலேயே ஆகும். இந்த ஆய்வினால் நோயாளிகளுக்கு எந்த செலவும் இருக்காது. இந்த ஆய்வையொட்டி எந்தவிதமான சந்தேகங்களுக்கும் விளக்கம் பெற நோயாளிகளுக்கு உரிமை உள்ளது. இந்த ஆய்வின் முடிவுகள் இறுதியில் பிரசுரிக்கப்படும்.

**CONSENT FORM**

**STUDY TITLE** : "COMPARISON OF PROPHYLACTIC VERSUS REGULAR USE OF ANTIBIOTIC IN CAESARIAN SECTION".

**STUDY CENTRE** : Institute of Social Obstetrics and Govt. KGH, Chennai.

**PARTICIPANT NAME** : **AGE:** **SEX:** **J.D.NO.**

I confirm that I have understood the purpose of procedure for the above study, I have the opportunity to ask the question and all my questions and doubts have been answered to my satisfaction.

I have been explained about the possible complications that may occur during the procedure, I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving any reason.

I understand that investigator, regulatory authorities and the ethics committee will not need my permission to look at my health records both in respect to the current study and any further research that may be conducted in relation to it, even if I withdraw from the study. I understand that my identity will not be revealed in any information released to third parties of published, unless as required under the law. I agree not to restrict the use of any or results that arise from the study.

I hereby consent to participate in this study of "**COMPARISON OF PROPHYLACTIC VERSUS REGULAR USE OF ANTIBIOTIC IN CAESARIAN SECTION**".

Signature of Investigator:

Place :

Date :

Study Investigators Name

Institution

Signature / Thumb Impression of patient

Thanking you,

Yours faithfully,



**INSTITUTIONAL ETHICS COMMITTEE**  
**MADRAS MEDICAL COLLEGE, CHENNAI -3**

Telephone No : 044 25305301

Fax : 044 25363970

**CERTIFICATE OF APPROVAL**

To  
Dr. M. Deepamangalam  
PG in MDOG  
KGH / Madras Medical College, Chennai -3

Dear Dr. M. Deepamangalam

The Institutional Ethics committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled " Comparison of prophylactic versus regular use of antibiotic in caesarean section " No. 11012012.


The following members of Ethics Committee were present in the meeting held on 27.01.2012 conducted at Madras Medical College, Chennai -3.

- |  |                     |
|--|---------------------|
| 1. Prof. S.K. Rajan. MD  | -- Chairperson      |
| 2. Prof. Pregna B. Dolia MD<br>Vice Principal, Madras Medical College, Chennai -3<br>(Director , Institute of Biochemistry, MMC, Ch-3) | -- Member Secretary |
| 3. Prof. B. Kalaiselvi. MD<br>Prof of Pharmacology ,MMC, Ch-3  | -- Member           |
| 4. Prof. Shruti Kamal MS<br>Prof of Surgery, Madras Medical College , Ch-3   | -- Member           |
| 5. Thiru. S. Govindsamy. BA BL   | -- Lawyer           |

We approve the proposal to be conducted in its presented form.

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

  
Member Secretary, Ethics Committee

# PLAGIARISM REPORT

TNMGRMU APRIL 2013 EXAMINATIO Medical - DUE 31-Dec-2012 What's New

Originality GradeMark PeerMark

**COMPARISON OF PROPHYLACTIC**  
BY DEEPAMANGALAM 20101502 M.D. OBSTETRICS AND GYNAECOLOGY

turnitin 10% SIMILAR -- OUT OF 0

**REGULAR USE OF ANTIBIOTIC  
IN CAESAREAN SECTION**


20  
Dissertation submitted to

**THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY**

*In partial fulfillment of the regulations  
For the award of the degree of*

**M.D. BRANCH-II**

**OBSTETRICS AND GYNECOLOGY**



**MADRAS MEDICAL COLLEGE**

**CHENNAI**

**APRIL 2013**

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