

# Study of Evaluation of Antimicrobial Usage Pattern in Uncomplicated Caesarean Section: An Institutional Based Study

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## ABSTRACT

**Background:** Studies from various populations demonstrated that an estimated 3% to 12% of all caesarean deliveries were complicated by surgical site infection. The present study was conducted to assess antimicrobial usage pattern in uncomplicated caesarean section.

**Materials and Methods:** A prospective observational study was carried out to assess antimicrobial usage pattern in uncomplicated caesarean section. The following Study variables were analysed: Age of the patient, Gravity, Types of C-section either elective or emergency, Class of antimicrobials prescribed, Number of antimicrobials prescribed, any fixed dose combination used, Duration of therapy- parenteral and oral, Outcome in terms of infections occurred in the follow up period of one month. The recorded data was compiled, and data analysis was done.

**Results:** A total of 400 cases were included in the study & maximum patients belonged to age group 18-30yrs. Maximum patients belonged to primigravida (71.5%). Emergency C-section was performed in 60% patients. In maximum patients (48.25%) parenteral antimicrobials used in Caesarean Section was combination of Ceftriaxone + Metronidazole + Amikacin for 2 days. In maximum patients (51.25%) oral antimicrobials used

in Caesarean Section was Cefuroxime for 6 days. No infection occurs in 60% patients.

**Conclusion:** The present study concluded that appropriate dose with proper duration of antimicrobial therapy in both elective and emergency caesarean Section reduces the infective complication of mother and the newborn.


**Keywords:** Caesarean Section, Antimicrobial, Primigravida.

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## INTRODUCTION

The single most important risk factor for postpartum maternal infection is caesarean section.<sup>1,2</sup> Infectious complications that occur after caesarean births are an important and substantial cause of maternal morbidity and are associated with a significant increase in hospital stay.<sup>3</sup> Infectious complications following caesarean birth include fever (febrile morbidity), wound infection, endometritis (inflammation of the lining of the uterus), and urinary tract infection. There can also occasionally be serious infectious complications including pelvic abscess (collection of pus in the pelvis), bacteremia (bacterial infection in the blood), septic shock (reduced blood volume due to infection), necrotizing fasciitis (tissue destruction in the uterine wall) and septic pelvic vein thrombophlebitis (inflammation and infection of the veins in the pelvis); sometimes these can lead to maternal mortality.<sup>2,4-6</sup> Antimicrobials are very frequently used medications in Obstetrics and Gynaecology in their wide range of operative procedures and

in treating various infections. Administering antimicrobial prophylaxis is a standard practice in caesarean section which is given in pre, intra and postoperative periods.<sup>7,8</sup> Administration of antibiotic prophylaxis within an hour prior to skin incision is more effective in reducing post-caesarean infectious morbidity when compared to administration of the same drugs after cord clamping and has no effect on neonatal infection.<sup>9-13</sup> The present study was conducted to assess antimicrobial usage pattern in uncomplicated caesarean section.

## MATERIALS AND METHODS

A prospective observational study was carried out in Hind Institute of Medical Sciences, Mau, Ataria, Sitapur, Uttar Pradesh (India) to assess antimicrobial usage pattern in uncomplicated caesarean section. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and written

consent was taken from the patient after explaining the study. All consecutive cases of both elective and emergency caesarean section delivery within the study period, who gave informed consent for participating in the study were included. Patients who were having history of associated comorbidities like Diabetes Mellitus, Renal disease, Immunological disorders, both Pre-eclampsia and Eclampsia anticipated to complicate the outcome of caesarean section were excluded from the study. The following Study variables were analysed: 1. Age of the patient 2. Gravidity

3. Types of C-section either elective or emergency 4. Class of antimicrobials prescribed 5. Number of antimicrobials prescribed; any fixed dose combination used. 6. Duration of therapy-parenteral and oral 7. Outcome in terms of infections occurred in the follow up period of one month. Data were recorded in a predesigned case report. Follow up data was also collected. The recorded data was compiled, and data analysis was done using SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). P-value less than 0.05 was considered statistically significant.

**Table 1: Demographic data**

Variable	N=400 (%)
<b>Age group (yrs)</b>	
18-30	236(59%)
31-40	131(32.75%)
Above 50	33(8.25%)
<b>Gravidity</b>	
Primigravida	286(71.5%)
Multigravida (previous history of C-section delivery)	89(22.25%)
Multigravida (previous normal delivery)	25(6.25%)
<b>Type of Caesarean section</b>	
Elective C-section	160(40%)
Emergency C-section	240(60%)

**Table 2: Parenteral Antimicrobials used in Caesarean Section of the study patients with duration.**

Antimicrobials used	N(%)	Average duration of parenteral therapy (days)
Ceftriaxone	18(4.5%)	3
Ceftriaxone + Metronidazole	40(10%)	3
Ceftriaxone + Metronidazole + Amikacin	193(48.25%)	2
Ciprofloxacin	26(6.5%)	3
Ciprofloxacin + Metronidazole	35(8.75%)	3
Co-amoxycylav + Metronidazole	31(7.75%)	3
Co-amoxycylav + Metronidazole + Amikacin	57(14.25%)	2

**Table 3: Oral Antimicrobials used after parenteral therapy in Caesarean Section of the study patients with duration.**

Antimicrobials used	N(%)	Average duration of parenteral therapy (days)
Cefuroxime	205(51.25%)	6
Cefuroxime + Metronidazole	64(16%)	5
Ciprofloxacin	19(4.75%)	6
Ciprofloxacin + Metronidazole	30(7.5%)	6
Co-amoxycylav + Metronidazole	57(14.25%)	6
Co-amoxycylav	25(6.25%)	7

**Table 4: Outcome in terms of infection or no infection after Antimicrobials used.**

Outcome in terms of infection in mother	N(%)
No infection	340(60%)
Wound infection	29(7.25%)
Endometritis	10(2.5%)
Urinary tract infection	12(3%)
Other infections	9(2.25%)

## RESULTS

A total of 400 cases were included in the study & maximum patients belonged to age group 18-30yrs. Maximum patients belonged to primagravida (71.5%). Emergency C-section was performed in 60% patients. In maximum patients (48.25%) parenteral antimicrobials used in Caesarean Section was combination of Ceftriaxone + Metronidazole + Amikacin for 2 days. In maximum patients (51.25%) oral antimicrobials used in Caesarean Section was Cefuroxime for 6 days. No infection occurs in 60% patients.

## DISCUSSION

Postpartum infection remains to be among the top five causes of pregnancy-related maternal mortality and morbidity worldwide.<sup>14-16</sup> Women who undergo caesarean section have a 5-to-20-fold greater risk of postpartum infection than women having a vaginal delivery.<sup>3,17-19</sup>

Cephalexin-metronidazole therapy has broad-spectrum antibiotic coverage and has demonstrated efficacy in the treatment of intra-abdominal infections in nonobstetric patients as well as decreased post caesarean infections when given preoperatively.<sup>20,21</sup>

Cephalexin and metronidazole have high oral bioavailability and pharmacoeconomic advantages and are generally well tolerated, supporting the drug combination as a choice for postpartum prophylactic coverage.<sup>22</sup>

However, a study from Cochrane database systemic review concluded that there was no overall difference in efficacy between the different classes of antibiotics in controlling infections in caesarean section. but the data on bacterial resistance and neonatal sepsis was lacking. A systemic review in Cochrane database of 25 randomised controlled trial inferred from the available evidence that cephalosporins and penicillin's have similar efficacy when immediate postoperative infections are taken into consideration.<sup>23</sup>

A systemic review of 95 studies supported the practice of prophylactic antibiotics to be administered routinely to all women undergoing caesarean section to halt infection.<sup>24</sup>

Use of prophylactic antibiotics for patients undergoing caesarean section has significantly reduced post-operative maternal infection, morbidity and hospital stay.<sup>8,25</sup>

Pre-operative prophylaxis was given in the early rupture of membranes. Fixed-dose combinations were used, the most common being ceftriaxone and sulbactam combination. Incidence of infection even after antimicrobial prophylaxis was reported due to pre-existing infection, debilitating disease or prolonged rupture of membranes. Patients with recurrent infection were shifted to a regime that included amoxicillin and clavulanic acid, ciprofloxacin and tinidazole combination and the duration of treatment was prolonged.<sup>26</sup>

## CONCLUSION

The present study concluded that appropriate dose with proper duration of antimicrobial therapy in both elective and emergency Caesarean Section reduces the infective complication of mother and the newborn.

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