

Antimicrobial Usage Pattern in Uncomplicated Caesarean Section Delivery in a Tertiary care hospital of rural Bengal.

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ABSTRACT

Background: Antimicrobials are very frequently used medications in Obstetrics and Gynaecology in there 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 peroids. The present study was aimed to explore the antibiotic usage pattern in caesarean section in Bankura Sammilani Medical College , Bankura. **Methods:** A prospective observational study was conducted in the Department of Gynaecology and Obstetrics (G&O) in collaboration with the Department of Pharmacology of the Bankura Sammilani Medical College, Bankura. The study was carried out for a period of two months from February to March 2019. **Results:** Among 364 cases mostly were primigravida, commonest prescribed antibiotic being ceftriaxone parenteral followed by cefuroxime by oral route. **Conclusion:** Appropriate dose with proper duration of antimicrobial therapy in both elective and emergency Caesarean Section reduces the infective complication of mother and the new born.

Keywords: antimicrobial, Caesarean Section, primigravida.

INTRODUCTION

The advent of antimicrobials had potentiated the therapeutic ability of the physicians in the last 50 years thus altering the prognoses of the patients with bacterial infections. It proved to be magic drugs in both prophylactic and curative cause. However the casual attitude of physician regarding antibiotic prescription had led to the emergence of resistant microorganism leading to a constant threat to human population. The unnecessary use of broad spectrum and newer generation antibiotics in both human as well as veterinary practice had resulted an uncertain efficacy of antimicrobials at present with scarce newer ones in pipeline.^[1] With the evolution of resistant pathogens the mortality, morbidity along with the treatment cost are all escalating. The hospital antibiotic use is generally determined by the socioeconomic, cultural, behavioural and contextual aspects.^[2] Antimicrobials are very frequently used medications in Obstetrics and Gynaecology in there

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 peroids.^[3,4] The wellbeing of both the mother and the baby is determined by a judicious use of antibiotic. The present study was aimed to explore the antibiotic usage pattern in caesarean section in Bankura Sammilani Medical College (BSMC) which serve a major part of rural population. BSMC is one of the hospital with highest recorded institutional delivery in India. As a result a considerably large population including the new born are getting affected by the antimicrobial therapy. Wherefore the outcome of the antibiotic therapy was also taken into consideration.

MATERIALS AND METHODS

A prospective observational study was conducted in the Department of Gynaecology and Obstetrics (G&O) in collaboration with the Department of Pharmacology of the Bankura Sammilani Medical College, Bankura. The study was carried out for a period of two months from February to March 2019. All consecutive cases of both elective and emergency caesarean section delivery within the

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study period, who gave informed consent for participating in the study were included. However those having a 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

Study Technique

Study was carried out after obtaining permission from the Institutional ethics committee and a duly signed informed consent form from the study participants. Data were recorded in a predesigned case report form from the bed head tickets of the post C-section patients in the Obstetrics ward and through interview with the patients as well as the treating Gynaecologists. Follow up data were collected till they were discharged from the hospital. The last follow up data was procured from the G&O Out Patient Department after one week. The patients were contacted over telephone to ensure their check-up following one week. One month was dedicated for patient recruitment and an additional 7 to 10 days for the follow up of the last recruited patient. The privacy of the patient data were ensured. Data collected were put in the excel spread-sheet and analysed by descriptive statistics.

RESULTS

A total of 648 cases were screened among which 364 fulfilled the inclusion exclusion criteria and were followed up.

A greater proportion of patients belonged to less than 30 years of age with only 1% above 40years.

Table 1: Age distribution of the study patients

Age group (years)	Number of cases	Percentage (n=364)
18- 25	80	22%
26-30	178	49%
31- 35	66	18%
36-40	36	10%
40- above	4	1%

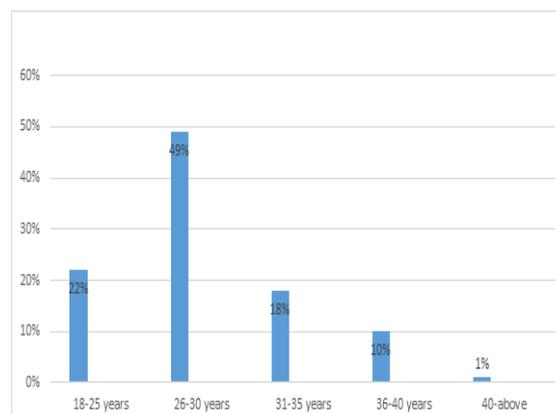


Figure 1: Percentage distribution of sample size according to age

Table 2: Gravidity of the study patients

Gravidity	No of patients	Percentage of total patients (n=364)
Primigravida	276	76%
Multigravida (previous h/o C-section delivery-repeat C/S)	59	16%
Multigravida (previous normal delivery)	29	8%

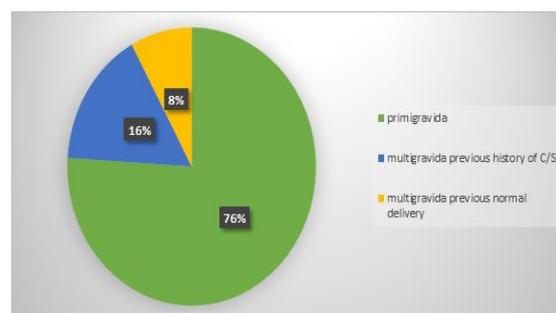


Figure 2: Percentage distribution according to the gravidity of the study participants

Table 3: Types of Caesarean Section of the study patients

Types of C-section	No of patients	Percentage of total patients (n=364)
Elective C-section	153	42%
Emergency C-section	211	58%

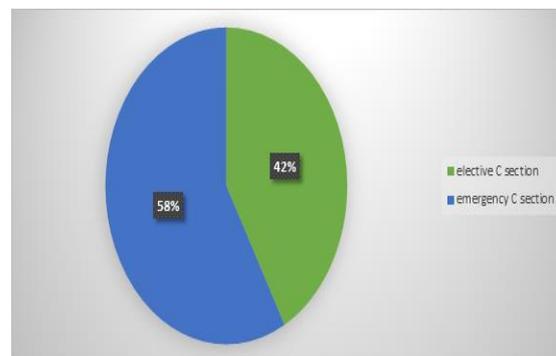


Figure 3: Percentage distribution according to elective and emergency caesarean section.

Table 4: Parenteral Antimicrobials used in Caesarean Section of the study patients with duration

Antimicrobials used	No of patients	Percentage of total patients (n=364) approx.	Average duration of parenteral therapy (days)
Ceftriaxone	22	6%	3
Ceftriaxone +Metronidazole	43	12%	2
Ceftriaxone +Metronidazole + Amikacin	189	52%	2
Ciprofloxacin	14	4%	2.5
Ciprofloxacin+ Metronidazole	29	8%	2.5
Co-amoxyclov + Metronidazole	22	6%	3
Co-amoxyclov + Metronidazole + Amikacin	44	12%	2.5

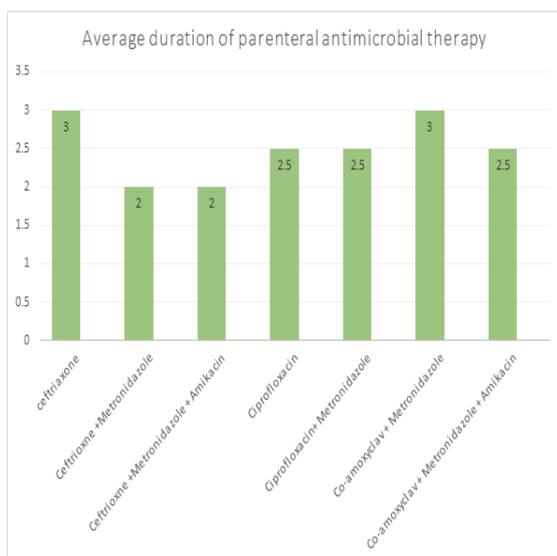


Figure 4: Average duration of parenteral antimicrobial therapy

Table 5: Oral Antimicrobials used after parenteral therapy in Caesarean Section of the study patients with duration

Antimicrobials used	No of patients	Percentage of total patients (n=364) approx.	Average duration of oral therapy (days)
Cefuroxime	197	54%	7
Cefuroxime+Metronidazole	58	16%	5
Ciprofloxacin	14	4%	6.5
Ciprofloxacin+ Metronidazole	29	8%	6
Co-amoxyclov + Metronidazole	44	12%	6.5
Co-amoxyclov	22	6%	7

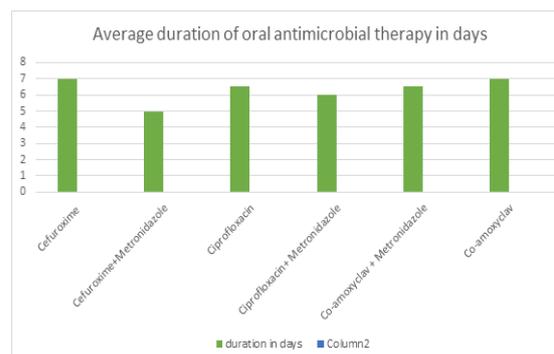


Figure 5: Average duration of oral antimicrobial therapy

Table 6: Outcome in terms of infection or no infection after Antimicrobials used in Caesarean Section of the study patients

Outcome in terms of infection in mother	No of patients	Percentage of total patients (n=364) approx.
No infection	317	87%
Wound infection	25	7%
Endometritis	7	2%
Urinary tract infection	8	2%
Other infections	7	2%

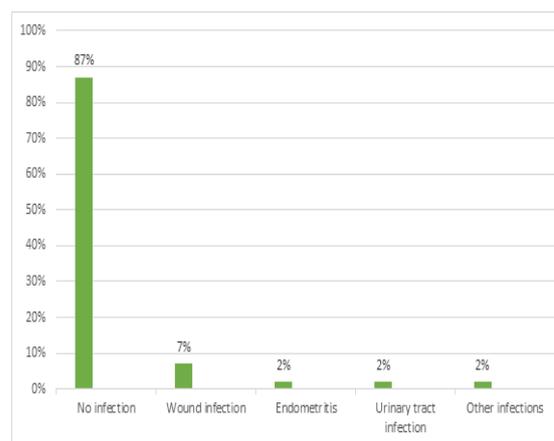


Figure 6: outcome percentage in terms of infection or no infection

DISCUSSION

In the present study a total of 648 patients were encountered within the time frame who had caesarean section. Only 364 patients complied with the inclusion and exclusion criteria determined for this study reflecting a huge proportion of patient suffering from comorbid conditions.

Almost 50% of the sample size was of the age group of 26 - 30 years followed by 18-25yrs and 31-35yrs probably due to demographic and sociocultural status of the patients to complete their school and complete their families. Only 1% were of 40yrs and above. A similar preponderance of age group were seen in a study conducted in China.^[3]

The primigravida represented a greater proportion of 76% of the total sample size than the multigravida which was alike to similar study.^[3]

Since this institution caters mainly the rural population so a lot of referral cases from the primary health centres are met resulting in a substantial number of emergency caesarean section. This reflected in the present study where 58% were emergency and the rest elective.

Few selected class of antimicrobials are used among which the combination of ceftriaxone, metronidazole and amikacin were the most extensively used antimicrobials in 52%. A consolidated approach against gram positive, gram negative and anaerobes is the basis of it liberal use.^[5] 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.^[7] WHO has also recommended the use of beta lactams over other antimicrobials in caesarean section. All the antimicrobials starting from beta lactam, flouroquinolones, nitroimidazole group and aminoglycosides are all hospital supplied and combination drugs are preferred more. With the use of this particular combination of ceftriaxone, amikacin and metronidazole the average duration of parenteral therapy was 2 days which was less than the other antimicrobials.

Ceftriaxone or amoxy-clavulanic acid combination with metronidazole were next most commonly used. Cefuroxime was the most commonly prescribed oral antimicrobial in our study followed by co-amoxyclav with metronidazole combination. A systemic review in Cochrane database of 25 randomised controlled trial inferred from the available evidence that cephalosporins and penicillins have similar efficacy when immediate postoperative infections are taken into consideration.^[7] The overall duration of treatment was 7 days for all antimicrobials used.

Prophylaxis with antimicrobials is standard treatment approach to combat neonatal sepsis and post-operative infections in mother. 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.^[8] Such adherence was noticed in this study which was reflected by 87% patients having uneventful post-operative recovery with no infections. Wound infection was found only in 7% of patients due to unawareness of the patients regarding hygiene. 100% Adherence to prophylactic use of antimicrobials in caesarean section in this institution is a good gesture from the part of treating gynaecologist to tackle post-operative infections. This resulted in reduced morbidity and thus cutting down the hospital expenses.^[4,6]

Apart from appropriate prophylactic antibiotics, proper skin preparation, limiting vaginal exams, practicing sterile technique and limiting hospital stay are paramount factors responsible in decreasing infection risk.^[9]

CONCLUSION

Appropriate dose with proper duration of antimicrobial therapy in both elective and emergency Caesarean Section reduces the infective complication of mother and the new born. The present study showed the commonest antimicrobial use is a combination of ceftriaxone, metronidazole and amikacin. The post-operative infection was merely 11% whereas 87% cases had no infection.

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