

Original article:

Evaluation of Efficacy of Two Different Antibiotic Prophylaxis in Subjects Undergoing Caesarean Section At a Tertiary Care Teaching Hospital: A Comparative Study

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Abstract

Background: The cesarean section (CS) rate has continued to rise in most developed countries. Antibiotic prophylaxis for women undergoing cesarean delivery (CD) has been proven to be beneficial in decreasing post-CD infectious morbidity both in high-risk, or low-risk patients. Under the light of above mentioned data, present study was planned to assess and compare the efficacy of two different antibiotic prophylaxis in subjects undergoing C section.

Materials & Methods: Present study was conducted to evaluate and compare efficacy of Amoxicillin-clavulanic acid (ACA) and cefazolin in subjects undergoing Caesarean section. A total of 20 patients who were scheduled to undergo CS were included in the present study. All the subjects were broadly divided into two study groups based on the type of antibiotic regime as follows: Group 1: Included subjects who were given ACA (2.4g), Group 2: Included subjects who were given cefazolin (2g). All the medications of the respective study groups were administered at the time of induction of anaesthesia. Fever and infection were the two major outcome measured in the present study. All the results were analyzed by SPSS software.

Results: Mean blood loss in subjects of group 1 and group 2 was found to be 523.1 and 501.4 ml respectively. Non-significant results were obtained while comparing the mean duration of procedure and mean blood loss among subjects of both the study groups. We also didn't observe any significant difference while comparing the incidence of postoperative infections among subjects of both the study groups.

Conclusion: In terms of efficacy, both the antibiotic therapies were equally effective in subjects undergoing CS.

Key words: Antibiotic, Caesarean Section.

INTRODUCTION

The caesarean section (CS) rate has continued to rise in most developed countries, but contributing factors remain unclear. One reason suggested in several contexts is that increasing numbers of women are requesting to have an elective cesarean section in the absence of clinical indications.^{1,2} Indeed, some commentators have suggested this is a major factor in driving rising cesarean section rates. Although available evidence suggests that few women want a cesarean section in the absence of any clinical reason, several recent articles have called for a trial of routine cesarean section versus vaginal birth in low-risk women.^{3,4}

Antibiotic prophylaxis for women undergoing cesarean delivery (CD) has been proven to be beneficial in decreasing post-CD infectious morbidity both in high-risk, or low-risk patients,. A single dose of antibiotics is

as effective as multiple doses given peri-operatively, and the routine use of prophylactic antibiotics reduces the risk of infection by more than 50% from a baseline as high as 20-50%.⁵⁻⁷

Under the light of above mentioned data, present study was planned to assess and compare the efficacy of two different antibiotic prophylaxis in subjects undergoing CS.

MATERIALS & METHODS

Present study was conducted in the Department of Obstetrics and Gynaecology, TeerthankerMahaveer Medical College & Research Centre, Moradabad, UP(India) and it included evaluation and comparison of efficacy of Amoxicillin-clavulanic acid (ACA) and cefazolin in subjects undergoing Cesarean section. Written consent was obtained after explaining in detail the entire research protocol.

Inclusion criteria for the present study included:

- Subjects between the age group of 20 to 30 years,
- Subjects who were scheduled to undergo elective CS,
- Subjects who gave informed consent

Exclusion criteria for the present study included:

- Subjects who were allergic to penicillin or cephalosporin
- Subjects who have received any form of previous antibiotic therapy in the past two weeks

Complete demographic and clinical details of all the subjects were obtained. A total of 20 patients who were scheduled to undergo CS were included in the present study. All the subjects were broadly divided into two study groups based on the type of antibiotic regime as follows:

- Group 1: Included subjects who were given ACA (2.4g),
- Group 2: Included subjects who were given cefazolin (2g).

All the medications of the respective study groups were administered at the time of induction of anaesthesia. In all the subjects, the antibiotic was administered immediately after clamping the umbilical cord. Certified and experienced gynecologists performed the CS. After the procedure, all the subjects were examined for any post-treatment complication. Fever and infection were the two major outcome measured in the present study. Clinical symptoms and signs and laboratory tests were used for diagnosing infections. The infections included abdominal wound infection, pelvic cellulitis, vaginal cuff infection, or urinary tract infection. All the results were analyzed by SPSS software. Student t test and chi-square test were used for assessment of level of significance. P-value of less than 0.05 was taken as significant.

RESULTS

A total of 20 subjects were included in the present study. All the subjects were broadly divided into two study groups, with 10 subjects in each group, based on type of antibiotic prophylaxis used. Mean age of the subjects of group 1 and group 2 was 27.5 years and 28.4 years respectively. Mean BMI of the subjects of group 1 and group 2 was 25.4 and 26.1 Kg/m² respectively. Mean blood loss in subjects of group 1 and group 2 was found to be 523.1 and 501.4 ml respectively. Non- significant results were obtained while comparing the mean duration of procedure and mean blood loss among subjects of both the study groups. We also didn't observe any significant difference while comparing the incidence of postoperative infections among subjects of both the study groups.

DISCUSSION

In the present study, non-significant results were observed while comparing the mean duration of procedure and mean blood loss among subjects of both the study groups. Also, didn't observed any significant difference while comparing the incidence of postoperative infections among subjects of both the study groups. Pedersen TK et al investigated the guidelines for patient selection and drug regimens for application of antibiotic prophylaxis in relation to cesarean section in the maternity clinics in Denmark. A questionnaire to all the Danish maternity clinics that perform cesarean section, concerning indications for application of antibiotic prophylaxis and antibiotic regimens to patients undergoing acute and elective cesarean section was prepared. All departments (n = 48) returned the questionnaire. Twenty departments (46%) provided written guidelines for antibiotic prophylaxis. Four departments (8%) used antibiotic prophylaxis to elective cesarean sections, 25 departments (52%) applied antibiotics to all emergency sections. In the presence of the rupture of membranes or prolongation of labor (> 12 hrs) 58% and 63% of the departments applied antibiotic prophylaxis, respectively. The most infrequent first choice drug was cefuroxim, employed by 27 departments (56%). Concerning timing, 21 departments (44%) applied antibiotics after cord clamping and 13 departments (27%) before incision. They propose a nation-wide prospective investigation on the rate of infections associated with cesarean section to set up rational guidelines for antibiotic prophylaxis.⁸

Heineck I et al described the pattern of prescribing antibiotic prophylaxis for cesarean section in a teaching hospital in Brazil. The use of antibiotic prophylaxis in cesarean section was evaluated in a reference school hospital. Data were collected from medical records, and they correspond to the 9-month observation during 1995 and 1996. The cesarean section rate was 26.4% in this period. The total procedures observed were 587. Antibiotic prophylaxis was prescribed in 358 procedures (61%). Cephalothin was the most prescribed drug (98.6%), with a regimen of 2 g intravenously after clamping of the umbilical cord and 2 more doses of 1g every 6 hours. Antibiotic prophylaxis was indicated more frequently in patients younger than 30 years and in those with rupture of membranes for more than 6 hours; such differences were significant. The prescribers met the hospital guidelines for antibiotic prophylaxis in only 37.1% of the cesarean sections performed.⁹ Eriksen HM et al investigated the antibiotics prophylaxis pattern in connection with caesarean section at Norwegian maternity departments. All head senior consultants at maternity departments that carried out more than one caesarean section in 2008 were invited to take part in a survey of the department's written guidelines for use of antibiotic prophylaxis in connection with caesarean section. The extent to which the guidelines were followed was evaluated using data from the Norwegian Surveillance System for Hospital-Associated Infections (NOIS). 38 of the 42 maternity wards in the investigation had written guidelines for antibiotic prophylaxis. Four of these maternity wards gave prophylaxis in all Caesarean sections, one only on indication, and 33 in acute Caesarean section. The guidelines varied as regards choice of type of antibiotic and time of administration. In the maternity wards with written guidelines recommending use of antibiotic prophylaxis in all Caesarean sections, were practice in accordance with the guidelines. When the guidelines recommended prophylactic use only in acute operations, there was agreement between practice and guidelines in 71 % to 97 % of the patients in the ward. Most Norwegian maternity wards have written guidelines on antibiotic prophylaxis in Caesarean section.¹⁰ Hager WD et al compared a narrow-spectrum cephalosporin (cefazolin; n = 63) with an expanded-spectrum cephamycin (cefoxitin; n = 66) and with a broad-spectrum cephalosporin (cefotaxime; n = 60) used as a single-dose prophylaxis in patients undergoing a nonelective cesarean section. Of the 194 patients enrolled in the

study, 189 were evaluable. There was no significant difference between the groups in mean age, gravidity, parity, duration of labor, duration of ruptured membranes, number of vaginal examinations, or socioeconomic status (socioeconomic status was defined by third-party coverage). There was no significant difference among the antibiotics in the incidence of immediate or delayed postoperative infections. These data indicate that a less expensive, narrow-spectrum cephalosporin is as effective as more expensive, broader-spectrum cephamycins and cephalosporins as prophylaxis for patients undergoing nonelective cesarean section.¹¹

CONCLUSION

From the above results, it can be concluded that in terms of efficacy, both the antibiotic therapies were equally effective in subjects undergoing CS. However; future studies are recommended for better exploration of results.

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Table 1: Demographic and clinical details of the subjects of the present study

Parameter	Group 1	Group 2	P- value
Number of subjects	10	10	-
Mean age (years)	27.5	28.4	0.95
BMI (Kg/m ²)	25.4	26.1	0.54

BMI: Body mass index

Table 2: Risk factors for development of postoperative complications

Risk factors	Group 1	Group 2	P- value
Mean duration of procedure (Minute)	46.2	45.1	0.85
Mean blood loss (ml)	523.1	501.4	0.55

Table 3: Comparison of incidence of postoperative infection

Parameter	Group 1 (N)	Group 2 (N)	P- value
Wound infection	1	1	0.52
Endometritis	1	2	
Asymptomatic bacteriuria	2	1	
Total infections	4	4	

Graph 1: Incidence of postoperative infection

