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Comparison Of Length Of Antibiotic Regimens For Prophylaxis In Patients Undergoing Cesarean Section

Sabahat Ali[1], Rakhshanda Aslam[2], Faheema Rasul[3], Hummaira Nasim[4], Noreen Tahir[5], Ammarah Nadeem[6]

1. Registrar, PAF Hospital, Islamabad 2. Assistant Professor, Fazaia Medical College, Islamabad 3. Senior Registrar, Khawaja M. Safdar Medical College, Sialkot 4. Senior Registrar, Specialist care hospital 5. Assistant Professor, Al-Nafees Medical College 6. Assistant Professor, HBS Medical College, Islamabad.

Corresponding author: Dr. Rakhshanda Aslam, drrakhshi26@gmail.com.

Abstract

Objective: To determine the efficacy of a short-term course of prophylactic antibiotic therapy versus a long-term prophylactic antibiotic course in terms of frequency of surgical site infections and mean length of hospital stay in patients undergoing cesarean section.

Methods: This study was conducted in the obstetrics and gynae dept. of PAF Hospital Islamabad, from April 20th to Oct. 2023 i.e. for 6 months. It was a randomised control trial. The height and weight of all patients were recorded and divided into 2 groups via lottery method. Group A (70) received a short-term course of antibiotic therapy while Group B(70) received a long-term course, follow up of both groups was done after 1 month via outpatient Dept. (OPD) on emergency visits or via telephone.

Results: Our study showed that In Group A 6(7%) patients had surgical site infection (SSI) while In Group B 7(10%) patients had SSI. The Mean hospital stay in group A was 2 ± 1.10 while the Mean hospital stay in group B was 4 ± 1.67.

Conclusion: Our study concludes that a short course of prophylactic antibiotic therapy is similar to the long-term prophylactic antibiotics course in terms of reduction in surgical site infection and length of hospital stay in patients undergoing cesarean section.

Keywords: Short-term and long-term, antibiotics are used, and the cesarean section is used.

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Introduction

Caesarean sections are an operative technique wherein a fetus is evacuated from the uterine cavity via a surgical entry through abdominal and uterine walls.[1,2] It is considered a safe procedure, which has increased its usage, making it the most frequently performed obstetric surgery, even when it is not indicated.[1,2] Some studies report that caesarean sections are performed in as many as 24% of all pregnant women, however, the frequency varies across regions but the World Health Organization (WHO) states that cesarean section procedure is performed in anywhere between 10% to 15% of all live births in the west.[1,2] Pakistan is no exception to this epidemic of obstetric surgeries, and it is estimated that approximately 31% to 64% of all live deliveries are performed via caesarean section, of which approximately 58% are emergency procedures.[3]

As with all surgeries, lower segment caesarean section is also associated with adverse outcomes, and it is estimated that they are associated with a threat of a four-fold rise in maternal and neonatal morbidity and mortality.[4] In developing countries, the risk of maternal mortality with caesarean section is estimated at 7.6 per 1000 procedures.[5] The principal factors responsible for these adverse outcomes include surgical site infections which result in prolonged hospital stays and great efforts are made to reduce the incidence of this important complication, including using different antibiotics, diverse combinations of antibiotics and variability in the duration of antibiotic treatment.[6,7]

Adajiet al reported that the incidence of surgical site infection observed was very little: 1.3% with the short-term treatment versus 3.3% with long-term treatment. The short-term treatment had a shorter duration of in-hospital stay of 2.9 ± 1.0 days versus 3.8 ± 1.1 days with the long-term treatment, including re-admissions.[8] Ezeike et al also reported that there was no difference between the two treatments with regards to the occurrence of surgical site infections;12.2% with short-term treatment versus 12.8% with longer duration of treatment,[9] while Mohammed et al noted that while there was some difference between the two treatment methods with regards to the occurrence of surgical site infection: 6.4% versus 10.5% for short- and long-term treatment, respectively and, additionally, there was also no difference in the duration of hospital stay, with a mean duration of 129.7 hours with a short course versus 134.2 hours with a long one.[10]

Caesarean sections are a commonly performed obstetric procedure, the use of antibiotics and hospital occupancy of beds represent a significant financial burden. Measures to reduce this load include reducing the duration and number of antibiotics used for prophylaxis as well as attempting early discharges. However, these measures must not come at the cost of the patient's health. Studies conducted on the subject show variability in outcome and it remains to be determined whether a short-term course of antibiotics is equally efficacious and results in shorter in-hospital stays as compared to long-term therapy. This study will help to determine which treatment is more efficacious. To establish best practices; the results can be used to establish local guidelines and serve as a foundation for future research.

Materials And Methods

It was a randomized control Study in the Dept. of Obstetrics& Gynecology of PAF Hospital Islamabad. The duration of the study was 6 months that is from April 2022- Oct 2022.

The study was conducted after the approval of the hospital's ethical committee and after obtaining informed written consent from the females included in the study. The sample size was 140. Non-probability consecutive sampling technique was used. Inclusion criteria: All patients aged between 18-45 years, gestational age of more than or equal to 37 hrs. and those who indicate elective section. Patients who were already febrile, who took antibiotics within the past 1 week or those who are suffering from an iron deficiency state are excluded from the study.

The participants were enrolled after a thorough clinical history to make sure that they fulfilled the requirements of the selection criteria. Patients were divided into two groups via the lottery method. Group A had received a short-term course of antibiotic therapy, while those in Group B had received the long-term course, both as per operational definitions. Patients underwent a caesarean section completed by a consultant gynaecologist. Patients were followed-up for 01month, via out-patient department or emergency visits, or telephone if required.

Patient data was collected using Proforma. Participants were documented for age, body mass index, parity, indication for caesarean section, and total hospital stay over one month, development of surgical site infection. All information was collected by the primary investigator (PI) to reduce selection bias and improve data coherence.

SPSS Version 26 was used for data analysis. Descriptive statistics was calculated for all variables. Data was presented in tabulated form. Quantitative variables especially age, body mass index, parity, height, weight and total hospital stay over one month were measured by mean and standard deviation. Qualitative variables specifically indication for caesarean section, and development of surgical site infection were measured as frequency and percentage. Effect modifiers specifically age, parity body mass index and indication for caesarean section were controlled by stratification. The chi-square test was applied to check for the association for all qualitative variables between the groups while the independent sample test was applied for the comparison of quantitative variables between the groups and a p-value ≤ 0.05 was considered significant.

Results

Our study shows that in Group A 45(64%) patients were in the age range 18-30 years and 25(36%) in the age range 31-45 years while in Group B 43(61%) patients were in the age range 18-30 years and 27(39%) in the age range 31-45 years. In Group A 40(57%) patients had BMI ≤27Kg/m2 and 30(43%) patients had had BMI >27Kg/m2 while in Group B 42(60%) patients had BMI ≤27Kg/m2 and 28(40%) patients had had BMI >27Kg/m2.In Group A 35(50%) patients were primigravida and 35(50%) patients were multiparous while in Group B 32(46%) patients were primigravida and 38(54%) patients were multiparous. In Group A 56(80%) patients had previous scars. while in Group B 58(83%) patients had previous scars.

Table 1: P value of all the variables(n=140)

Age(Groups)	Group A	Group B	Total	P Value
18-30 Years	45(64%)	43(61%)	88(63%)	
31-45 Years	25(36%)	27(39%)	52(37%)	
Total	70(100%)	70(100%)	140(100%)	
Mean And Sd	28 ± 5.21	29 ± 4.15		0.211
Bmi	Group A	Group B	Total	P Value
≤ 27 Kg/M2	40(57%)	42(60%)	82(59%)	
> 27 Kg/M2	30(43%)	28(40%)	58(41%)	
Total	70(100%)	70(100%)	140(100%)	
Mean And Sd	27±2.91	28±2.88		0.042
Parity	**Group A**	**Group B**	**Total**	**P Value**
Primi Para	35(50%)	32(46%)	67(48%)	0.611
Multi Para	35(50%)	38(54%)	73(52%)	
Total	70(100%)	70(100%)	140(100%)	
Indications	**Group A**	**Group B**	**Total**	**P Value**
Previous Scars	56(80%)	58(83%)	114(82%)	0.903
Suspected Fetal Compromise	5(7%)	4(5%)	9(6%)	
Malpresentation	9(13%)	8(12%)	17(12%)	
Total	70(100%)	70(100%)	140(100%)	
Ssi	Group A	Group B	Total	P Value
Yes	3(4%)	7(10%)	10(7%)	0.189
No	67(96%)	63(90%)	130(93%)	
Total	70(100%)	70(100%)	140(00%)	
Hospital Stay	**Group A (N=70)**	**Group B (N=70)**	**P Value**	
Mean And Sd	2 ± 1.10	4 ± 1.67	0.0001	

Discussion

Our study showed that in Group A 45(64%) patients were in the age range 18-30 years and 25(36%), were in the age range 31-45 years while in Group B 43(61%) patients were in the age range 18-30 years and 27(39%) in the age range 31-45 years. In Group A 40(57%) patients had BMI ≤27Kg/m^2 and 30(43%) patients had had BMI >27Kg/m^2 while in Group B 42(60%) patients had BMI ≤27Kg/m^2 and 28(40%) patients had had BMI >27Kg/m^2. In Group A 35(50%) patients were primiparous and 35(50%) patients were multiparous while in Group B 32(46%) patients were primiparous and 38(54%) patients were multiparous. In Group A 3(4%) patients had SSI while 67(96%) patients didn't have SSI. In Group B 7(10%) patients had SSI while 63(90%) patients didn't have SSI. The mean hospital stay in group A was 2 ± 1.10 while the Mean hospital stay in group B was 4 ± 1.67.

Similar results were observed in another study carried out by Adajiet et al,[11] in which there was no significant statistical difference found in the rate of wound infection among the 2 groups (1.3% vs. 3.3%, P = 0.136). Escherichia coli was the most common isolate seen in 36.4% of the infected wounds. The incidence of endometritis was 2.1%, which was not statistically significant(0.4% vs. 1.6%, P = 0.213). As far as hospital stay is concerned, the short-arm group stayed for significantly fewer days in the hospital (2.9 ± 1.0 vs. 3.8 ± 1.1 days < 0.001), Cost of antibiotics was also significantly less in the short-arm group (P < 0.001). The patients in the long arm had a higher incidence of organisms associated with nosocomial infections.

Similar results were observed in another study carried out by Ezeike et al,[12] in which there was no difference between the two treatments with regards to the occurrence of surgical site infections;12.2% with short-term treatment versus 12.8% with longer duration of treatment.

Similar results were observed in another study carried out by Mohammed et al.[13] There was no difference in the rate of wound infection and fever as shown by the P value of 0.36 and 0.6 respectively. The mean hospital stay duration in the two-dose regimen was 129.7 hours as compared to the single dose which was 134.2 hours with a non-significant P value of 0.48.

Conclusions

Our study concludes that a short-term course of prophylactic antibiotic therapy is similar to a long-term prophylactic antibiotic course in terms of reduction in surgical site infections and length of hospital stay in patients undergoing cesarean section.

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- Experimentation/Study Conduction
S.A, F.R, N.T - Analysis/Interpretation/Discussion
R.A, H.N, A.N - Manuscript Writing
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