International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Jirange UM et al. Int J Reprod Contracept Obstet Gynecol. 2026 Feb;15(2):570-573
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20260176

Original Research Article

Comparison of prophylactic versus regular use of antibiotics in caesarean section

Umesh Maruti Jirange*, Y. Sneha, P. P. S. Mallika

Department of Obstetrics and Gynecology, MNR Medical College and Hospital, Sangareddy, Telangana, India

Received: 07 March 2025
Revised: 01 July 2025
Accepted: 01 August 2025

***Correspondence:**
Dr. Umesh Maruti Jirange,
E-mail: umesh.jirange@gmail.com

ABSTRACT

Background: Surgical site wound infections and associated complications after caesarean delivery are important causes of maternal morbidity, increased duration of hospital stay and cost of treatment. Prophylactic antibiotic usage decreases the risk of these wound infections. Because of variations in patient profiles and a lack of knowledge regarding asepsis, clinicians are reluctant to implement the recommended single-dose preoperative antibiotic prophylaxis.
Methods: This was a prospective study involving 200 women undergoing caesarean delivery at obstetrics and gynecology department of MNR Medical College and Hospital, Fasalwadi, Sangareddy, tertiary care centre. Eligible participants were divided into two groups. Group A received single dose antibiotic prophylaxis of ceftriaxone 1 gm intravenously 30-40 minutes before caesarean section and group B received cefotaxime 1 gm +sulbactam 500 mg 30-40 minutes before the caesarean, followed by cefotaxime+sulbactam and ornidazole intravenously for the first 3 post-operative days followed by oral cefixime for the next 5 days. Postoperatively, both groups of patients were followed up for febrile morbidity, UTI, wound infection, vaginal infection. These parameters were compared across the two groups.
Results: There were 100 patients in each group. Baseline characteristics, indications for caesarean delivery, operative duration and difficulties were similar. Post-operative morbidities like fever did differ significantly, UTI, wound infection, vaginal infection did not differ significantly. Few of the women needed prolongation of hospital stay.
Conclusions: Preoperative prophylactic antibiotic regimen was as effective as regular antibiotic regimen prophylaxis for routine caesarean delivery. Judicious use of limited antibiotics should be encouraged to decrease antibiotic resistance, with the added benefit of being economical.

Keywords: Antibiotic prophylaxis, Caesarean delivery, Infectious complications, Single drug, Surgical site infection

INTRODUCTION

Caesarean section is defined as birth of a fetus through a surgically created incision in the anterior abdominal wall and intact uterine wall after 28 weeks period of gestation. Caesarean section is a major risk for postpartum infection with possible 5-to-20-fold increase in infection compared with vaginal delivery.[1] These infectious complications are an important cause of maternal mortality and morbidity.[2] Factors associated with increased risk of infection in women undergoing caesarean delivery include emergency caesarean section, labour and its duration, ruptured membranes and duration of rupture, use of prophylactic antibiotics or not, socioeconomic status of women, no of prenatal visits, vaginal examinations during labour, anaemia, blood loss, obesity, diabetes, general anaesthesia, skill of operator and operative techniques.[3] The source of wound infection and genital tract infection after caesarean section are primarily from the patients abdominal skin introduced during or after the incision and bacteria ascending from vagina before or after the operation, infection could be due to cross infection.[4] After caesarean section maternal mortality and morbidity may occur from a number of infections which includes fever (febrile morbidity), wound infection, urinary tract infection, endometritis, pelvic abscess, septic pelvic vein

thrombophlebitis, sepsis and septic shock.[5] The overall aim of prophylactic antibiotics use in surgery is intended to prevent morbidity and mortality as well as to reduce duration and cost of hospitalisation. The present study was done to evaluate the effectiveness of prophylactic antibiotic in reducing duration and cost of hospitalisation.

METHODS

This prospective study was conducted in the department of obstetrics and gynecology at MNR medical college and hospital, Sangareddy over a period of 12 months from December 2022 to November 2023. 200 patients were selected after considering the inclusion and exclusion criteria. Data analysis was performed using Microsoft Excel, continuous data were compared using unpaired t test and categorical data using chi square test. For all statistical purposes, p value of <0.05 was considered statistically significant.

Inclusion criteria

Booked case at MNR hospital with regular antenatal visits. Mothers without any pre-existing medical illness. Women undergoing elective and emergency clean caesarean section (not in labour for >6 hours). Written, informed consent.

Exclusion criteria

Hypersensitivity to any of my trial drugs. Pre-existing infections. First visit to MNR hospital without any previous records. Concomitant systemic disease such as uncontrolled diabetes, hypertension, renal or hepatic disease. Patients on pre-treatment with other antibiotics (within previous 2 weeks). Premature rupture of membranes >12 hours. Meconium-stained liquor, IUD. Associated medical complications. Operative period lasting >3 hours.

Methodology

After institutional ethical committee approval, this study was conducted in department of obstetrics and gynecology at MNR medical college and hospital, Sangareddy. After a careful history taking and detailed examination to rule out any pre-existing illness, infection or risk factors for infection, blood investigations, patients were selected for the study. The aim of the study was explained to the patients and informed consent was obtained from patients fulfilling inclusion criteria. Patients who were not willing to participate in the study were excluded. They were divided randomly into two groups: Group 1: consisted of 100 cases. Women in group 1 received single dose antibiotic prophylaxis with injection ceftriaxone 1 gram (gm) given intravenously 30-40 minutes before the surgery. Group 2: consisted of 100 cases. Women in group 2 received injection cefotaxime 1 gm + sulbactam 500 milligram (mg) intravenously 30-40 minutes before the caesarean section, followed by injection cefotaxime 1 gm + sulbactam 500 mg and ornidazole 500 mg intravenously twice a day for the first 3 post-operative days followed by oral cefixime 200 mg twice a day for the next 5 days.

Intra operative methods used by different surgeons were noted. Suture material and technique of closure of the abdomen was documented. Both the group patients were informed about the signs and symptoms of wound infection, uterine infections, urinary infection, vaginal infections such as redness, swelling, discharge, pain, raised temperature at wound site, increased frequency of micturition or burning micturition, uterine tenderness and foul-smelling lochia, fever (temperature more than 38 degree Celsius recorded on two separate occasions 4 hours apart), chills, erythema. Need for additional antibiotics and duration of hospital stay are noted. Duration of use of intravenous cannula was noted. The following were recorded: Vital signs and temperature twice daily and abdominal examination once daily to note the size of the uterus and presence of tenderness. The wound was inspected on the 4th and 7th postoperative day. Blood culture and sensitivity were done routinely for all patients on 2nd and 5th day and results were meticulously compared and interpreted.

RESULTS

Among group 1 patients, mean age was 26.2 years, median parity was 1, mean BMI was 27.5 kg/m^2, and 55 patients had elective caesarean. Among group 2 patients, mean age was 26.8 years, median parity was 1, mean BMI was 28.1 kg/m^2, and 52 patients had elective caesarean. All parameters showed no statistically significant differences between groups (p>0.05).

Table 1: Baseline demographics in both the groups.

Characteristic	Group 1 (n=100)	Group 2 (n=100)	P value
Age (years, mean)	26.2	26.8	0.45
Parity (median)	1	1	0.72
BMI (kg/m^2, mean)	27.5	28.1	0.38
Elective CS (%)	55	52	0.68

Among the patients of group 1, 94% had no fever and 6% developed fever. Among the patients of group 2, 80 % had no fever and 20% developed fever. The difference in both the groups in term of fever was statistically significant at p=0.003.

Table 2: Incidence of fever in both the groups.

Fever	Group 1	%	Group 2	%	Grand total
No	94	94	80	80	174
Yes	6	6	20	20	26
Grand total	100	100	100	100	200

Table 3: Incidence of urinary tract infection in both the groups.

UTI	Group 1	%	Group 2	%	Grand total
No	96	96	92	92	188
Yes	4	4	8	8	12
Grand total	100	100	100	100	200

Among the patients of group 1, 96% had no UTI and 4% developed UTI. Among the patients of group 2, 92% had no UTI and 8% developed UTI. The difference in both the groups in terms of UTI was not statistically significant at p=0.3.

Table 4: Incidence of wound infection in both the groups.

Wound infection	Group 1	%	Group 2	%	Grand total
No	95	95	92	92	169
Yes	5	5	8	8	31
Grand total	100	100	100	100	200

Among the patients of group 1, 95% had no wound infection and 5% developed wound infection. Among the patients of group 2, 92% had no wound infection and 8% developed wound infection. The difference in both the groups in terms of wound infection was not statistically significant at p=0.2.

Table 5: Incidence of vaginal infection in both the groups.

Vaginal infection	Group 1	%	Group 2	%	Grand total
No	97	97	90	90	187
Yes	3	3	10	10	13
Grand total	100	100	100	100	200

Among the patients of group 1, 97% had no vaginal infection and 3% developed vaginal infection. Among the patients of group 2, 90% had no vaginal infection and 10% developed vaginal infection. The difference in both the groups in terms of vaginal infection is not statistically significant at p=0.4.

DISCUSSION

The administration of pre-induction antibiotics before lower segment cesarean section (LSCS) is a critical intervention in obstetric care aimed at minimizing the risk of postoperative infections.

Administering antibiotics before the incision, typically within 60 minutes prior to surgery, ensures optimal tissue concentration of the antibiotic at the time of potential bacterial contamination. This timing is crucial because it maximizes the prophylactic effectiveness of the antibiotics, thereby lowering the incidence of SSIs and other postoperative infections. The post-op fever among prophylactic antibiotic group (6%) in our study is comparable to the post-op fever among prophylactic antibiotic group in Kristenesen et al study (2%) and Bagratee et al study (8.3%).[6,7] The post-op fever among regular antibiotic group (20%) in my study was comparable to the post-op fever among regular antibiotic group in Kristenesen et al study (19.2%) and Bagratee et al study (7.9%).[6,7] The post-op UTI among prophylactic antibiotic group (6%) in my study is comparable to the post-op UTI among prophylactic antibiotic group in Batra et al study (4%) and Swamy et al study (2%).[8,9] The post-op UTI among regular antibiotic group (8%) in my study is comparable to the post-op UTI among regular antibiotic group in Batra et al study (8%) and Swamy et al study (12%).[8,9] The post-op wound infection among prophylactic antibiotic group (5%) in my study is comparable to the post-op wound infection among prophylactic antibiotic group in Huam et al study (3%) and Nehad et al study (6%).[10,11] The post-op wound infection among regular antibiotic group (8%) in my study is comparable to the post-op wound infection among regular antibiotic group in Huam et al study (13%) and Nehad et al study (9%).[10,11] The post-op vaginal infection among prophylactic antibiotic group (3%) in my study is comparable to the post-op vaginal infection among prophylactic antibiotic group in Igwemadu et al study (0%) and Krishna et al study (1%).[6,12] The post-op vaginal infection among regular antibiotic group (10%) in my study is comparable to the post-op vaginal infection among regular antibiotic group in Igwemadu et al study (6%) and Krishna et al study (0%).[6,12]

CONCLUSION

Single-dose prophylactic antibiotics (ceftriaxone) were as effective as multi-day regimens in preventing post-caesarean infections (fever p=0.003 significant; others non-significant), with lower resistance risk and cost. This advances obstetric care by supporting judicious antibiotic use in resource-limited settings, reducing morbidity without compromising efficacy.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Daniel CN, Singh S. Cesarean delivery: an experience from a tertiary institution in north western Nigeria. Niger J Clin Pract. 2016;19(1):18-24.
2. Hema KR. Cesarean section. In: Decherney AH, Nathan LN, Lauper N, eds. Current diagnosis and

treatment: obstetrics and gynecology. Vol. 20. 11th edn. New York: McGraw Hill; 2013:356-378.
3. Westen EH, Kolk PR, van Velzen CL, Unkels R, Mmuni NS, Hamisi AD, et al. Single-dose compared with multiple day antibiotic prophylaxis for cesarean section in low-resource settings, a randomized controlled, noninferiority trial. Acta Obstet Gynecol Scand. 2015;94:43-9.
4. Schulze G. Prophylactic antibiotics in cesarean section. Zentral blatt Für Gynäkol. 1980;102(12):659-63.
5. Rouzi AA, Khalifa F, Ba'aqeel H. The routine use of cefazoline in cesarean section. Int J Obst Gynecol. 2000;69:107-12.
6. Kristensen GB, Beiter EC, Mather O. Single dose antibiotic prophylaxis is non elective cesarean section. Acta Obstet Gynecol Scand. 1990;69(6):497-500.
7. Bagratee JS, Moodley J, Kleinschmidt I, Zawilski W. A randomized trial of antibiotic prophylaxis in elective cesarean delivery BJOJ. 2001;108(2):143-8.
8. Batra S, Anjali T, Nari S. Poonam. Prophylactic antibiotics in Gynae Major surgery. J Obstet Gynecol India. 1994;44(3).
9. Swamy MK, Nivadita AK. Comparative study of short term versus long term prophylaxis in obstetrics and Gynaec major surgery. J Obstet Gynecol India. 1999;49(1).
10. Huam SH, Lim JM, Raman S. Single dose antibiotic prophylaxis in women undergoing elective cesarean section. Med J Malaysia. 1997;52(1):3-7.
11. Ahmed NJ, Haseeb A, AlQarni A, AlGethamy M, Mahrous AJ, Alshehri AM, et al. Antibiotics for preventing infection at the surgical site: single dose vs. multiple doses. Saudi Pharm J. 2023;31(12):101800.
12. Igwemadu GT, Eleje GU, Eno EE, Akunaeziri UA, Afolabi FA, Alao AI, et al. Single-dose versus multiple-dose antibiotics prophylaxis for preventing cesarean section postpartum infections: a randomized controlled trial. Women's Health. 2022;18:17455057221101071.

Cite this article as: Jirange UM, Sneha Y, Mallika PPS. Comparison of prophylactic versus regular use of antibiotics in cesarean section. Int J Reprod Contracept Obstet Gynecol 2026;15:570-3.