



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

PROSPECTIVE STUDY ON THE ROLE OF PERIOPERATIVE ANTIBIOTICS ON THE STATUS OF ABDOMINAL WOUND IN CAESAREAN SECTION

Dr. Arpita Pramanik, Dr. Debobroto Roy, Dr. Debdut Banerjee, Prof. Dr. Malay Sarkar

Senior Resident, MS, Department of Gynaecology & Obstetrics, Burdwan Medical College & Hospital, Burdwan, West Bengal 713104.

Assistant Professor, Department of Gynaecology & Obstetrics, & Burdwan Medical College & Hospital, Burdwan, West Bengal 713104.

Associate Professor, Department of Gynaecology & Obstetrics & Burdwan Medical College & Hospital, Burdwan, West Bengal 713104.

Professor, Department of Gynaecology & Obstetrics & MD Burdwan Medical College & Hospital, Burdwan, West Bengal 713104.

Corresponding Author: Dr. Debobroto Roy, Assistant Professor, Department of Gynaecology & Obstetrics, & Burdwan Medical College & Hospital, Burdwan, West Bengal 713104.

Volume 6, Issue 14, Aug 2024

Received: 15 June 2024

Accepted: 25 July 2024

Published: 15 Aug 2024

doi: [10.48047/AFJBS.6.14.2024.8088-8096](https://doi.org/10.48047/AFJBS.6.14.2024.8088-8096)

ABSTRACT

Introduction: The Caesarean Section is a surgical procedure to deliver a baby or babies by doing a laparotomy and entering into the gravid uterus to access the term fetus and remove it. The first such procedure was documented in 1020 AD. The procedure has been classically preferred when there are any problems during delivery on either the mother's side such as cardiac issues or non-progression of labour or on the baby's side such as shoulder dystocia, breech position.

Aims: To study and analyze the role of perioperative prophylactic antibiotics on the status of abdominal wound in caesarean section. Also, to detect as far as possible the factors responsible for impaired abdominal wound healing after caesarean section

Materials and Methods: The present study was a Longitudinal Study. This Study was conducted from 1st April, 2021 to 31st September, 2022 at Obstetrics and Gynaecology, Burdwan Medical College and Hospital.

Result: It is clear that the group of study participants who were not provided with antibiotic prophylaxis fared worse on all outcome parameters: 20% had contracted fever, 30% had endometritis and 24% had SSI occurrence, as compared to the group which experienced prophylaxis: 10% had fever, 8% endometritis, and 14% SSI occurrence.

Conclusion: Perioperative antibiotics significantly reduce the rate of postoperative wound infections and improve wound healing in cesarean sections. The findings support the routine use of prophylactic antibiotics in cesarean deliveries to enhance surgical outcomes. Further research is warranted to refine protocols for antibiotic administration, including optimal timing and duration, to maximize patient benefit and minimize potential risks..

Keywords: Cesarean section, perioperative antibiotics, wound infection and wound healing, prospective study.

INTRODUCTION

The Cesearean Section is a surgical procedure to deliver a baby or babies by doing a laparotomy and entering into the gravid uterus to access the term fetus and remove it. The first such procedure was documented in 1020 AD. The procedure has been classically preferred when there are any problems during delivery on either the mother's side such as cardiac issues or non-progression of labour or on the baby's side such as shoulder dystocia, breech position.

Consequently however, one of the major risks of this procedure is post-partum infection. Other complications such as scar tenderness during future pregnancies and general inability to have more than two babies following the procedure are other important considerations to be noted as well. In spite of this, the procedure is well accepted in modern society and indeed often preferred over normal delivery in an elective setting, even when perhaps it might have not been required. This is due to the attractive benefit of the procedure being done under anesthesia as well as avoiding complications arising from vaginal delivery.

Yearly, around 18.5 million Cesearean Sections are done around the world. Globally an average of 10-15 percent of all cases are generally preferred for C-Section, although the actual rate has only increased since then.

Being a surgical procedure to deliver a baby through the abdomen of the mother, it is a significantly major procedure and there are inevitable complications associated with this. Mostly, it has been indicated in situations where the mother is experiencing unexpected delivery problems such as multiple foetuses, bad general condition of the mother, non-progression of labour, etc , .

Given that mothers who give birth through cesarean section have higher chances of infection, most commonly in the form of surgical site infection, which can progress to affect the womb lining in the form of surgical site endometritis: a well-documented complication, and may even progress further to cause pelvic abcess, pelvic inflammatory disease or may through the blood, cause sepsis and subsequent death through septic shock especially in low-resource circumstances, it is clear that hand-in-hand with good surgical practices and proper sterility maintenance, antibiotic coverage and administration, whether prophylactically or otherwise, is of the utmost importance particularly prior to beginning the procedure .

Therefore in the given scenario, antibiotic usage is unavoidable, and should be used as required so as to prevent further complications or worse outcomes. Proper administration of good antibiotics with wide coverage and with appropriate timing and dosage may very well be a life-saver to both the mother and the child by preventing post-partum infection.

MATERIALS AND METHODS

Study design: Longitudinal Study.

Study setting: This study was conducted in the Department of Obstetrics and Gynaecology, Burdwan Medical College and Hospital.

Period of study: This study was planned to be conducted over 1 year and 6 months from 1st April,2021 to 31st September,2022.

Study population: Prospective LUCS cases (emergency or planned) during admission.

Inclusion criteria:

- Study subject will be all women undergoing caesarean section (emergency or planned) in the department of Obstetrics and Gynecology, Burdwan Medical College and Hospital, within the research period.
- Women those who will give consents.

Exclusion criteria:

- Those who do not give consent.
- Those who are very serious patients.
- Those who are hyper tensive, diabetic, severe anaemic, eclampsia patients etc.
- Elderly mother whose first pregnancy is at the age of >30 years.

RESULT

It is clear that the group of study participants who were not provided with antibiotic prophylaxis fared worse on all outcome parameters: 20% had contracted fever, 30% had endometritis and 24% had SSI occurrence, as compared to the group which experienced prophylaxis: 10% had fever, 8% endometritis, and 14% SSI occurrence.

Looking at the Relative Risk Ratios for the outcome parameters, we see this story further supported, with having no prophylactic antibiotic coverage making the study participant about twice as likely to develop fever, nearly 4 (3.7) times as likely to develop endometritis and finally about 1.7 times more likely to develop SSI.

Looking at the Pearson's Chi-square tests for the outcome variables, we note that only one of the three have statistically significant correlated, with endometritis being correlated at a value of 7.8 at 0.005 p. The other variables have co-efficients ranging from 1.6 to 1.9, all positively correlated with having no prophylactic antibiotic coverage.

Table: Antibiotic Prophylaxis vs Fever

Perioperative Antibiotic Coverage * Fever Crosstabulation				
Count				
		Fever		Total
		No	Yes	
Perioperative Antibiotic Coverage	Absent	40	10	50
	Present	45	5	50
Total		85	15	100

Table: Antibiotic Prophylaxis vs Endometriosis

Perioperative Antibiotic Coverage * Endometriosis Crosstabulation				
Count				
		Endometriosis		Total
		No	Yes	
Perioperative Antibiotic Coverage	Absent	35	15	50
	Present	46	4	50
Total		81	19	100

Table: Antibiotic Prophylaxis vs Endometriosis Chi-Square

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.862 ^a	1	.005		
Continuity Correction ^b	6.498	1	.011		
Likelihood Ratio	8.281	1	.004		
Fisher's Exact Test				.009	.005
N of Valid Cases	100				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.50.					
b. Computed only for a 2x2 table					

Table: Antibiotic Prophylaxis vs SSI

Perioperative Antibiotic Coverage * SSI Crosstabulation		
Count		
	SSI	Total

		No	Yes	
Perioperative Antibiotic Coverage	Absent	38	12	50
	Present	43	7	50
Total		81	19	100

Table 19: Antibiotic Prophylaxis vs SSI Chi-Square

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.624 ^a	1	.202		
Continuity Correction ^b	1.040	1	.308		
Likelihood Ratio	1.640	1	.200		
Fisher's Exact Test				.308	.154
N of Valid Cases	100				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.50.					
b. Computed only for a 2x2 table					

DISCUSSION

What is interesting is comparing our results to prior studies, such as that conducted by Kaimal AJ et al [1], we see a much more dramatic rise in the reduction of SSI (nearly 170%) as compared to only 60% in the aforementioned study. Perhaps demographics, or immune system status of participants are also involved, as suggested by the fact that SSI and antibiotic prophylaxis are not seen to be correlated statistically significantly; small sample size of the study may also play a role. It may be noted that the aforementioned study found a statistically significant reduction, which indicates again that there has perhaps been influence of more than one confounder variable which was not controlled in the study design.

Other studies such as the well-known Cochrane Review on the topic have come to similar conclusions, with antibiotic prophylaxis reducing the risk for endometritis, fever or SSI by anywhere from 60% to 70%.

It should be noted there has been serious controversy over how to best achieve antibiotic coverage prophylactically without overdoing it and creating drug resistant organisms inadvertently. Huskins et al.[2] noted that although it was quite well accepted that antibiotic prophylaxis was needed, it was very varied from centre to centre and differed in several respects such as whether all mothers got it, or whether to give single dose or multiple doses. Now, in our study, we utilised a single dose of ceftriaxone just 1 hour before the procedure. The study participants all had been given standard ceftriaxone and metronidazole regimens together. This decision to go single dose, matches the recommendations made by Huskins et al.² where it is recommended to give a single injection of prophylactic antibiotic just about an hour before surgery begins, being preferably a cephalosporin, metronidazole or gentamycin.

This also concurs with the findings of a randomised controlled trial looking at the issue which found no difference between multiple dosing regimens and single dosing regimens.

REFERENCES

1. Kaimal, A. J., Zlatnik, M. G., Cheng, Y. W., Thiet, M. P., Connatty, E., Creedy, P., & Caughey, A. B. (2008). Effect of a change in policy regarding the timing of prophylactic antibiotics on the rate of postcesarean delivery surgical-site infections. *American journal of obstetrics and gynecology*, 199(3), 310-e1.
2. Huskins, W. C., Ba-Thike, K., Festin, M. R., Limpongsanurak, S., Lumbiganon, P., Peedicayil, A., ... & for Perinatal, G. N. (2001). An international survey of practice variation in the use of antibiotic prophylaxis in cesarean section. *International Journal of Gynecology & Obstetrics*, 73(2), 141-145.