

COMPARATIVE STUDY OF SHORT TERM VS. LONG TERM USE OF PROPHYLACTIC ANTIBIOTICS IN LOWER SEGMENT CAESAREAN SECTION

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ABSTRACT

BACKGROUND

A large number of randomized trials have demonstrated that a single dose of an antimicrobial agent at the time of caesarean section will serve to decrease the infectious morbidity significantly in high risk labouring patients as well as those undergoing caesarean section. In the present prospective study, antibiotic prophylaxis with single dose ceftriaxone 1 gm IV administered after umbilical cord clamping in caesarean section is very safe, cost effective, more convenient and also effective in reducing maternal morbidity and post-operative hospital stay when compared to traditional use of ampicillin/gentamicin in caesarean section.

MATERIAL AND METHODS

Prospective study carried out in the Department of Obstetrics and Gynaecology, Government RSRM lying in hospital and Stanley Medical College Chennai from June 2007 to October 2008 that involved 1000 pregnant women undergone lower segment caesarean section who were divided into two groups randomly after excluding the exclusion criteria.

RESULTS

Single dose ceftriaxone prophylaxis is cost effective, in that the cost of treatment is 4 times less than that of conventional antibiotics, ampicillin/gentamicin. Ceftriaxone prophylaxis safe, effective, convenient and saves man power thus preventing irregularity in administering drugs and can easily replace the 5 days' extended use of antibiotics.

CONCLUSION

In the present study antibiotic prophylaxis with single dose ceftriaxone 1 gm IV administered after umbilical cord clamping in caesarean section is very safe, cost effective, more convenient and also effective in reducing maternal morbidity and post-operative hospital stay when compared to traditional use of ampicillin/gentamicin in caesarean section.

KEYWORDS

Antibiotic Prophylaxis, Lower Segment Caesarean Section, Infections.

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INTRODUCTION

Prophylactic antibiotics in surgery is intended to prevent morbidity and mortality as well as to reduce the duration and the cost of hospitalization.⁽¹⁾ Despite the advent of antibiotic, infection in obstetric practice continue to cause problems, particularly the developing countries. The source of wound infection and genital tract infection after caesarean section is primarily due to organisms from the patient's abdominal skin introduced during or after the incision and bacteria ascending from the vagina before or after the operation.⁽²⁾⁽³⁾⁽⁴⁾ The infection could be due to cross infection. Ceftriaxone is the third generation cephalosporin of choice due to its longer duration of action. It has an action on aerobic gram negative bacteria as well as gram positive bacteria. The present study was carried out to evaluate the efficacy and safety of ceftriaxone in caesarean section.

AIM OF THE STUDY

1. To assess the effectiveness of single dose antibiotic prophylaxis with Inj. Ceftriaxone 1 gm IV after clamping the umbilical cord in controlling infections in caesarean section.
2. To reduce the total requirement of antibiotics in lower segment caesarean section cases to reduce the cost of treatment.
3. To compare the effectiveness of ceftriaxone with ampicillin and gentamicin combination, which is being presently used for 5 days postoperatively.

MATERIALS AND METHODS OF STUDY

This is a prospective study carried out in the Department of Obstetrics and Gynaecology, Government RSRM lying in hospital and Stanley Medical College Chennai from June 2007 to October 2008 that involved 1000 cases undergone lower segment caesarean section who were divided into two groups randomly after excluding the exclusion criteria.

The Exclusion Criteria

1. Hypersensitivity to cephalosporins.
2. Pre-existing infection.
3. Concomitant systemic disease such as uncontrolled diabetes, hypertension, renal or hepatic disease.
4. PROM.
5. Patients on pre-treatment with other antibiotics.

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6. Patients with asthma, anaemia, temperature >38°C, respiratory insufficiency or those having any sort of infection are not included in the study.

Group I consisted of 500 cases who were given Inj. Ceftriaxone 1 gm IV after clamping the umbilical cord during caesarean section.

Group II consisted of 500 cases who received Inj. Ampicillin 500 mg and Inj. Gentamicin 80 mgs which was started 4-6 hrs. after surgery and was given BD for 48 hrs. Followed by oral Amoxicillin 500 mgs 6th hourly for 72 hrs. and Gentamicin 80 mgs. IM BD for 5 days.

The presence of temperature, vaginal infection, urinary tract infection, respiratory tract infection, abdominal wound infection, need for additional antibiotic, febrile morbidity and the period of hospital stay were carefully noted. High vaginal swab and abdominal wound swab were sent for culture and sensitivity and results on each group were meticulously compared.

RESULTS

Total no. of cases taken for Group I: 500

Total no. of cases taken for Group II: 500

AGE GROUP	GROUP I		GROUP II	
	No.	%	No.	%
16-25 yrs.	435	87	422	84.4
26-30 yrs.	57	11.4	67	13.4
31 & above	8	1.6	11	2.2

Table 1: Age Distribution in Lower Segment Caesarean Section Group

PARITY GROUP	GROUP I		GROUP II	
	No.	%	No.	%
PRIMI	232	46.4	243	48.6
MULTI	268	53.6	257	51.4

Table 2

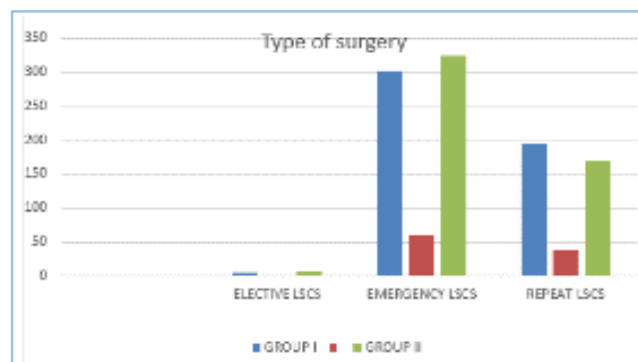


Fig. 1: Type of Surgery

INDICATION	GROUP I		GROUP II	
	No.	%	No.	%
Previous lower segment caesarean section with CPD	197	39.4	166	33.2
Fetal distress	81	16.2	83	16.6
Failed induction	28	5.6	44	8.8
Breech	32	6.4	34	6.8
CPD	53	10.6	54	10.8
Oligohydramnios	24	4.8	17	3.4

Malpresentation	2	0.4	2	0.4
BOH	11	2.2	7	1.4
Others	72	14.4	93	18.6

Table 3: Indications of Lower Segment Caesarean Section

BLOOD LOSS	GROUP I		GROUP II	
	No.	%	No.	%
500-750 ML	300	60	360	72
750-1000 ML	200	40	140	28
>1000 ML	-	-	-	-

Table 4: Blood Loss During Lower Segment Caesarean Section

	GROUP I		GROUP II	
	No.	%	No.	%
Temperature	20	4	51	10.2
Cough	4	0.8	10	2
Vomiting			20	4
Abdominal distension			10	2
Wound infection	9	1.8	41	8.2
UTI	10	2	33	6.6
Adverse reactions			10	2
Abdominal wound resuturing			5	1
Thrombophlebitis				

Table 5: Post-Operative Complications

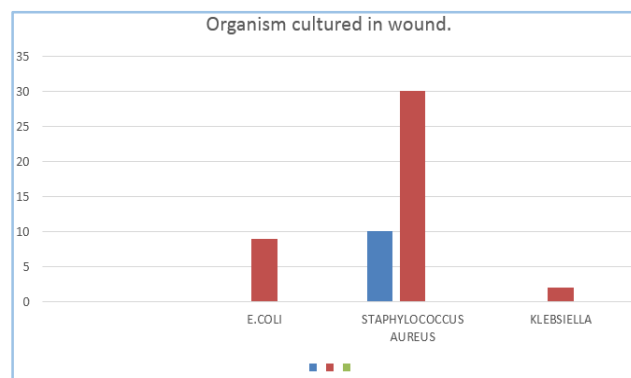


Fig. 2: Wound Infection

ORGANISMS CULTURED	GROUP I	GROUP II
E. coli	10	28
Staphylococcus aureus	-	-
Klebsiella	-	4
Proteus	-	1

Table 6: Urinary Tract Infection

RESULTS	GROUP-I	GROUP-II	P-VALUE
Febrile morbidity	4	10.2	<0.001
Wound infection	1.8	8.2	<0.001
Urinary tract infection	2	6.6	<0.001
Abnormal vaginal discharge	-	2	Not Significant

Table 7: Infectious Morbidity

POST-OP PERIOD	No. of Days of Hospital Stay	
	Group I	Group II
Afebrile patients	9	9
Febrile patients	12	15
Wound infection	14	16
UTI	10	12

Table 8: Postoperative Period

DISCUSSION

The primary aim of prophylactic antibiotics is to reduce the infection and thereby reduce morbidity and mortality.⁽⁴⁾ Antibiotic prophylaxis for caesarean should be perioperative ensuring a high plasma concentration of the antibiotics during lower segment caesarean section.^{(5),(6),(7)} Various recent studies in obstetric cases proved that there is definite role of prophylactic antibiotics.^{(8),(9)} Before the routine use of prophylactic antibiotics for caesarean section, the febrile morbidity and endomyometritis rates were 36% and 32% respectively.⁽¹⁰⁾

	GROUP I {%	GROUP II {%
Kristenson 1990	2	19.2
Saltzman 1985	14	32.7
Itskovitz J 1979	16	30
Huam 1997	8	18
Bagratee 2001	8.3	7.9
Mancuso 1989	8	9.6
Sulovic 1994	12.5	24.2
Study Group	4	10.2

Table 9: Febrile Morbidity

In the present study, febrile morbidity was 4% in Ceftriaxone group when compared to 10.2% in conventional agents in Group II.

	GROUP I	GROUP II
Huam 1997	3	13
Bagratee 2001	12.5	13.3
Mallaret 1990	12.5	26
M. K. Swamy 1998	4	16
Brar et al.	8	28
Study Group	1.8	8.2

Table 10: Wound Infection

In Group I, 9 patients developed wound infection, 6 patients on 6th postoperative day and 4 on 7th postoperative day and culture showed growth of staphylococcus aureus sensitive to ciprofloxacin. In Group II, 41 patients developed wound infection; 19 patients had growth of staphylococcus aureus sensitive to ciprofloxacin, 4 patients had E. coli and other patient had Klebsiella sensitive to Norfloxacin.

	GROUP I	GROUP II
Agarwal 1997	NIL	6
Batra 1994	4	8
M. K. Swamy 1998	2	22
Brar et al.	12	32
Study Group	2	6.6

Table 11: Urinary Tract Infection

	GROUP I	GROUP II
Batra 1994	NIL	4
Brar et al. 1999	NIL	8
Samal 1988	2	2
M. K. Swamy 1998	1	15
Study Group	NIL	2

Table 12: Adverse Reactions

In Group II, 10 patients had diarrhoea for two days. In these cases Ampicillin was omitted and Ciprofloxacin started. In the present study, single dose use of Ceftriaxone has been documented to be more effective in controlling tissue inflammatory response.

Ceftriaxone is well tolerated after IV injection and has added advantage of better safety profile. Lower infection rates can be achieved using long acting antibiotics, such as ceftriaxone given as a single dose (1 gm). The above findings are correlating with the current recommendation by Society of Obstetricians and Gynaecologists of Canada Infectious Diseases Committee, all women undergoing elective or emergency Caesarean section should receive antibiotic prophylaxis. (I-A). The choice of antibiotic for Caesarean section should be a single dose of a first-generation cephalosporin.⁽¹¹⁾

SUMMARY

1. 500 cases of LOWER SEGMENT CAESAREAN SECTION were included in Group I and these were given Inj. Ceftriaxone 1 gm IV after clamping umbilical cord.
2. 500 cases of LOWER SEGMENT CAESAREAN SECTION were included in Group II and they were given Ampicillin 500 mgs BD and II Inj. Gentamicin 80 mgs BD for 5 days as in present practice.
3. Incidence of febrile morbidity in Ceftriaxone group was 4% and Ampicillin/Gentamicin group was 10.2% with P-value of <0.001.
4. Incidence of wound infection in Ceftriaxone group was 1.8% and in Ampicillin/Gentamicin group was 8.2% with P-value <0.001.
5. Culture and sensitivity of pus from wound shows the growth of staphylococcus aureus in Ceftriaxone group was 1.8% and Ampicillin/Gentamicin group was 8.2%.
6. Incidence of UTI in Ceftriaxone group was 2% and Ampicillin/Gentamicin group was 6.6% and the organisms responsible for UTI were E. coli in Group I. In Group II E. coli, Klebsiella and Proteus and appropriate antibiotics like Ciprofloxacin started.
7. Incidence of adverse reactions were nil in Ceftriaxone group and Ampicillin/Gentamicin group were 2%.
8. Overall, mean postoperative hospital stay was significantly less in Ceftriaxone group than Ampicillin/Gentamicin group.
9. Single dose Ceftriaxone prophylaxis is cost effective, in that the cost of treatment is 4 times less than that of conventional antibiotics Ampicillin/Gentamicin.
10. Ceftriaxone prophylaxis is safe, effective and convenient and saves man power, thus preventing irregularity in administering drugs and can easily replace the 5 days' extended use of antibiotics.

CONCLUSION

In the present study, antibiotic prophylaxis with single dose ceftriaxone 1 gm IV administered after umbilical cord clamping in caesarean section is very safe, cost effective, more convenient and also effective in reducing maternal morbidity and post-operative hospital stay when compared to traditional use of Ampicillin/Gentamicin in caesarean section.

REFERENCES

1. Gordon HR, Phelps D, Blanchard K. Prophylactic cesarean section antibiotics: maternal and neonatal morbidity before or after cord clamping. *Obstet Gynecol* 1973;53(2):151-6.

2. Kovitz J, Paldi E, Katz M. The effect of prophylactic antibiotics on febrile morbidity following cesarean section. *Obstet Gynecol* 1979;53(2):162-5.
3. Gall SA. The efficacy of prophylactic antibiotics in cesarean section. *AM J Obstet Gynecol* 1979;134(5):506-11.
4. Schulze G. Prophylactic antibiotics in cesarean section. *Zentralblatt Für Gynäkologie* 1980;102(12):659-63.
5. Hawrylyshyn PA, Berustein P, Papsin FR. Risk factors associated with infection following cesarean section. *AM J Obstet Gynecol* 1981;139(3):294-8.
6. Padilla SL, Spence MR, Beauchamp PJ. Single dose ampicillin for cesarean section prophylaxis. *Obstet Gynecol* 1983;61(4):463-6.
7. Saltzmann DH, Eron LJ, Kay HH, et al. Single dose antibiotic prophylaxis in high risk patients undergoing cesarean section. *Obstet Gynecol* 1985;65(5):655-7.
8. Sulovic V, Ljubic A, Cvetkovic M, et al. Ceftriaxone in prevention of complications after cesarean section and its influence on the newborn. *Clin Exp obstet gynecol* 1994;21(1):33-7.
9. Huam SH, Lim JM, Raman. Single dose antibiotic prophylaxis in women undergoing elective cesarean section. *Med J malaysia* 1997;52(1):3-7.
10. Bagratee JS, Moodley J, Kleinschmidt I, et al. A randomized trial of antibiotic prophylaxis in elective cesarean section. *BJOJ* 2002;109(12):1423-4.
11. Van Schalkwyk J, Van Eyk N. Antibiotic prophylaxis in obstetric procedures. *Journal of Obstetrics and Gynaecology Canada* 2010;32(9):878-92.