

COMPARISON OF EFFECTIVENESS OF AZITHROMYCIN AND CEFAZOLIN IN POST CAESAREAN SECTION INFECTION

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ABSTRACT

Objective: Prophylactic antibiotics have been shown to be effective in decreasing the incidence of febrile morbidity related with caesarean section after labour. The relative effectiveness of single antibiotics has been studied infrequently. Many new broad spectrum antibiotics are available now.

Method: A randomized prospective trial was conducted for testing the effectiveness of Azithromycin versus Cefazolin in preventing post caesarean section infection. This study was done in Department of Obstetrics and Gynaecology at the SRM Medical Research Centre and Hospital between September 2011 to February 2012. This study consisted of 70 pregnant women to which Azithromycin was given to 35 pregnant women and Cefazolin was given to 35 pregnant women as prophylactic antibiotics randomly. Women undergoing emergency, elective and non-elective caesarean surgery were included in the study and were given either drug as prophylaxis.

Results: This study showed that the incidence of postoperative fever, wound healing duration, pain and infection was significantly higher in Azithromycin group when compared with the Cefazolin group.

Conclusion: This study concluded that Cefazolin was found to be more effective in preventing post caesarean section infection than Azithromycin.

Keywords: Prophylaxis, Antibiotics, Caesarean, Infection.

INTRODUCTION

Infection is one of the major problems of caesarean delivery. Initiations have been done to reduce postpartum infections by the administration of an antibiotic prior to the surgery to prevent any pelvic infection. Factors which relate to an increase chance of infection in women who undergo caesarean delivery comprise of emergency caesarean delivery, labour and its duration, socioeconomic status of women, use of prophylactic antibiotic or not, number of vaginal examination, anaemia, vaginitis, chronic infection, blood loss, diabetes, type of anaesthesia, the technique of the operator and the procedure during the surgery. These infections are frequently poly microbial and involve the micro flora of the lower genital tract [1].

If prophylactic antibiotics are not used, the percentage of postpartum endometritis could be 35% to 40% higher than the normal rates. These rates differ according to the clinical circumstance; the regular use of prophylactic antibiotics will decrease the rate of infection [2].

Azithromycin is a macrolide antibiotic which is used to treat or prevent certain bacterial infections. It prevents bacteria from growing by interfering with their protein synthesis.

Cefazolin is a first generation cephalosporin antibiotic. Cefazolin is mainly used to treat bacterial infections. A cell wall is present in all bacterial cells as a protective covering. Cephalosporins disturb the synthesis of the peptidoglycan layer of the bacterial cell walls, causing the bacteria to die by the breakage of the cell walls [3].

In women who did either elective or non-elective caesarean surgery with no evidence of infection prior to the surgery, the therapy with prophylactic antibiotics has shown to decrease the risk of endometritis by two thirds to three quarters [4].

The objective of this study is to assess and compare the effectiveness of Azithromycin and Cefazolin as prophylactic antibiotics in preventing post caesarean infection.

MATERIALS AND METHODS

Significance of the study

Nowadays as there is a rise in number of women who undergo caesarean section every year the infection caused by this surgery is also likely to increase. The rate of endometritis is said to lie between

20 to 85% without prophylaxis [1]. Since many types of antibiotics are used as prophylactic antibiotics, the investigator is trying to study about certain antibiotics which are used to prevent post caesarean infection.

Research design

This was a randomised prospective study.

Setting

This study was carried out at the Department of Obstetrics & Gynaecology, SRM Medical Research Centre and Hospital in Kattankulathur, Kancheepuram District, from September 2011 till February 2012. Follow up of the cases were finished in March 2012. The study was carried out after proper approval from the Human Ethical committee of the SRM Medical Research Centre and Hospital on 30th August 2011.

Participants

Women who underwent elective/non elective caesarean section while in labour and those who had emergency caesarean section were included in this study and were given any one of the two drugs in a random manner. Those women who had signs of obvious infection, suspected renal impairment by history or lab evidence, who has known drug hypersensitivity to Azithromycin or Cephalosporin, who were recently administered with antibiotics, diabetic and anaemic pregnant women were excluded from this study.

70 pregnant women were taken into the study, from which 35 were given Azithromycin and 35 were given Cefazolin in a random order as prophylactic antibiotic.

Tools of data collection

An interview questionnaire was made and was used to collect the data. It contains the socio demographic data, obstetrical data, past obstetrical history, current pregnancy data, data about the current caesarean section delivery and data about any kind of wound infection.

Data was collected from September 2011 till February 2012 for 6 months and follow up was carried out till March 2012. Permission was given by the Head of Department of the Obstetrics & Gynaecology Department at SRM Medical Research Centre and Hospital.

Interviewing stage

Here the investigator interviewed the pregnant women and explained to her in detail about the study, obtained her full history and consent to be included in the study.

Intervention stage

The pregnant women were randomly given either Azithromycin or Cefazolin prophylactic antibiotics. The full medical and obstetrical history was obtained from the mother, her vital signs, her temperature and pulse was taken prior to the surgery. The mother was brought inside the operation theatre along with the antibiotic that was chosen for her. The anaesthetist was informed whether 1g of Cefazolin or 500mg of Azithromycin should be given to the mother accordingly half an hour prior to the surgery. After the

mother received spinal or general anaesthesia the Obstetrician does the surgery.

Follow up stage

The same day and the next day after the surgery the investigator checked the patient and her case sheet if she had any post operative fever. Till the patient was discharged the investigator observed for any kind of fever or infection. The mother was then asked to come for follow up to check for any post partum infection and how soon the wound healed.

RESULTS

Total of 70 patients were enrolled in the study, to which 35 were given Azithromycin and 35 were given Cefazolin.

Table 1: Women's socio demographic characteristics

Socio-demographic characteristics	Azithromycin group		Cefazolin group	
	Number of Patients	Percent (%)	Number of Patients	Percent (%)
1) Age/years*				
• 16-24 years	19	54.3	14	40.0
• 25-30 years	15	42.9	15	42.9
• More than 30 years	1	2.9	6	17.1
2) Occupation*				
• Housewife	33	94.3	32	91.4
• Employed	2	5.7	3	8.6
3) Residence*				
• Urban areas	5	14.2	4	11.4
• Rural areas	30	85.7	31	88.5

* p>0.5, Chi-Square Test

Table 2: Pregnancy status and admission data

Variable	Azithromycin group		Cefazolin group	
	Number of Patients	Percent (%)	Number of Patients	Percent (%)
1) Gestational age/weeks*				
• Less than 36 weeks	3	8.6	1	2.9
• 36-40 weeks	27	77.1	31	88.6
• More than 40 weeks	5	14.3	3	8.5
2) Number P.V examination/Times*				
• Not done	2	5.7	3	8.6
• 1-5	30	85.7	27	77.1
• More than 5	3	8.6	5	14.3

* p>0.5, Chi-Square Test

Table 3: Operation characteristics

Variable	Azithromycin group		Cefazolin group	
	Number of Patients	Percent (%)	Number of Patients	Percent (%)
1) Duration of C.S/minute*				
• Within 30 min	1	2.9	5	14.3
• 31-60 min	33	94.2	30	85.7
• More than 60 min	1	2.9	0	0
2) Type of anaesthesia*				
• General	33	94.3	33	94.3
• Spinal	2	5.7	2	5.7

* p>0.5, Chi-Square Test

Table 4: Outcomes related to infection between the two groups

Outcome variable	Azithromycin group		Cefazolin group	
	Number of Patients	Percent (%)	Number of Patients	Percent (%)
1) Post-operative fever*				
• No	32	91.4	35	100
• Yes	3	8.6	0	0.0
2) Wound healing duration*				
• Healing within 10 days	32	91.4	35	100
• Healing within 20 days	3	8.6	0	0.0
3) Pain**				
• For 6 days	12	34.2	30	85.7
• For 7-9 days	23	65.8	5	14.3
4) Infection*				
• No	32	91.4	35	100
• Yes	3	8.6	0	0.0

5) PV discharge*				
• No	32	91.4	35	100
• Yes	3	8.6	0	0.0

* p<0.05, Chi Square Test, $\chi^2=3.314$

** p< 0.001, Chi Square Test, $\chi^2=19.418$

DISCUSSION

Those patients who underwent a caesarean surgery spend a minimum of 4 days in the ward if there is no post operative morbidity. In case of infections or any other problems they may spend twice as many days in the hospital. As per reference from other studies the most common post operative infection is abdominal wound infection. Length of stay in hospital will be reduced if any therapy is done to reduce the complications which will speed up recovery.

Broad spectrum antibiotics are most commonly used as prophylactic antibiotics, and in this randomized prospective study, Cefazolin was compared with Azithromycin.

This study with regards to demographic characteristics, maternal characteristics in obstetrical history and current data related to this delivery illustrates that there was no statistically significant difference.

This study shows that majority of the mothers were housewives (94.3% in Azithromycin group and 91.4% in Cefazolin group). It also reveals that majority of the mothers had similar gestational age/weeks (36-40 weeks), in Azithromycin group 77.1% and in Cefazolin group 88.6%.

With regards to number of PV examination this study illustrates that there was no significant difference between both groups. Most of the mothers were examined between 1-5 times (85.7% in Azithromycin group and 77.1% of Cefazolin group).

With reference to the duration of caesarean section, this study showed that most women (94.2% in Azithromycin group and 85.7% in Cefazolin group) had their surgeries finished within (30-60) minutes [6].

With reference to post operative fever, wound healing duration, post caesarean infection and par vaginal discharge it was found that there was a statistical difference when both drugs were given and compared. 3 patients who were given Azithromycin had post-operative fever, wound healing duration over 20 days, post caesarean infection and par vaginal discharge.

CONCLUSION

As confirmed by the USFDA and WHO there is a rise in the rate of infectious morbidity and infections during caesarean section. Prophylactic antibiotics are the treatment strategy to reduce such complaints. This study was aimed at assessing and comparing the effectiveness of Azithromycin and Cefazolin as prophylactic antibiotics prior to caesarean section. The effectiveness of these antibiotics in preventing post caesarean infections and infectious morbidity was assessed based on certain parameters. At the end of this research we observed that, with regards to post operative fever, wound healing duration, infection post surgery and par-vaginal discharge it was found that Azithromycin was not as effective as Cefazolin in preventing post caesarean infection. Within the group of patients included in the study, demographic characteristics, maternal characteristics in obstetrical history and current data related to this delivery illustrates that there was statistically no significant difference.

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REFERENCES

1. John Wiley & Sons, Smaill F, Hofmeyr GJ. The Cochrane Collaboration, antibiotic prophylaxis for caesarean section. (Review) 2007.
2. Pedersen TK, Blaakaer J. Antibiotic prophylaxis in cesarean section. Acta Obstet Gynecol Scand 1996;75:537-539.
3. Jay W., Marks. Amoxicillin: drug class and mechanism. Medicine Net, Inc. 2007.
4. Smaill F, Hofmeyr GJ. Antibiotic prophylaxis for cesarean section. Cochrane Database Syst Rev 2002;3:CD000933.
5. Johnson A, Young D, Reilly J. Caesarean section surgical site infection surveillance. J Hosp Infect 2006;64:30-35.
6. Eleftherios Z, Sotirios T, Ioannis M, Helen G. Ampicillin/Sulbactam versus Cefuroxime as antimicrobial prophylaxis for caesarean delivery. BMC Infectious Diseases 2010;10:341.
7. Fariba AN, Hossein A, Mansour R. Timing of prophylactic antibiotic administration in term caesarean section. Iranian Journal of Clinical Infectious Diseases 2009;4(2):71-76.
8. Haider G, Zehra N, Munir A, Haider A. Frequency and indications of caesarean section in a tertiary care hospital. Pak J Med Sci 2009;25(5):791-796.
9. Kayihura V, Osman NB, Bugalho A, Bergstrom S. Choice of antibiotics for infection prophylaxis in emergency cesarean sections in low-income countries: a cost-benefit study in Mozambique. Acta Obstet Gynecol Scand 2003;82:636-41.
10. Meyer NL, Hosier KV, Scott K, Lipscomb GH. Cefazolin versus Cefazolin plus metronidazole for antibiotic prophylaxis at cesarean section. Southern Medical Journal 2003;96:992-995.
11. Rudge MV, Atallah AN, Peracoli JC, Tristao R, Mendonca M. Randomized controlled trial on prevention of post cesarean infection using penicillin and cephalothin in Brazil. Acta Obstet Gynecol Scand 2006;85:945-948.
12. Shah S, Mazher Y, John IS. Single or triple dose piperacillin prophylaxis in elective cesarean section. Int J Gynaecol Obstet 1998; 62: 23-29.
13. Shetty J, Rajasekar S, Kamath A. Short term antibiotic prophylaxis for emergency caesarean delivery. Int J Gynaecol Obstet 2009; 11(1).
14. Tippawan L, Pisake L, Virasakdi C. Prophylactic antibiotic prescription for caesarean section. International Journal for Quality in Health Care 2002; 14(6):503-508.
15. Tita AT, Rouse DJ, Saade GR, Spong CY, Andrews WW. Emerging concepts in antibiotic prophylaxis for cesarean delivery: a systematic review. Obstet Gynecol 2009; 113(3):675-682.
16. Walaa H, Makhlof AM, Mervat A, Entisar M. Effect of prophylactic antibiotics on preventing post caesarean section infection. Journal of American Science 2011;7(5):1-5.
17. Wax JR, Hersey K, Philput C, Wright MS, Nichols KV. Single dose Cefazolin prophylaxis for post caesarean infections: before versus after cord clamping. The Journal of maternal-fetal medicine 1997; 6:61-65.
18. Zorica G, Jovan P, Mirijana B, Ilija G. Preoperative administration of cephalosporins for elective caesarean delivery. Srp Arh Celok Lek 2010; 138(9-10):600-603.
19. Ashok kumar., Kingston R., Chandrasekhar S., 'Antibiotic surveillance: A survey on the susceptibility of microorganisms to antibiotics in respiratory tract infections' Int J Pharmacy and Pharm Sci 2012; 4(4):181-185.
20. Arulprakasam K.C., Senthilkumar N., Ramesh J., 'Students' knowledge of antibiotics: Across-sectional study of students in Tamilnadu' Int J Pharmacy and Pharm Sci 2011; 3(1):232-233.