Online ISSN: 2581-3935
Print ISSN: 2589-7837
International Journal of Medical Science and Diagnosis Research (IJMSDR)
Available Online at www.ijmsdr.com
Volume 2, Issue 6; November-December: 2018; Page No. 113-117

PROPHYLACTIC VERSUS REGULAR USE OF ANTIBIOTICS IN CESAREAN SECTION

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Abstract:
The aim of this study was to compare the prophylactic use of antibiotic verses regular antibiotics in caesarean section.

Background: Present study was conducted at Shri Vinoba Bhave Civil Hospital, Silvassa in the department of OBGY. A total of 200 patients were included in the study. Patients were divided into two groups, first group of 100 was designated as prophylactic group and second group of 100 patients who received full antibiotic and designated as regular group. A written informed consent from all the patients was taken.

Result: In post-operative morbidities 2 % each in both the groups experienced fever which was statistically non-significant; in prophylactic group 3% had wound infection while in regular group only 1% had wound infection which was non-significant. Urinary tract infection was observed in 1% and 2% in prophylactic group and regular group respectively which was also non-significant.in no case septicaemia was observed.

Conclusion: Single dose antibiotic prophylaxis in caesarean section is recommended as multiple dose or regular use of antibiotics in elective caesarean section does not significantly reduce the postoperative complications and can increase the burden of antibiotic resistance.

INTRODUCTION

Surgical procedures commonly resulted in post-operative sepsis and death prior to mid nineteenth century. In 1860 Joseph Lister introduced the principles of anti-sepsis due to which post-operative infectious morbidity and mortality fell markedly from 50% to 15%[i]. After caesarean section maternal mortality and morbidity may occur from a number of infections which includes fever (febrile morbidity) urinary tract infection (UTI), endometritis and surgical site infection (SSI)[ii]. Occasionally there may be serious infectious complications including pelvic abscess (collection of pus in the pelvis), bacteraemia (bacterial infection in the blood), septic shock (reduced blood volume due to infection), necrotizing fasciitis (tissue destruction in the uterine wall) and septic pelvic vein thrombo phlebitis (inflammation and infection of the veins in the pelvis); and these can lead to maternal mortality[iii, iv, v].

Following elective caesarean surgery, wound infection in patients who receive peri-operative antibiotics i.e. within three hours following surgery, is 1.4% compared with 0.6% in those who receive antibiotics within two hours prior to surgery[vi] and prophylactic antibiotics reduce the incidence of SSIs[vii]. Women on whom caesarean section has been performed have a five to 20-fold greater risk for infection and infectious morbidity compared with a vaginal birth[viii]. Infectious complications that occur after caesarean births are an important l cause of maternal morbidity and many times they are associated with a significant increase in hospital stay[ix]. The pooled mean rate of surgical site infections after caesarean section in US hospitals from January 1992 to June 2004 was 3.15%, 2.71% for low-risk patients and 7.53% for high-risk patients[x].

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The most important source responsible for post-caesarean section infection is the genital tract, particularly if the membranes are ruptured. Even in the presence of intact membranes, microbial invasion of the intrauterine cavity is common, especially with preterm labour[xi].

Guidelines recommend the use of narrow spectrum antibiotics for prophylaxis based on factors such as cost, half-life, safety and antimicrobial resistance and also to avoid broad spectrum antibiotics that are usually reserved for treatment[xii]. But the potential adverse effects cannot be ruled out which include gastrointestinal symptoms (nausea, vomiting or diarrhoea), skin rashes, thrush (candidiasis, which can affect both mother and baby) and joint pain[xiii].

The aim of this study was to compare the prophylactic use of antibiotic verses regular antibiotics in caesarean section.

MATERIAL AND METHODS

Present study was conducted at Shri Vinoba Bhave Civil Hospital, Silvassa in the department of OBGY. A total of 200 patients were included in the study. Patients were divided into two groups, first group of 100 was designated as prophylactic group and second group of 100 patients who received full antibiotic and designated as regular group. A written informed consent from all the patients was taken.

Baseline assessment of all the participants including vital signs, general physical, systemic and gynaecological examination were performed and then routine blood and urine analysis, urine culture and sensitivity, high vaginal swab culture and sensitivity was done. Inclusion criteria were women who are undergoing elective caesarean section. An exclusion criterion was hypersensitivity to cephalosporins, co-existing diseases like diabetes mellitus, hypertension or cardiac problem that will require multi dose antibiotics. Patients on steroids, immunocompromised patients, severe anaemia, heart disease.

Cefotaxime single dose 1g intravenous after cord clamping was given to prophylactic group. In regular group broad spectrum antibiotics or combination of the antibiotics was administered to the regular group according to the prescription of the treating obstetrician. 4th hourly monitoring of temperature, vital signs, abdominal, perineal examinations was performed daily till 7days. If on two occasion of 4 hours apart body temperature is 101˚F it was considered as febrile morbidity and appropriate investigations were done like blood culture, high vaginal swab culture or urine culture before starting the multidose antibiotics.

Wound was inspected for infections, pus, SSIs, dehiscence, hematoma or pelvic abscesses. All patients were followed up up to 3 months of the surgery.

Incidence of postoperative febrile morbidity, pus formation, wound gaping, dehiscence, UTI, pelvic abscess was noted as primary outcome.

RESULTS

A total of 200 patients were included in the study. 100 each in prophylactic group and regular group. Mean age of all the patients was 26 ± 3.6 years, in prophylactic group it was 25 ±2.3 and in regular group was 27 ± 2.1 years.

Table 1: Post-operative morbidities

complications	prophylactic group	Regular group	CI (P value)
Fever	2 (2%)	2 (2%)	-5.2071 to 5.2071, P = 1.0000 NS
Wound infection	3 (3%)	1 (2%)	-2.8671 to 7.5137, P = 0.3136 NS
Urinary tract infection	1(1%)	2 (2%)	-3.6789 to 6.0685, P = 0.5617 NS
septicaemia	0	0	

CI: Confidence Interval

In post-operative morbidities 2 % each in both the groups experienced fever which was statistically non-significant; in prophylactic group 3% had wound infection while in regular group only 1% had wound infection which was non-significant. Urinary tract infection was observed in 1% and 2% in prophylactic group and regular group respectively which was also non-significant.in no case septicaemia was observed.

Hospital stay in prophylactic group was 6±1.7 and in regular group it was 6 ±2.1

DISCUSSION

Antibiotic prophylaxis for women undergoing caesarean section is beneficial in decreasing post-operative infectious morbidity both in high-risk (in labor post membrane rupture), as well as low-risk patients, (non-labor with intact membranes)[xiv], [xv]. Also it has been observed that a single dose of antibiotics is as effective as multiple doses given peri-operatively[xvi]. It was found that use of preoperative antibiotics at the time of non-labouring caesarean section significantly reduced the risks of postpartum endometritis and wound infection[xvii].There are many factors that can contribute to the development of postoperative wound infection like low haemoglobin level, malnutrition and multi parity .

In our study it was observed that 2% each both the group had episode of fever following caesarean section. According to MacLean 1990[xix], fever can occur after any operative procedure, and a low grade fever following a caesarean section may not necessarily be a marker of infection and without antibiotic prophylaxis, the incidence of endometritis is reported to range from 20% to 85%; rates of wound infection and serious infectious complications as high as 25% have been reported by EnkinMW in 1989[xx].

In a developing country like India, most of the cases of caesarean delivery are from the low socioeconomic group and may not be exposed to the obstetrics services by the experts and therefore they may be having some infections or other co morbidities which are not diagnosed until delivery. In one of the review it was observed that and were unable to address the important issue of whether prophylactic antibiotic administration should be administered prior to skin incision or following cord clamping. Also they were unable to address the efficacy of the different types of antibiotics used. But they confirmed that the use of perioperative antibiotics at the time of caesarean delivery prior to labour, regardless of the presence of membrane rupture, significantly decreases the risks of endometritis and wound infection[xxi].

Wound infections in prophylactic group were higher 3% as compared to the regular group 1%. But these values were insignificant. So whether to administer full course of antibiotics or single prophylactic dose is still a debate. But in this era of antibiotics resistance administration of unwanted antibiotics empirically is a not justified. In a 12 trials, 2875 women here were no significant differences between comparison groups for maternal sepsis (RR 2.37, 95% CI 0.10 to 56.41; 1 trial, 75 women), endometritis (RR 0.90, 95% CI 0.60 to 1.35, 10 trials, 2134 women), maternal febrile morbidity (RR 0.92, 95% CI 0.56 to 1.49; 6 trials, 1824 women), wound infection (RR 0.72, 95% CI 0.40 to 1.30; 7 trials, 1608 women) or maternal urinary tract infection (RR 0.66, 95% CI 0.17 to 2.55; 6 trials, 1361 women). There were no significant differences between antibiotic classes on maternal composite adverse effects (RR 0.96, 95% CI 0.09 to 10.50; 4 trials, 1333 women)[xxii].

Postoperative wound infection can be reduced by adopting preventive measures like preoperative baths, changing clothes before the shifting the patient to operation theatre, disposables gowns etc. in our study superficial wound infections was noted as 3% and 1% in prophylactic and regular group which was as compared to the study by Nisa et al[xxiii]. in which they had a rate of 6.5% of

In a review of 95 studies of over 15,000 women. Compared with placebo or no treatment, the use of prophylactic antibiotics in women undergoing caesarean section there was significant reduction in the incidence of wound infection (RR 0.40,

95% CI 0.35 to 0.46, 82 studies, 14,407 women), endometritis (RR 0.38, 95% CI 0.34 to 0.42, 83 studies, 13,548 women) and maternal serious infectious complications (RR 0.31, 95% CI 0.20 to 0.49, 32 studies, 6159 women). When only studies that included women undergoing an elective caesarean section were analysed, there was also a reduction in the incidence of wound infections (RR 0.62, 95% CI 0.47 to 0.82, 17 studies, 3537 women) and endometritis (RR 0.38, 95% CI 0.24 to 0.61, 15 studies, 2502 women) with prophylactic antibiotics and recommended that prophylactic antibiotics should be routinely administered to women undergoing caesarean section to prevent infection. The use of prophylactic antibiotics in women undergoing caesarean section reduced the incidence of wound infection, endometritis and serious infectious complications by 60% to 70%. [xxiv].So antibiotic prophylaxis is advised prior to caesarean section.

Hospital stay in both the group was almost similar in both the group which means that single dose prophylaxis and regular use of antibiotics does not affect the stay of patients in hospital and is directly related to the wound healing similar results were shown by Tchabo JG et al in his study[xxv].

CONCLUSION

Single dose antibiotic prophylaxis in caesarean section is recommended as multiple dose or regular use of antibiotics in elective caesarean section does not significantly reduce the postoperative complications and can increase the burden of antibiotic resistance.

REFERENCES

1. [i]Lamont RF, Sobel JD, Kusanovic JP, et al. Current debate on the use of antibiotic prophylaxis for caesarean section. BJOG. 2011;118(2):193-201.
2. [ii]Berg CJ, Chang J, Callaghan WM, Whitehead SJ. Pregnancy-related mortality in the United States, 1991-1997.Obstet Gynecol. 2003 Feb; 101(2):289-96.
3. [iii]Enkin 1989. Enkin MW, Enkin E, Chalmers I, Hemminki E. Prophylactic antibiotics in association with caesarean section. In: Chalmers I, Enkin MW, Keirse MJNC, editors. Effective care in pregnancy and childbirth. Oxford University Press; Oxford: 1989. pp. 1246–69.
4. [iv]Gibbs RS. Clinical risk factors for puerperal infection.Obstet Gynecol. 1980 May; 55(5 Suppl):178S-184S.
5. [v]Boggess KA, Watts DH, Hillier SL, Krohn MA, Benedetti TJ, Eschenbach DA. Bacteremia shortly after placental separation during cesarean delivery.Obstet Gynecol. 1996 May; 87(5 Pt 1):779-84.
6. [vi]Classen DC, Evans RS, Pestotnik SL, Horn SD, Menlove RL, Burke JP.The timing of prophylactic administration of antibiotics and the risk of surgical-wound infection.N Engl J Med. 1992 Jan 30; 326(5):281-6.
7. [vii]Smaill F, Hofmeyr GJ. Antibiotic prophylaxis for cesarean section.Cochrane Database Syst Rev. 2002; (3):CD000933.
8. [viii]Declercq E, Barger M, Cabral HJ, Evans SR, Kotelchuck M, Simon C, Weiss J, Heffner LJ. Maternal outcomes associated with planned primary cesarean births compared with planned vaginal births.Obstet Gynecol. 2007 Mar; 109(3):669-77.
9. [ix]Henderson E, Love EJ.Incidence of hospital-acquired infections associated with caesarean section.J Hosp Infect. 1995 Apr; 29(4):245-55.
10. [x]National Nosocomial Infections Surveillance System.National Nosocomial Infections Surveillance (NNIS) System Report, data summary from January 1992 through June 2004, issued October 2004.Am J Infect Control. 2004 Dec; 32(8):470-85.
11. [xi]Watts DH, Krohn MA, Hillier SL, Eschenbach DA.The association of occult amniotic fluid infection with gestational age and neonatal outcome among women in preterm labor.Obstet Gynecol. 1992 Mar; 79(3):351-7.
12. [xii]Bratzler DW, Houck PM, Surgical Infection Prevention Guidelines Writers Workgroup., American Academy of Orthopaedic Surgeons., American

Association of Critical Care Nurses., American Association of Nurse Anesthetists., American College of Surgeons., American College of Osteopathic Surgeons., American Geriatrics Society., American Society of Anesthesiologists., American Society of Colon and Rectal Surgeons., American Society of Health-System Pharmacists., American Society of Peri anesthesia Nurses., Ascension Health., Association of peri operative Registered Nurses., Association for Professionals in Infection Control and Epidemiology., Infectious Diseases Society of America., Medical Letter., Premier., Society for Healthcare Epidemiology of America., Society of Thoracic Surgeons., Surgical Infection Society. Antimicrobial prophylaxis for surgery: an advisory statement from the National Surgical Infection Prevention Project.Clin Infect Dis. 2004 Jun 15; 38(12):1706-15.

13. [xiii]Dancer SJ How antibiotics can make us sick: the less obvious adverse effects of antimicrobial chemotherapy.Lancet Infect Dis. 2004 Oct; 4(10):611-9.
14. [xiv]Smaill F, Hofmeyr GJ. Antibiotic prophylaxis for cesarean section.Cochrane Database Syst Rev. 2002; (3):CD000933.
15. [xv]Chelmow D, Ruehli MS, Huang E. Prophylactic use of antibiotics for nonlaboring patients undergoing cesarean delivery with intact membranes: a meta-analysis.Am J Obstet Gynecol. 2001 Mar; 184(4):656-61.
16. [xvi]Saltzman DH, Eron LJ, Tuomala RE, Protomastro LJ, Sites JG. Single-dose antibiotic prophylaxis in high-risk patients undergoing cesarean section. A comparative trial.J Reprod Med. 1986 Aug; 31(8):709-12.
17. [xvii]Dinsmoor MJ, Gilbert S, Landon MB, et al. Perioperative antibiotic prophylaxis for nonlaboring cesarean delivery. Obstet Gynecol. 2009;114(4):752-6.
18. [xviii]Griffiths J, Demianczuk N, Cordoviz M, Joffe AM. Surgical site infection following elective caesarean section: a case-control study of post discharge surveillance. J Obstet Gynaecol Can 2005;27:340-4
19. [xix]MacLean AB. Puerperal pyrexia. In: MacLean AB, editor. Clinical Infection in Obstetrics and Gynecology. Blackwell Scientific Publications; Oxford: 1990. pp. 195–209
20. [xx]Enkin MW, Enkin E, Chalmers I, Hemminki E. Prophylactic antibiotics in association with caesarean section. In: Chalmers I, Enkin MW, Keirse MJNC, editors. Effective care in pregnancy and childbirth. Oxford University Press; Oxford: 1989. pp. 1246–69.
21. [xxi]Dinsmoor MJ, Gilbert S, Landon MB, et al. Perioperative antibiotic prophylaxis for nonlaboring cesarean delivery. Obstet Gynecol. 2009;114(4):752-6.
22. [xxii]https://extranet.who.int/rhl/topics/preconception-pregnancy-childbirth-and-postpartum-care/who-recommendation-antibiotic-prophylaxis-caesarean-section-using-single-dose-first-generation
23. [xxiii]Nisa M, Naz T, Afzal I, Hassan L. Scope of surgical site infection (SSI) in obstertrics and gynaecology. J Postgrad Med Inst 2005;19:438-9.
24. [xxiv]Smaill FM, Grivell RM. Antibiotic prophylaxis versus no prophylaxis for preventing infection after cesarean section. Cochrane Database of Systematic Review 2014, Issue 10. Art. No.: CD007482. DOI: 10.1002/14651858.CD007482
25. [xxv]Tchabo JG, Cutting ME, Butter C. Prophylactic antibiotic in patients undergoing total vaginal or abdominal hysterectomy. Int Surg 1985;70:349-52.