



## Original Research Article

## The study of single dose antibiotic in caesarean section

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## ABSTRACT

**Introduction:** Wound infection is a common problem in obstetric and surgical procedures. It is not clear whether perioperative prophylaxis of one portion of anti-infective agents is sufficient to prevent wound contamination. This test was aimed at assessing whether anti-infection of one perioperative part was successful in counteracting diseases after use in women undergoing caesarean section.

**Materials and Methods:** This is a multicentre study. Participants were given a single dose of 1 g of cefotaxime intravenously before surgery, and the incidence of postoperative complications such as wound infections, wound resuturing, etc. was monitored.

**Results:** The study included 100 elective caesarean sections. Cefotaxime injection of 1 g IV was injected 30 minutes before surgery. The incidence of febrile morbidity was seen in 10 %, and wound infection was in 5% of total patient. The microorganisms isolated from the wound infection were E. coli, Pseudomonas, which were sensitive to cefoperazone-sulbactam and linezolid. The average length of hospital stay was 4 days.

**Conclusion:** A single prophylactic dose of cefotaxime is effective for the prevention of postoperative infection. The results obtained in this study shows that single-dose antibiotic prophylaxis is effective. The resistance of microorganisms can be prevented with this prophylactic single-dose antibiotic. This prospective study confirms that one-time antibiotic prophylaxis had a positive effect on women undergoing a planned caesarean section.

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## 1. Introduction

Preventive antibiotics in surgery are aimed at preventing morbidity and mortality, as well as reducing the duration and cost of hospitalization.<sup>1</sup> Prophylactic antibiotics are useful for preventing postoperative infection. Single prophylaxis can help reduce the development of microbial resistance.<sup>2</sup> Studies have shown the effectiveness of antibiotic prophylaxis for the prevention of surgical infections. Single dose prophylaxis has not been accepted, and many centers still use multiple dose regimens.<sup>3–6</sup> Perioperative management has been recommended in surgical procedures, but recent guidelines and publications have shown that single antibiotic prophylaxis is equally effective in clean and clean contaminated surgical procedures.<sup>7,8</sup>

operation Improving aseptic and surgical methods and using antibiotics as prevention reduced postoperative wound infections. Caesarean section is more susceptible to wound infections than vaginal.<sup>9,10</sup> Febrile incidence often after caesarean section.<sup>11</sup>

Numerous studies have shown that a single dose of an antimicrobial agent prescribed during caesarean section, significantly reduces infectious morbidity. The timing of antibiotic prophylaxis was not addressed specifically in the review.<sup>12</sup> Surgical antimicrobial prophylaxis refers to a very short course of an antimicrobial agent initiated immediately before the start of an operation.<sup>13–16</sup>

Antimicrobial prophylaxis is an attempt not to sterilize tissue, but it is a critically timely supplement that is used to reduce the microbial load from intraoperative contamination at a level that cannot exceed the host's immunity. When administered intravenously, the initial

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dose of the antimicrobial prophylactic agent is calculated so that the bactericidal concentration of the drug is set in the serum and at the tissue level when the incision is made, maintaining the therapeutic levels of the antimicrobial agent in the serum and tissue levels, after closing the incision in the operating room.<sup>17–19</sup> Therefore, prophylactic antibiotics are not intended to cover all possible pathogens that can cause an infection. By reducing the number of organisms present (the bacterial load) will allow the patient's immune defenses to function properly. Antibiotics given before the skin incision can further reduce the risk of postoperative infection. Antibiotics must be present properly in the tissue at the time of the incision to be effective. Postoperative antimicrobial prophylaxis is unnecessary, since it increases the cost and causes resistance to drugs with resistant bacteria.<sup>20</sup> There is insufficient data on the timing of the introduction (before surgery and after clamping the umbilical cord) of caesarean section antibiotic prophylaxis. In almost all studies published since 1978, the antimicrobial drug was administered immediately after the umbilical cord tension. Prior to this, prophylactic agents were administered before surgery.<sup>21</sup> This dramatic change in practice followed the publication of a prospective, randomized, placebo-controlled study that demonstrated that prophylactic ampicillin, administered after the umbilical cord, is as effective in reducing maternal morbidity as ampicillin, administered before the procedure. For effective antibiotic prophylaxis, several important criteria must be met. First, the surgical procedure must have a significant risk of bacterial contamination and, in the absence of prophylactic antibiotics, a significant incidence of infection at the surgical site. Second, the prophylactic antibiotic administered must be effective against expected pathogens and have a low incidence of side effects. Thirdly, the antibiotic should not be therapeutically in the usual way. Although many antibiotic regimens have been shown to be effective in prospective and randomized studies for gynecological surgery, cephalosporins have become a common antibiotic because of their effectiveness, low frequency of side effects and low cost.<sup>22</sup> Finally, for effective antibiotic prophylaxis. The level of tissue selected antibiotic should be optimal at the moment when there is bacterial contamination of the surgical site. This means that the antibiotic should be injected shortly before the operation. However, there is still a lot of confusion about the effectiveness of single-dose antibiotic prophylaxis before planned obstetric and gynecological surgery. This study was conducted to assess the effectiveness of single-dose antibiotic prophylaxis with elective caesarean section.

## 2. Materials and Methods

The study was carried out in a multicenter and initial assessment which included vital signs, a general physical examination, systemic and gynecological examinations,

followed by blood tests (CBC, RBS, RFT) and a routine urine test, urine culture and sensitivity, and sowing. high vaginal smear and sensitivity outside.

### 2.1. Inclusion criteria

1. Elective Caesarean section of reserved cases.

### 2.2. Exclusion criterion

1. Women with known or suspected cephalosporin sensitivity.

2. Any coexisting disease, such as diabetes, hypertension, or heart problems that may require multiple doses of antibiotic

3. Unreserved cases, patients with premature rupture of membranes, GDM, Anemia, PIH, heart diseases

Written informed consent was obtained from all participants. Within 24 hours prior to surgery, an initial evaluation was performed, which included vital signs, general condition, systemic and gynecological examinations. Routine blood tests (CBC, RBS and RFT) and routine urinalysis, urine culture and sensitivity, high vaginal culture and sensitivity were performed. Cefotaxime was administered a single dose of 1 g intravenously (after the test dose) during the incision in the caesarean section.

During the postoperative period, the 4th hour of monitoring the temperature, vital signs, abdominal, perineal examination were carried out daily for up to 4 days, and the patient was discharged. If the body temperature was above 100 degrees Fahrenheit on 2 occasions 4 hourly or more, excluding the night of the operation, febrile morbidity was taken into account and appropriate investigations carried out, including urine culture, blood culture and Vaginal swab before stating the corresponding multiple doses of antibiotics. The wound was examined for the presence of a superficial or deep infection, pus secretion, formation of an abscess at the surgical site, wound dissection, hematoma of the fornix and pelvic abscess. During discharge from hospital, patients were asked to be contacted if they had signs and symptoms of infection. All patients were observed for up to 3 months at monthly intervals.

## 3. Discussion

The main goal of prophylactic antibiotics is to reduce infection and, consequently, reduce morbidity and mortality. Caesarean section antibiotic prophylaxis should be perioperative, providing a high concentration of plasma antibiotics during surgery. Several recent studies in obstetric cases have shown that prophylactic antibiotics play a certain role. Many antibiotics are used in various combinations, single or multiple regimens, administered before surgery or for several days. Many studies have shown that the adequate and timely prescription of prophylactic antibiotics can prevent postoperative infection. Wound infection is

an important postoperative complication. This is due to readmission in the hospital, treatment, a long stay in the hospital, and significant clinical and economic consequences.

Of the 100 patients in caesarean section, 64 patients were multipara, and only 36 patients were primigravida, and the indication for C. section was breech persistent and cephalo-pelvic disproportion. The age was between 18-27 years old. The duration of the operation was 25-40 minutes. The average blood loss was 200-300ml. The length of hospital stay was 4 days. In 10 patients after the 2nd day there was fever.

These patients were examined, blood samples were sent to CBC, peripheral blood smear for MP, MF, Dengue, urine microscopy, urine culture and sensitivity, high vaginal smear on culture and sensitivity. The investigations were normal in these patients. Because of the fever, a paracetamol 650 TID tablet started and the temperature dropped. Suture removal done on the 8<sup>th</sup> postoperative day and there was no wound infection.

Total 2 patients had a superficial wound infection on the 5<sup>th</sup> and 3 patients had on 8<sup>th</sup> day after the operation, so the culture and sensitivity samples taken from the wound were taken. Appropriate antibiotics were administered for 7 days according to a culture and sensitivity report. Re-hospitalization and resuturing were performed for only two patients on the 10<sup>th</sup> day postoperative and were discharged on the 16<sup>th</sup> day after the operation.

Other 3 patients in the LSCS had discharges from the wound on the 8<sup>th</sup> day after the operation, the growth of the organism *Pseudomonas*, which was sensitive to cefoperazone-sulbactam, was detected from the smear of the wound. This patient was treated with cefoperazone-sulbactam, 1 g IV, for 7 days. Resuturing was performed on the 13th day after the operation and was discharged on the 17th day after the operation.

It was noted that patients were mainly in the age group from 18 to 27 years old, most of the blood was lost between 200 and 300 ml of blood, and the duration of the operation varied from 25 to 40 minutes.

In our study 10% had febrile morbidity and 5 % had wound infections and Whereas Mohan J et al. had 5.8% febrile incidence and 2.32 % wound infection which is low compare to our study.<sup>23</sup>

Whereas in McGregor JA et al<sup>24</sup> had 4% wound infection which is similar to our results but febrile morbidity was 15% febrile which is high compare to our study.

#### 4. Conclusion

The administration of a single prophylactic dose of cefotaxime is effective for the prevention of postoperative complications. The results obtained in this study show that single-dose antibiotic prophylaxis is also effective. It is economical. The resistance of microorganisms can

be prevented with this prophylactic single-dose antibiotic. This prospective study confirms that one-time antibiotic prophylaxis had a positive effect on women undergoing a planned caesarean section.

#### 5. Source of funding

None.

#### 6. Conflict of interest

None.

#### References

- Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. CGuide for the prevention of surgical site infection, 1999. Consultative Committee on Hospital Infection Control Practices of the Centers for Disease Control and Prevention (CDC). *J Infect Control*. 1999;27:97–134.
- ACOG Committee on practice bulletins - Gynecology. ACOG Practice Bulletin No. 104: antibiotic prophylaxis for gynecological procedures. *Obstet Gynecol*. 2009;113:1180–1189.
- National Institute of Health and Clinical Excellence. 1.4.6.19-20: 2011. Review of the Clinical Guide (CG74) - Prevention and treatment of surgical site infection. ; 2011.
- Cunningham FG. Delivery by caesarean section and periparturient hysterectomy. In: Leveno KJ, Blum SL, Hout JS, 1 K Gilstrap, Venstrom KD, editors. *Obstetrics* William. McGraw Hill ; 2005. p. 588–604. 22th ed.
- Kamat AA, Brankazio L, Gibson M. Wound infection in gynecological surgery. *Infect Dis Obstet Gynecol*. 2000;8:230–234.
- McDonald M, Grabsch E, Marshall S, Forbes A. Antimicrobial prophylaxis of single or multiple doses for a large operation: a systematic review. *Aust N Z J Surg*. 1998;68:388–396.
- Lamont RF, Yu KD, Yu P. Current debate on the use of antibiotic prophylaxis for caesarean section. *Bjog*. 2011;118:193–201.
- Burke JF *Surg*. 1961;50:161–169.
- Liu S, Liston RM, Ks J, Heaman M, Sove R, Kramer MS. The Maternal Health Research Group of the Canadian Perinatal Observation System. Maternal mortality and severe morbidity are associated with a lower risk of caesarean section compared with planned full-term vaginal delivery. *CMAJ*. 2007;176(4):455–60.
- Harbart S, Zamora M, Kh, Lichtenberg D, Carmeli Y. Long-term antibiotic prophylaxis after cardiovascular surgery and its effect on infectious lesions and antimicrobial resistance. *Circulating*. 2000;101:2916–2937.
- Duff P, Park RC. Antibiotic prophylaxis for vaginal hysterectomy: a review. *Akushet Ginekol*. 1980;55:193–202.
- Tita A, Rouse DJ, Blackwell S, Saade GR, Cy S, Andrews WW. New concepts of caesarean section antibiotic prophylaxis: a systematic review. *Midwife Gynecol*. 2009;113(3):675–82.
- Cunningham FG, Leveno CJ, Blum SL, Hout DS, Gilstrap LK, Venstrom KD ; 2005.
- John A, Jones, Howard V. Antibiotic prophylaxis in elective gynecology. *Operating gynecology Te Linde*. 2003;p. 195–207. 9th edition.
- Schaberg DR. Gram-positive organisms are resistant. *Ann Emerg Med*. 1994;24(3):462–466.
- Schaberg DR, Culver DH, Gaines RP. The main directions of microbial etiology of nosocomial infection. *Im. J Med*. 1991;91(3B):72–77.
- Sadiche I, Abid S, Aliem S, Anwar S, Hafiz M, et al. Prevention of a single dose in obstetrics and gynecological surgery. *Chronicle*. 2009;15(4):176–185.
- Jabeen S, Rahim R. Single dose against multiple doses of cefradine as antibiotic prophylaxis for planned abdominal hysterectomy ; 2007.

19. Gonik B. Prevention of single-dose cefotaxime versus three doses for caesarean section. *Akushet Ginekol.* 1985;65(2):189–193.
20. Jabeen S, Rahim R. Single dose against multiple doses of cefradine as antibiotic prophylaxis for planned abdominal hysterectomy. *JPML.* 2007;21(1):50–54.
21. Gonik B. Prevention of a single injection of cefotaxime against three doses at caesarean section. *Akushet Ginekol.* 1985;65(2):189–193.
22. Shahin S, Akhtar S. Comparison of single doses with multiple doses of antibiotic prophylaxis for elective caesarean section. *J Postgraduate Med Inst.* 2014;28(1):83–89.
23. Mohan J. -. *Int J Reprod Contracept Obstet Gynecol.* 2017;6(9):3897–3902. Obstetrics and Gynecology.
24. McGregor JA, French JI, Macowski E. Single dose of cefotetan versus cefoxitin multidose for prevention of caesarean section in patients with high risk. I am. *J Obstet Gynecol.* 1986;154:955–60.

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