

ORIGINAL ARTICLE

ROLE OF PRE-CESAREAN SECTION CEFOTAXIME IN AMELIORATED POST-CESAREAN COMPLICATION

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ABSTRACT

The aim: The purpose of this study was to examine the efficacy of cefotaxime before and after skin incision in avoiding post-operative infection complications in caesarean section women, also evaluation the efficacy of cefotaxime in reducing post-caesarean section complications.

Materials and methods: We conducted 150 women who undergoing caesarean section in the Obstetrics & Gynecological Department, Babylon government from January, 2021 to March, 2021. The caesarean operations were done by using standard protocols. Each patient was examined daily and post-operative infectious. Women were randomly divided into three groups; each group contains 50 women; Group 1: (control) given normal saline 12 hr. before and after skin incision. Group 2 (pre-operation antibiotic): given single dose of cefotaxime 1 g intravenously 12 hr. before skin incision, and Group 3 (post-operation antibiotic): given single dose of cefotaxime 1 g intravenously 12 hr after operation.

Results: The outcome measures were post-operative febrile morbidity, healing period and urinary tract infections, in addition to socioeconomic state of each woman.

Conclusions: cefotaxime pre-caesarean section could ameliorate post-operative problems such as infection of surgical wound, febrile, and urinary tract infections.

KEY WORDS: cefotaxime, cesarean section, wound infection, surgical site infection, and post-operative febrile

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INTRODUCTION

Cesarean section SCs (laparotomy) is surgery to deliver a baby. The baby is taken out through the mother's abdomen, the first cesarean documented occurred in 1020 AD [1]. SCs are planned and sometime occur when there are unexpected delivery problems [2]. SCs were done when there are some reasons include health mother problems, multiple fetuses, abnormal size or position of the fetus, fetus health problem, and labor is not moving alone [3]. One of major risk factor for postpartum infection is Cesarean section. About 22% of live births in Western countries were by cesarean section and as compare the women that undergo cesarean section were 5–20 folds greater than normal vaginal birth Women [4]. Complications occur after cesarean such as Infection which consider as important factor for maternal damage and may cause elongation of hospitalization [5]. The procedure is relatively safe for both the mother and the infant. Nonetheless, it is a large operation with dangers. A C-section also takes longer to recover from than a vaginal birth. It can increase the chances of future pregnancies being challenging. Some women may have difficulty later attempting a vaginal birth. Despite this, many women are able to give birth vaginally following a cesarean section (VBAC) [6]. Every year, about 18.5 million cesarean sections are conducted around the world. Around 40% of countries have C-section rates of less than 10%, 10% have C-section rates of between 10% and 15%, and approximately 50% have C-section rates of

greater than 15% [7]. Since 1985, the international medical community has deemed a C-section rate of 10-15 percent to be desirable. C-sections have been more common in both developed and underdeveloped countries since then. Infection of the wound (common) – redness, swelling, growing discomfort, and drainage from the wound are all possible complications after caesarean section [8]. Fever, abdominal ache, irregular vaginal discharge, and excessive vaginal bleeding are frequent symptoms of infection of the uterine lining a lot of blood (uncommon). Deep vein thrombosis (DVT) is a clotting of the blood vessels in the legs (rare) a problem with your bladder or the tubes connecting your kidneys and bladder (rare) [9]. The main pregnancy hormones are estrogen and progesterone. Estrogen it is generated in the ovaries in most cases. The placenta also produces it throughout pregnancy to aid in the maintenance of a healthy pregnancy. During pregnancy, estrogen levels rise, allowing the uterus and placenta to function properly as transport nutrients, support the developing infant, and enhance vascularization (the creation of blood vessels) [10]. Estrogen is also thought to play a role in the development and maturation of the fetus. Estrogen levels rise gradually throughout pregnancy, peaking in the third trimester. Some of the nausea associated with pregnancy may be caused by the rapid increase in estrogen levels during the first trimester. It is important for the development of milk ducts, which enlarges the breasts, during the second trimester [11]. The state of fertilization

and development for one or more babies within a woman's uterus is known as pregnancy. Pregnancy is defined as the period of gestation that begins with the fertilization of an egg and ends with the birth of a child. As in the case of twins or triplets, a pregnancy might be many gestations. Childbirth normally happens at 38 weeks after conception, or around 40 weeks following the last normal menstrual cycle [12]. Pregnancy is split into three trimesters, each of which generally corresponds to a developmental stage. During the first trimester, the chance of spontaneous abortion (miscarriage) is higher, and it decreases in the second and third trimesters. During the second trimester, the fetus' growth and development may be more easily observed, but in the third trimester, a fetus is normally viable (though it may require medical intervention) [13]. Antimicrobials are frequently prescribed prophylactically in Obstetrics and Gynecology for pre and post-operative procedures caesarean section or to treat ongoing infection such as vaginitis, pelvic inflammatory, sexually transmitted diseases and urinary tract infections [14]. The appropriate use of antimicrobials in women of childbearing age is critical since it impacts both the women and their progeny. Antibiotics used randomly may result in the emergence of drug-resistant organisms [15]. The World Health Organization defines drug use as "the marketing, distribution, prescription, and use of pharmaceuticals in society, with a focus on the medical, social, and economic effects". A drug use study is one that aims to quantify and qualitatively describe the use of a certain drug, including the drug's class, indications, duration of treatment, dosage, preceding or concomitant therapies, and compliance [16]. Infections at the surgical site are a typical side effect of obstetric and gynecological treatments. Antimicrobial prophylaxis for caesarean section has been found to reduce postoperative morbidity, hospitalization costs, and length of stay. In the above scenario, antimicrobial use is unavoidable, but it should be limited. The proper administration of these treatments can help to avoid post-partum infection in both the mother and the baby, as well as lower the risk of unpleasant drug reactions. The goal of this study was to see how antimicrobials were used in 150 women who had a caesarean section [17]. When compared to women who give birth vaginally, women who have a caesarean section have a higher risk of infection. These infections can be transmitted by the urine, surgical incisions, or the womb lining (endometritis). Infections can be dangerous, resulting in a pelvic abscess or a blood infection, for example. They can, on rare occasions, result in the death of a mother, especially in low-resource circumstances. To prevent infection, good surgical methods, as well as the use of skin antiseptics and the administration of antibiotics prior to the caesarean section, are essential [18]. Cefotaxime (CLAFORAN) is a parenterally administered semisynthetic broad range cephalosporin antibiotic. It's a prescription medication that's used to treat symptoms of Gonococcal Urethritis or Cervicitis, Rectal Gonorrhoea, bacterial infections, and as surgical infection prevention. Cefotaxime can be taken alone or in combination with other drugs [19]. Cefotaxime

belongs to the Cephalosporin, 3rd Generation medication class. Depending on the concentration and diluents used, cefotaxime solutions range from very pale yellow to light amber. Cefotaxime can cause serious side effects such as hives, difficulty breathing, and swelling of the face, lips, tongue, or throat, severe stomach discomfort, watery or bloody diarrhea, skin rash, bruises, extreme tingling, and numbness. The state of fertilization and development for one or more babies within a woman's uterus is known as pregnancy. Pregnancy is defined as the period of gestation that begins with the fertilization of an egg and ends with the birth of a child. As in the case of twins or triplets, a pregnancy might be many gestations. Child birth normally happens at 38 weeks after conception, or around 40 weeks following the last normal menstrual cycle.

THE AIM

The purpose of this study was to examine the efficacy of cefotaxime before and after skin incision in avoiding post-operative infection complications in caesarean section women, also evaluation the efficacy of cefotaxime in reducing post-caesarean section complications.

MATERIALS AND METHODS

STUDY DESIGN

Our study was a conducted 150 women who undergoing elective caesarean section in the Obstetrics & Gynecological Department, Babylon government from 1/ 2021 to 3/ 2021. The caesarean operations were done by using standard protocols. Each patient was examined daily and post-operative infectious. Women were randomly divided into three groups with 50 women in each group. Group 1: (control) received normal saline 12 hr. before and after skin incision. Group 2 (pre-operation antibiotic): administered single dose of cefotaxime 1 g intravenously 12 hr. before skin incision, and Group 3 (post-operation antibiotic): administered single dose of cefotaxime 1 g intravenously 12 hr. after operation . The outcome measures were post-operative febrile morbidity, healing period and urinary tract infections, in addition to socioeconomic state of each woman.

FOLLOW UP PHASE

The follow up was performed in the next day after operation, Fever (temperature & recurrent > 38 C°). After two days, begin the other investigations such as UTI and wound infection. Tenth day post-operative, the patients come back to clinic obstetrician to examine the wound healing process, infections and other markers of study.

STATISTICAL ANALYSIS

We used mean \pm SEM to express the data and One-way ANOVA $P < 0.05$ followed by Tukey's post hoc to find the difference in means of temperature, healing period, and UTI

between different groups. The descriptive statistics of categorical variables were presented by counts and percentage. The association between age groups, Resident, Occupation, and education was analyzed by application of chi square (χ^2) test was used as appropriate at level of significance $\alpha = 0.05$. All statistical analyses were applied using SPSS 26.0 for Windows and the graphs were draw by GraphPad Prism software v8.0.2.

Table I. Demographics properties of the three groups P-value < 0.05

| Age | | |
|-------------------|-----------|---------|
| | Frequency | Percent |
| 20-30 years old | 84 | 56.0 |
| 31-40 years old | 48 | 32.0 |
| 41-50 years old | 18 | 12.0 |
| Total | 150 | 100.0 |
| Resident | | |
| Urban | 24 | 16.0 |
| countryside | 126 | 84.0 |
| | 150 | 100 |
| Occupation | | |
| Housewife | 75 | 50.0 |
| Employed | 75 | 50.0 |
| Total | 150 | 100.0 |
| Education | | |
| Read and write | 36 | 24.0 |
| Basic & Secondary | 63 | 42.0 |
| University | 51 | 34.0 |
| Total | 150 | 100.0 |

Table II. The fever degree in C° among the three groups (P < 0.05)

| Groups | Mean ± Std. Error | Std. Deviation | 95% Confidence Interval for Mean | |
|---------------------------|-------------------|----------------|----------------------------------|-------------|
| | | | Lower Bound | Upper Bound |
| Control (No antibiotic) | 38.062 ± 0.137 | 0.971 | 37.785 | 38.338 |
| Pre-operation antibiotic | 36.960 ± 0.125 | 0.884 | 36.708 | 37.211 |
| Post-operation antibiotic | 38.090 ± 0.113 | 0.801 | 37.862 | 38.317 |

Table III. Multiple Tuky Comparisons analysis among months

| Group | No antibiotic | Pre-operation antibiotic | Post-operation antibiotic |
|---------------------------|---------------|--------------------------|---------------------------|
| Control (No antibiotic) | | * | |
| Pre-operation antibiotic | * | | * |
| Post-operation antibiotic | | * | |

Results represent difference between means of months *significant difference (P < 0.05)

Table IV. Healing periods among the three groups (P < 0.05)

| Groups | Mean ± Std. Error | Std. Deviation | 95% Confidence Interval for Mean | |
|---------------------------|-------------------|----------------|----------------------------------|-------------|
| | | | Lower Bound | Upper Bound |
| Control (No antibiotic) | 2.3200 ± 0.1007 | 0.7125 | 2.1175 | 2.5225 |
| Pre-operation antibiotic | 1.7600 ± 0.110 | 0.884 | 1.5565 | 1.9635 |
| Post-operation antibiotic | 2.2800 ± 0.0634 | 0.776 | 2.0573 | 2.5027 |

RESULTS

DEMOGRAPHIC DATA

Table (I) was representing the demographic data of the three groups, we found that there is no significant difference ($p > 0.05$) between three groups in age, occupation, education, and residence.

TEMPERATURE

We noticed that the temperature was high in both control and post-operation antibiotic groups while the pre-operation antibiotic group showed low temperature. Also, we notice that there is insignificant difference ($p > 0.05$) between control group and post-operation group while there is significant difference ($p < 0.05$) between post-operation antibiotic group and both control and post-operation antibiotic groups, see tables (II), (III), and figure (1).

From this figure, it was noticed that the highest temperature was notices in control and post-operation groups while the lowest one was seen in pre-operation group.

HEALING PERIOD

We noticed that the healing period was long in both control and post-operation antibiotic groups, while the pre-operation antibiotic group showed short. Also, we notice that there is insignificant difference ($p > 0.05$) between control group and post-operation group while there is significant difference ($p < 0.05$) between post-operation antibiotic group and both control and post-operation antibiotic groups, see tables (IV), (V) and figure (2).

The longest period was notices in both control and post-operation groups while the shortest one was seen in pre-operation group.

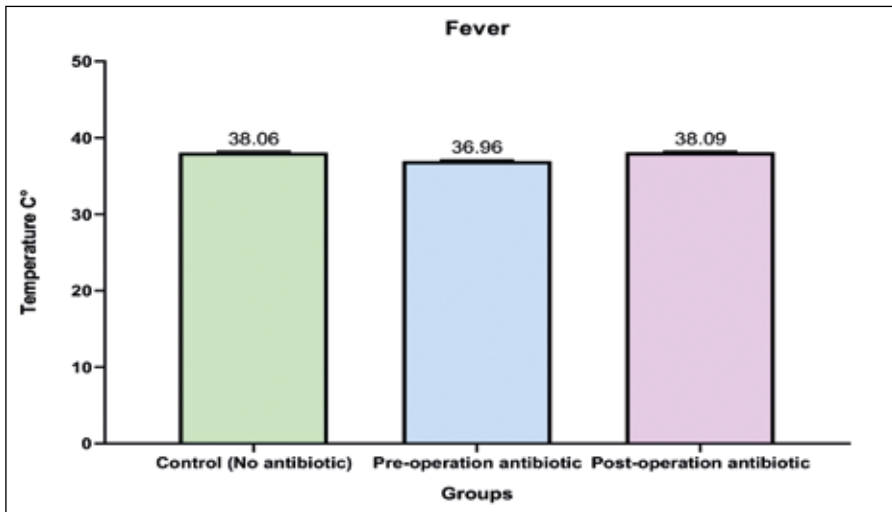


Fig. 1. The different in temperature among the three groups.

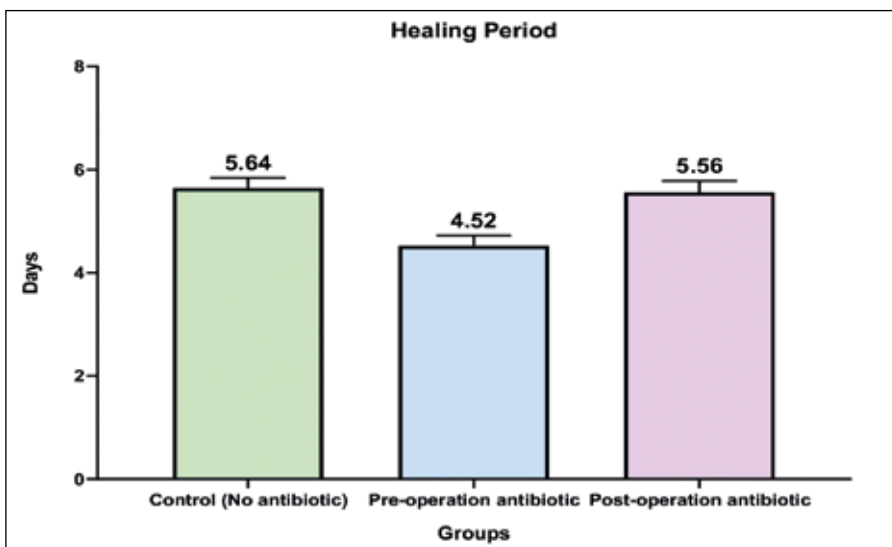


Fig. 2. The different in healing period among the three groups.

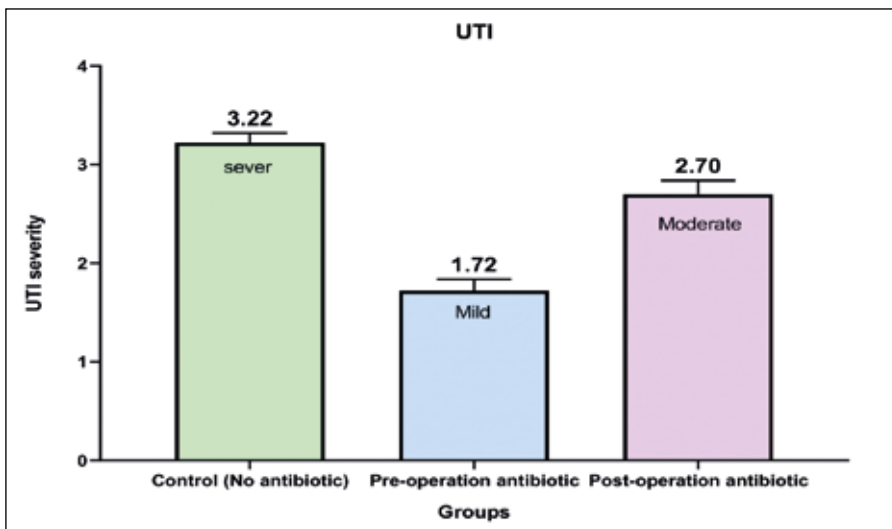


Fig. 3. The different in temperature among the three groups

URINARY TRACT INFECTION

We noticed that the UTI was sever in control and moderate in post-operation antibiotic groups while the pre-operation antibiotic group showed mild UTI. Also, we notice that there is significant difference ($p < 0.05$) between pre-opera-

tion antibiotic group and both control and post-operation antibiotic groups, see tables (VI), (VII) and figure (3).

The severity UTI was notices in control and moderate one in post-operation groups while in pre-operation group was mild.

Table V. Multiple Tukey Comparisons analysis among months

| Group | No antibiotic | Pre-operation antibiotic | Post-operation antibiotic |
|---------------------------|---------------|--------------------------|---------------------------|
| Control (No antibiotic) | | * | |
| Pre-operation antibiotic | * | | * |
| Post-operation antibiotic | | * | |

Results represents difference between means of months *significant difference (P < 0.05)

Table VI. The healing periods among the three groups (P < 0.05)

| Groups | Mean ± Std. Error | Std. Deviation | 95% Confidence Interval for Mean | |
|---------------------------|-------------------|----------------|----------------------------------|-------------|
| | | | Lower Bound | Upper Bound |
| Control (No antibiotic) | 3.220 ± 0.100 | 0.708 | 3.0187 | 3.4213 |
| Pre-operation antibiotic | 1.720 ± 0.117 | 0.884 | 1.4830 | 1.9570 |
| Post-operation antibiotic | 2.7000 ± 0.137 | 0.9741 | 2.4231 | 2.9769 |

Table VII. Multiple Tukey Comparisons analysis among months

| Group | No antibiotic | Pre-operation antibiotic | Post-operation antibiotic |
|---------------------------|---------------|--------------------------|---------------------------|
| Control (No antibiotic) | | * | * |
| Pre-operation antibiotic | * | | * |
| Post-operation antibiotic | * | * | |

Results represent difference between means of months *significant difference (P < 0.05)

DISCUSSION

In the absence of post-operative morbidity, Caesarean deliveries spend an average of two days in the ward. Those who have difficulties may need to stay on the island for up to twice as long abdominal wounds, as has been discovered in prior investigations. Endometriosis, infection, fever, and urinary tract infection are all symptoms of endometriosis. The most serious post-surgery complication any type of intervention. As a result, reducing these difficulties will hasten recovery as well as reducing the time of hospitalization. Maternal features in a statistically significant difference obstetrical history and contemporary obstetrical history are both important. According to the findings, the women 50% were housewives, and about 42% had basic skills and secondary education, also, we found the most of women were from country side regions. The majority of women, housewives who had cesarean sections, but she presented that countryside women made up the bulk of the population. In Sweden, [13] the authors found that the number of cesarean sections grew as women’s lives progressed in countryside regions. Antimicrobial prophylaxis is also suggested. All cesarean deliveries are advised, and these lead to minimize the occurrence of fever and endometriosis. The administration of perioperative cefotaxime during cesarean birth lowered the incidence of fever, urinary tract infection, and wound infection, according to our findings. These outcomes agree with [19], who came at the same conclusion prophylaxis given 12 hours before to cesarean delivery lowers the incidence of postpartum fever and wound infection infected. According to Hofmeyr et al. (2010), [14] using perioperative antibiotics reduced the risk of postpartum fever by 75%, also cefotaxime was given before antibiotics. The urinary tract infection and

postpartum fever were reduced as a result of the procedure infected. Kawakita T, et al., 2017 [20] came to a conclusion delivery of an antibiotics treatment with a broad breadth appears to be linked to a decrease in post-cesarean births infection in the mother.

CONCLUSIONS

Cefotaxime pre-cesarean section could ameliorate post-operative problems such as infection of surgical wound, febrile, and urinary tract infections.

RECOMMENDATIONS

It was suggested based on the findings of this investigation that introducing wound care education to the public. The nurse believes that mothers have an important part in wound healing. As a result; there should be some encouragement from the top. This measure should be followed by nurses and doctors to help reduce the number of deaths found infection caused by C.S. Antimicrobial prophylaxis is advised for all cesarean deliveries and that prophylaxis should be used given at least 30 minutes before the start of the event. Cesarean section is a surgical procedure that is used to deliver a baby, a single dosage for cesarean delivery prophylaxis. An antibiotic with a specific target, such as a first-generation cephalosporin is the first-line antibiotic of choice, unless significant drug allergies are present.

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