Single dose versus multiple day antibiotic prophylaxis for cesarean section: Randomized controlled trial

Thesis
Submitted for Partial Fulfillment for master degree in Obstetrics and Gynecology

Presented by
Eman Zenhom Mahmoud
M.B.B.Ch, Faculty of Medicine Ain Shams University, 2008

Under Supervision of

Prof. Dr. Mostafa Ibrahim Ibrahim
Professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Dr. Amr Ahmed Mahmoud Riad
Lecturer of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
Cairo – 2017

مقارنة جرعة واحدة من المضاد الحيوي الوقائي بعد الولادة القيصرية و جرعات يوم واحد متكررة المناطق الفقيرة لعينة عشوائية.

هذا العمل تم من اجل رسالة ماجستيرفي النساء و التوليد

بواسطة

ايمان زينهم محمود
بكالوريوس الطب و الجراحة- جامعة عين شمس
دفعة ديسمبر ٢٠٠٨
تحت إشراف

استاذ دكتور/ مصطفى إبراهيم
استاذ النساء و التوليد
كلية الطب
جامعة عين شمس

د/ عمرو أحمد محمد رياض
مدرس النساء و التوليد
كلية الطب
جامعة عين شمس
2017

List of Contents

\

List of tables

List of figures

Abstract

The most commonly performed major surgical procedure is cesarean section, as there is an increase in the incidence of cesarean delivery (CD) In current study we compare the efficacy of administration of prophylactic antibiotic single dose versus multiple day dose in reducing post-operative surgical site infection in women undergoing elective cesarean section**.** The study was conducted in Ain Shams University Maternity Hospital; Cairo during the period from December2015 to October 2016. This Study comprised 330 women undergoing elective cesarean delivery. Wound infection was the most common postpartum complication in both groups, The percentage of wound infection was less frequent in group B(control group) than group A(study group), but with no statistically significant difference(P. value=.925).There was no difference in both groups regarding post operative fever (p –value .285), endometritis, post operative UTI and hospital readmission.

Key words

Cost-benefit ratio should be in mind especially if the same efficacy was achieved by low cost regimen and dose.

There is a recommendation to extend the trial to parturient of high risk for infection.

It is important to emphasize that surgical antibiotic prophylaxis is an adjuvant to, not a substitute for, good surgical technique.

Abstract

The most commonly performed major surgical procedure is cesarean section, as there is an increase in the incidence of cesarean delivery (CD) In current study we compare the efficacy of administration of prophylactic antibiotic single dose versus multiple day dose in reducing post-operative surgical site infection in women undergoing elective cesarean section**.** The study was conducted in Ain Shams University Maternity Hospital; Cairo during the period from December2015 to October 2016. This Study comprised 330 women undergoing elective cesarean delivery. Wound infection was the most common postpartum complication in both groups, The percentage of wound infection was less frequent in group B(control group) than group A(study group), but with no statistically significant difference(P. value=.925).There was no difference in both groups regarding post operative fever (p –value .285), endometritis, post operative UTI and hospital readmission.

Key words

Cost-benefit ratio should be in mind especially if the same efficacy was achieved by low cost regimen and dose.

There is a recommendation to extend the trial to parturient of high risk for infection.

It is important to emphasize that surgical antibiotic prophylaxis is an adjuvant to, not a substitute for, good surgical technique.

Introduction

The most commonly performed major surgical procedure is cesarean section, as there is an increase in the incidence of cesarean delivery (CD) ***(De Frances et al., 2007).***

The percent of cesarean delivery up till now is 31% of births that could reach 50% by 2020 ***(Lamont et al., 2010).***

All over the world, infection and the complications of sepsis are among the most common causes of severe maternal morbidity and mortality. ***(Centre for Maternal and Child Enquiries (CMACE), 2011).***

Risk factors for the development of maternal sepsis include home birth in unhygienic conditions, low socioeconomic class, bad nutrition, anemia, prolonged rupture of membranes, prolonged labor, multiple vaginal examinations in labor (more than five), caesarean section, artificial reproductive techniques, obesity and obstetrical maneuvers ***(Kramer et al., 2009 and Maharaj, 2007).*** However, the single most important risk factor for postpartum infection seems to be caesarean section, ***(Smaill and Gyte, 2010).***

Postpartum infection associated with cesarean delivery is the most important factor and it carries a 5 to 20-fold increased risk of infection compared with vaginal delivery ***(Bagratee et al., 2001).***

The infection rate following CD is 1.1–25% compared with 0.2–5.5% following vaginal birth ***(Barwolff et al., 2006)***

Infection rate following to emergency and elective CD vary between 7.5 to 29.8% and between 5.5 to 17.3%, respectively ***(Ward et al., 2008).***

Complications of infection following cesarean birth include fever, wound infection, endometritis, and urinary tract infection. There can also occasionally be serious infectious complications including pelvic abscess, bacteremia, septic shock, necrotizing fasciitis and septic pelvic vein thrombophlebitis, resulting in major financial burdens and maternal mortality ***(Smail and Gyte, 2010).***

The most common infection-related complication following cesarean delivery is wound infection, which can be reduced by the use of prophylactic antibiotics ***(Hofmeyr and Smaill and Gyte, 2010).***

When surgical wound infections lead to the administration of more antibiotics, an increase in the cost of

care, and ‘prolongation of hospital stay, the aim of antibiotic prophylaxis is to prevent or at least decrease the incidence of postoperative wound infections ***(Antimicrobial prophylaxis for surgery, 2004).***

The use of prophylactic antibiotics in women undergoing cesarean delivery substantially decreased the incidence of febrile morbidity ***(Smaill and Gyte, 2010).***

Hence, prophylactic antibiotics decrease surgical site infections and it is recommended to be administrated prior to surgical incision ***(Osman et al., 2013).***

While antibiotic prophylaxis should be taken to perform adequate serum and tissue drug levels for the interval during which the surgical site is open, for most adults it is acceptable to dose antimicrobials based on standardized doses for safety, efficacy, and convenience ***(Anderson and Sexton, 2013***

Cefazolin (first generation cephalosporin) has been recommended as the regimen of choice for prophylactic antibiotic in cesarean delivery because of raising microbial resistance ***(American College of Obstetricians and Gynecologists, 2003).***

However, the 2nd or 3rd generation cephalosporins have been established as prophylactic antibiotic in cesarean

delivery with encouraging results ***(Hopkins and Smaill, 2012).***

An excellent profile against surgical infecting organisms is third generation cephalosporin (***Aldridge, 2002).***

In a 2010 systematic review, cefazolin and Ampicillin appeared to be having similar effect ***(Alfirevic et al., 2010).***

The recommendation of an antimicrobial is determined primarily by efficacy and secondarily by cost. Because of fluctuation in cost from one health system to another, health systems must tailor the choice of antimicrobials to their individual acquision costs ***(American society of health system pharmacists. ASHP, 1999*).**

Aim of the Work

To compare the efficacy of administration of prophylactic antibiotic single dose versus multiple day dose in reducing post-operative surgical site infection in women undergoing elective cesarean section**.**

Cesarean Section

History of the operation:

The beginning of the term "cesarean" is not entirely clear. It is unlikely that Julius Caesar was born by abdominal delivery, as this was almost universally fatal for the parturient during that era and Caesar's mother is known to have survived his birth ***(Sewell, 1993)***.

Another possible origin of the term is the Latin verb caedere, which means "to cut". Others think that the term originated from the Roman custom, Lex Cesare, which mandated postmortem operative delivery when mothers died during childbirth; so that mother and child could be buried separately "cesarean section" is also a matter of discussion ***(Sewell, 1993)***.

Epidemiology:

Incidence:

The percent of cesarean delivery right now is 31% of births which could reach 50% by 2020 ***(Lamont; et al., 2010***)