Efficacy of Adding Azithromycin to Cephalosporin for the Prophylaxis Against Infectious Morbidity Following Cesarean Delivery in high risk women: Randomized Controlled Trial

Thesis

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Ghada Fayed Hashem El-Sharkawy

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List of Abbreviations

Abb.	Full term
AUC	Area under curve
AV node	Atrioventricular node
CMACE	Confidential enquiry in maternal deaths
CMV	Cytomegalovirus
CT	Computed tomography
CTG	Continuous cardiotocography
DIC	Disseminated intravascular coagulation
Factor V	Nicotinamide-adenine-dinucleotide, NAD
GBS	Group B streptococcus
HbA1c	Glycated hemoglobin
ICD	International classification of diseases
INR	International normalized ratio
IOL	Induction of labour
IQR	Inter quartile range
ITP	Idiopathic thrombocytopenic purpura
IU	International unit
IUFD	Intrauterine fetal death
OC	Obstetric cholestasis
PAM	Peptidylglycinealpha-amidating monooxygenase
Protein C	Autoprothrombin IIA and blood coagulation factor XIV
Protein S	Vitamin K-dependent plasma coagulation proteins
PT	Prothrombin time
PTT	Partial thromboplastin time

List of Abbreviations Cont...

Abb.	Full term
QT	Q wave and the end of the T wave
RH	Redirects here
ROC	Receiver operating characteristics
SCRN	Stroke Certified Registered Nurse
SLE	Systemic lupus erythematosus
SPSS	Statistical package for social science
US	Ultrasound
WHO	World Health Organization

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INTRODUCTION

Cesarean delivery is one of the commonly performed surgical procedures in obstetrics. Cesarean rates in Egypt rose from 4.6% to 51.8% over the 24 years period from 1990 till 2014, ***(Ministry of Health and Population [EGYPT], 2014)***.

Therefore it is associated with higher rates of maternal infection, re-hospitalization and postpartum medical care utilization ***(Izveren et al., 2011)***.

There are several recommendations for prophylaxis against infectious morbidity following cesarean delivery which include:

1. Hair removal before skin incision.

2. Skin cleansing with antiseptics.

3. Antibiotic prophylaxis ***(Duff, 2016)***

Current recommendations for antibiotic prophylaxis in cesarean delivery include standard use of narrow spectrum antibiotic administered 30-60 mins before skin incision ***(ACOG, 2011).***

Recently multicenter, randomized trials found that there were fewer cases of endometritis and wound infection among laboring women who received adjunctive azithromycin 2 hours

before skin incision compared with active control (all received a cephalosporin) ***(Tila, 2016).***

Azithromycin is a bacteriostatic macrolide antibiotic and like other macrolides inhibits synthesis of protein by binding reversibly to 50s ribosomal subunits of sensitive microorganisms, at or very close to the site that binds chloramphenicol. It does not inhibit peptide bond formation *per se*, but rather inhibit the translocation step where a recently formed peptidyl + RNA travels from the acceptor site on the ribosome to the peptidyl donor site (NIPA) ***(Lovmar, 2005).***

AIM OF THE WORK

General objective:

To investigate the efficacy of adding azithromycin to cephalosporin for the prophylaxis against wound infection which is considered primary outcome, endometritis, respiratory tract infection and urinary tract infection being secondary outcomes following cesarean delivery in high risk women.

Chapter 1

CESAREAN SECTION

Cesarean delivery (also called cesarean section and cesarean birth) is often cited as the most common major surgical procedure performed in an operating room in the United States ***(Pfuntner et al., 2013).***

Over 1.2 million cesarean deliveries are performed yearly in the United States and comprise almost one-third of births ***(CDC, 2017).***

It is also a common procedure in many countries worldwide, and the rate is generally rising ***(Boerma et al., 2018).***

Concerns about the rising rate has prompted medical organizations to suggest potential interventions to reduce the rate of unnecessary procedures, such as better childbirth preparation, second opinion before a cesarean, broader midwifery-led care, more trials of labor after a cesarean, continuous labor support, and changes in current financial incentives/disincentives ***(WHO, 2018).***

Indications:

Cesarean delivery is performed when the clinician and/or patient believe that abdominal delivery is likely to provide a

better maternal and/or fetal outcome than vaginal delivery. Thus, indications for cesarean delivery fall into two general categories: ***(Boyle et al., 2013)***

- Medically/obstetrically indicated, or
- On maternal request

Approximately 70 percent of cesarean deliveries in the United States are primary (first) cesareans. The three most common indications for primary cesarean delivery in the United States account for almost 80 percent of these deliveries: ***(Boyle et al., 2013)***

- Failure to progress during labor (35 percent).
- Nonreassuring fetal status (24 percent).
- Fetal malpresentation (19 percent).

Additionally, less common indications for primary cesarean delivery include, but are not limited to: ***(Boyle et al., 2013)***

- Abnormal placentation (eg, placenta previa, vasa previa, placenta accreta).
- Maternal infection with significant risk of perinatal transmission during vaginal birth.
- Some fetal bleeding diatheses.

- Cord prolapse.
- Suspected macrosomia (typically 5000 grams in women without diabetes, 4500 grams in women with diabetes).
- Mechanical obstruction to vaginal birth (eg, large fibroid, severely displaced pelvic fracture, severe fetal hydrocephalus).
- Uterine rupture.
- Prior uterine surgery that entered the endometrial cavity, such as myomectomy.

Although infrequent, cesarean delivery is also indicated in women who are at increased risk for complications/injury from cervical dilation, descent and expulsion of the fetus, or episiotomy. Some examples include women with invasive cervical cancer, active perianal inflammatory bowel disease, or history of repair of a rectovaginal fistula or pelvic organ prolapse. Cesarean delivery is not routinely indicated for low birth weight and most congenital anomalies ***(Boyle et al., 2013).***

Contraindications:

There are no absolute contraindications to cesarean delivery. In contrast to other types of surgery, the risks and benefits of the procedure are considered as they apply to two patients (mother and fetus). However, many pregnant women have a low tolerance for accepting any fetal risk from vaginal

birth, irrespective of the maternal risks associated with cesarean delivery. ***(Lyerly et al., 2007)***

Preoperative planning:

Checklists: Checklists can be helpful in preoperative planning and are available from various organizations, such as the American College of Obstetricians and Gynecologists (ACOG) (eg, patient safety checklists for preoperative planning and scheduling) ***(ACOG, 2011).***

Scheduling:

Medically or obstetrically indicated procedures: Medically/obstetrically indicated cesarean deliveries are scheduled when clinically indicated.

When a primary cesarean delivery is indicated for maternal or fetal reasons, but preterm birth is not indicated, there is consensus that planned term cesarean delivery should be scheduled in the 39th or 40th week of gestation. We caution against performing early term (in the 37th or 38th week of gestation) cesareans when the medical/obstetrical indication for delivery is "soft," such as a history of fetal, maternal, or obstetric complication in a previous pregnancy that has not recurred ***(ACOG, 2017).***

In suboptimally dated pregnancies, scheduling should be based on the best clinical estimate of gestational age.