Vaginal Preparation with Povidone Iodine versus Chlorhexidine before Cesarean Section for Preventing Postoperative Endometritis

Thesis
Submitted for Partial Fulfillment of the Master Degree in Obstetrics & Gynecology

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Faculty of Medicine
Ain Shams University
2015
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List of Abbreviations

BMI : Body mass index
CBC : Complete blood count
CI  : Confidence interval
ER  : Emergency Room
GAS : Group A streptococcus (GAS)
HIV : Human immunodeficiency virus
OPC : Outpatient clinic
RR  : Relative risk
SPSS: Statistical Package for social science
WHO : World Health Organization
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Acknowledgement

I would like to express my sincere gratitude to Prof. Dr. Hassan Tawfek Khairy, Professor of Obstetrics & Gynecology, Faculty of Medicine – Ain Shams University, who has so kindly supervised my thesis, I have the honor to complete this work under his supervision.

I wish also to express my gratitude to Prof. Dr. Ahmed Mohammed Ibrahim, Professor of Obstetrics & Gynecology, Faculty of Medicine – Ain Shams University, I am deeply grateful to him for his professional advice, his guidance and support.

I am also grateful to Dr. Sherif Hanafi Hussain, Assistant professor of Obstetrics & Gynecology, Faculty of Medicine – Ain Shams University, for his great efforts and time he had devoted in this work.

I can’t forget to thank all members of Infection Control Committee, Ain Shams Maternity Hospital for their cooperation and help during the whole work.

Last but not least I’m grateful to all members of my Family, especially my Parents and my Husband for pushing me forward in every step in my life.

Asmaa Fahmy Kasem
Introduction

Cesarean delivery is one of the most common surgical procedures performed by obstetricians. Infectious morbidity after cesarean delivery can have a tremendous impact on the postpartum woman's return to normal function and her ability to care for her baby. Despite the widespread use of prophylactic antibiotics, postoperative infectious morbidity still complicates cesarean deliveries (Haas et al., 2013).

Endometritis, an infection of the uterus in the postpartum period, can complicate the postoperative course of a cesarean delivery 6% to 27% of the time (Smaill and Hofmeyr, 2002). This complication, up to 10 times more frequent after a cesarean delivery than after vaginal delivery, can lead to serious complications of bacterial infection in the blood (10% to 20%), peritonitis, intra-abdominal abscess and sepsis (French and Smaill, 2004; Yokoe, 2001).

Additionally, cesarean deliveries are frequently complicated by maternal fever and wound complications including seroma, hematoma, infection, and separation. These morbidities can lead to significant delay in a return to normal function (Chongsuvivatwong et al., 2010).
Post-cesarean endometritis and infectious morbidity are the result often of the presence of bacteria in the vagina and cervix that move higher in the genital tract to infect the uterus. These bacteria have been shown to be responsible for failure of antibiotic prophylaxis during cesarean deliveries (Watts et al., 1991).

Additionally, some antibiotics do not consistently eradicate some bacteria (such as enterococcus) and the vagina has been shown to become colonized with antibiotic-resistant bacteria after pre-operative surgical antibiotic prophylaxis (Graham et al., 1993).

Currently, it is standard care to give antibiotics to women receiving a cesarean delivery, but the rate of post-cesarean infections remains a problem (Haas et al., 2013).

Vaginal preparation with povidone-iodine solution immediately before cesarean delivery reduces the risk of postoperative endometritis. This benefit is particularly realized for women undergoing cesarean delivery with ruptured membranes. As a simple, generally inexpensive intervention, providers should consider implementing preoperative vaginal cleansing with povidone-iodine before performing cesarean deliveries (Hass et al., 2013).
Chlorhexidine is a broad-spectrum antiseptic that has been used extensively for many decades in hospital and other clinical settings. It has also been given as maternal vaginal lavage, full-body newborn skin cleansing, and/or umbilical cord cleansing to prevent infection in neonates (Lumbiganon et al., 2004).

Chlorhexidine gluconate was more effective than povidone iodine in decreasing the bacterial colony counts that were found in the operative field for vaginal hysterectomy (Culligan et al., 2003).
Aim of the Work

Research question:
In ladies undergoing elective Caesarean section, Is immediate preoperative vaginal preparation with Chlorhexidine superior to preoperative vaginal preparation with Povidone Iodine as regard decreasing rate of postoperative endometritis?

Research hypothesis:
Vaginal preparation with chlorhexidine solution immediately before cesarean section is superior to that with povidone iodine as regard decreasing rate of postoperative endometritis.

Outcome:
Postoperative endometritis defined as a clinical diagnosis, usually involving fever (above 38°C beyond the first 24 hours postoperative), uterine fundal tenderness, and purulent lochia requiring antibiotic therapy.
Chapter (1):
Endometritis

Introduction:

Postpartum endometritis refers to infection of the decidua (ie, pregnancy endometrium). The infection may also extend into the myometrium (called endomyometritis) or involve the parametrium (called parametritis) (Adair, 1935).

Postpartum endometritis is a common cause of postpartum febrile morbidity. The United States Joint Commission on Maternal Welfare defines postpartum febrile morbidity as an oral temperature of $\geq 38.0$ degrees Celsius ($\geq 100.4$ degrees Fahrenheit) on any 2 of the first 10 days postpartum, exclusive of the first 24 hours. The first 24 hours are excluded because low grade fever during this period is common and often resolves spontaneously, especially after vaginal birth (Fliker and Monif, 1979).

Microbiology:

Postpartum endometritis is typically a polymicrobial infection involving a mixture of two to three aerobes and anaerobes from the genital tract. This was illustrated in a study of 55 women with well-defined puerperal endometritis who had endometrial cultures obtained with a triple-lumen catheter to reduce the risk of contamination from organisms
on the cervix (Rosen et al., 1986). None of the women had received prophylactic antibiotics. More than one organism was recovered from 70 percent of these women; approximately 60 percent of the isolates were facultative gram positive and gram negative bacteria, approximately 40 percent were anaerobes, and 30 percent were mycoplasmas.

Although mycoplasmas are often isolated from the endometrial cavity, antibiotic therapy is not usually required for clinical cure in women who have Ureaplasma urealyticum only, without additional organisms. Thus, the role of mycoplasmas in the pathogenesis of endometritis is unclear (Patai et al., 2005).

Sexually transmitted infections, such as Neisseria gonorrhoeae and Chlamydia trachomatis, are uncommon causes of postpartum endometritis, but common causes of endometritis unrelated to pregnancy. Chlamydia trachomatis appears to be more prevalent in patients with late onset of symptoms (two or more weeks after delivery), but data are limited (Ismail et al., 1987).

In HIV infected women, the microbiology can be broader and include other less likely pathogens, such as herpes simplex virus and cytomegalovirus (Giraldo-Isaza et al., 2011).

Rare, but potentially lethal causes of endometritis include clostridium sordellii (Aldape et al., 2006), clostridium
perfringens (Cohen et al., 2007) and streptococcal or staphylococcal toxic shock syndrome (Jorup-Ronstrom et al., 1996).

RISK FACTORS:

Cesarean delivery is the most important risk factor for development of postpartum endometritis, especially when performed after the onset of labor (Declercq et al., 2007). Among women who receive antibiotic prophylaxis, which has become standard practice, the frequency of postpartum endometritis is 11 percent for cesareans performed after the onset of labor and 1.7 percent for those performed electively (without antibiotic prophylaxis, the risks are 28 and 3.5 percent, respectively) (Smail and Gyte, 2010). The frequency of postpartum endometritis after vaginal birth is less than 3 percent (Burrows et al., 2004).

Bacterial vaginosis is an important pathogen in the setting of cesarean delivery (Soper, 1993). In a multivariable analysis, the presence of bacterial vaginosis significantly increased the risk of developing postcesarean endometritis (OR 5.8, 95% CI 3.0-10.9) after adjusting for duration of labor, duration of membrane rupture, and maternal age (Watts et al., 1993). The propensity to upper genital tract infection in women with bacterial vaginosis may be related to