RECTAL MISOPROSTOL BEFORE CESAREAN SECTION TO REDUCE THE RISK OF INTRA- AND POST-OPERATIVE BLOOD LOSS

Thesis

Submitted for Partial Fulfillment of Master Degree in Obstetrics and Gynecology

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2012

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List of Abbreviations

%	: Percentage
µg	: Microgram
AMTSL	: Active management of third stage of labour
AUC	: Area under the serum concentration versus time
C	: Carbon
C/S	: Cesarean section
Cmax	: Peak concentration Curve
dL	: Deciliter
FDA	: Food and Drug Administration
FIGO	: International Federation of Gynecology and Obstetric
g	: Gram
HB	: Hemoglobin
HCT	: Hematocrit
IM	: Intramuscular
IU	: International Unit
IUFD	: Intrauterine fetal death
IV	: Intravenous
L	: Liter
Mg	: Milligram
Min	: Minutes
mL	: Milliliter
NS	: Non significant
NSAID	: Non-steroidal anti –inflammatory drugs
PGEI	: Prostaglandin E1
PPH	: Postpartum hemorrhage
S	: Significant
SD	: Standard Deviation
Tmax	: The time to peak concentration
VS	: versus
WHO	: World Health Organization
CHW	: Community Health Worker

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Acknowledgement

*First, thanks are directed to **ALLAH** for blessing this work until it has reached its end, as a part of generous help throughout my life.*

*No words can express my deepest appreciation and profound respect to **Prof. Mourad Mohie El-Din El-Said,** Professor of Obstetrics and Gynecology, Faculty of Medicine–Ain shams University, his unlimited support, valuable observation and kind help throughout this work.*

*Much thanks also is dedicated to **Dr. Mohamed Samir Sweed,** Lecturer of Obstetrics and Gynecology, Faculty of Medicine –Ain shams University, for his continuous supervision, support and patience, and patients, residents and all unit for their co-operation.*

*I would like to thank all my **Family** members, my **Mother**, my **Father**and my **Brothers** for there unlimited support.*

Reham Mohamed Eltrabily

﴿ قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ ﴾

صدق الله العظيم

سورة البقرة آية (٣٢)

INTRODUCTION

Postpartum haemorrhage is a major cause of morbidity and mortality both in developed and in developing countries *(Villar et al., 2002).*

The World Health Organization (WHO) defines postpartum haemorrhage as blood loss of 500 ml or more. The diagnosis is based on a clinical estimate of blood loss. The WHO states that the loss of 500 ml of blood should be considered an alert, after which the health of the woman may be endangered *(WHO, 1996).*

In Bergholt's retrospective review of almost 1000 cesareans, estimated blood loss of greater than 1000 ml was recorded in 9.2% of cesarean births, with 1% of women requiring blood transfusion. These rates were similar for both elective and emergency births *(Bergholt et al., 2003).*

Each year, worldwide, about 536,000 women die from causes related to pregnancy and childbirth. Almost all (99%) of the deaths are in low and middle income countries *(WHO, 2007).*

Haemorrhage is also an important cause of maternal mortality in high income countries, accounting for about 13% of maternal death *(Khan et al., 2006).*

In many parts of the world, the loss of 500 ml of blood can be a serious threat to health due to the high prevalence of severe anaemia. Severe anaemia is a common consequence of postpartum bleeding and affects about 11% of the 14 million women with postpartum haemorrhage each year *(AbouZahr, 2003).*

The main causes of postpartum haemorrhage are uterine atony, trauma to the genital tract during delivery and retained placenta *(McCormick, 2002).*

Risk factors for postpartum haemorrhage include primiparity, prolonged or augmented labor, multiple births, polyhydramnios, anaesthesia, macrosomia, obesity, and placental abruption. Nevertheless, the majority of women with postpartum haemorrhage have low-risk pregnancies *(Bergholt et al., 2003).*

The treatment of postpartum haemorrhage may include drugs to increase uterine contractility, volume replacement for blood loss, and various surgical procedures including uterine compression sutures, arterial ligation, selective artery embolisation, intrauterine tamponade and hysterectomy *(Lalonde et al., 2006).*

AIM OF THE WORK

To evaluate the effect of preoperative administration of 400 µg misoprostol rectally in reduction and prevention of both intra-operative and postpartum blood loss.

Chapter (1)

POSTPARTUM HAEMORRHAGE

Postpartum haemorrhage is the loss of greater than 500 ml of blood following vaginal delivery, or 1000 ml of blood following section *(Anderson and Etches, 2007).* A loss of these amounts within 24 hours of delivery is termed early or primary, where as such losses are termed late or secondary if they occur 24 hours after delivery *(Rizvi et al., 2004).*

A more accurate definition of postpartum haemorrhage is any blood loss that causes a physiological change (e.g. low blood pressure) that threatens the woman's life *(McCormick et al., 2002).*

The prevalence rate of postpartum haemorrhage of more than 500 ml is approximately 5% when active management is used versus 13% when expectant management is used. The prevalence rate of postpartum haemorrhage more than 1000 ml is approximately 1% when active management is used versus 3% when expectant management is used *(Chong et al., 2004a).*

Aetiology

Significant risk factors for postpartum haemorrhage include *Chorioamnionitis,* an over distended uterus and a third stage of labor more than 10 min *(Magann et al., 2008).*

Postpartum haemorrhage has many potential causes, but the most common, by a wide margin, is uterine atony. Effective homeostasis after separation of the placenta is dependent on contraction of the myometrium to compress several vessels *(Cunningham et al., 2001).*

As a way of remembering the cause of postpartum haemorrhage, several sources have suggested using the "4T's" as a mnemonic: Tone, Tissue, Trauma and Thrombosis *(Society of Obstetricians and Gynecologists of Canada, 2002).*

1-Tone:

Uterine atony and failure of contraction and retraction of myometrial muscle fibers can lead to rapid and severe haemorrhage and hypovolemic shock. Overdistension of the uterus, either absolute or relative, is a major risk factor for atony, It can be caused by multifetal gestation, fetal macrosomia, polyhydramnios, fetal abnormality (e.g., severe hydrocephalus), a uterine structural abnormality or a failure to deliver the placenta or distension with blood before or after placental delivery poor myometrial contraction can result from fatigue due to prolonged labor or rapid forceful labor, especially if stimulated. It can also result

from the inhibition of contractions by drugs such as halogenated anaesthetic agents, nitrates, non-steriodal anti-inflammatory drugs, magnesium sulfate, beta-sympathomimetics and nifedipine *(Smith and Brennan, 2004).*

Predisposing factors to uterine atony include:

1. Grand multiparity

The risk of postpartum haemorrhage in advanced maternal age (over 35 years) and grand multiparity (para 5 and over) was twofold higher than low maternal age (<25 years) and low parity *(Ijaiya et al., 2003).*

2. Over distension of the uterus

According to Starling's law within limits the developed tensions, is directly proportional to the initial length of the muscle fiber. If the muscle is stretched, its initial length is increased and the developed tension is also increased. If the muscle is over stretched the muscle contractions become weaker. Over distension of the uterus by multiple pregnancy, hydramnios or large fetus leads to elongation of muscle fibers which will need time to accommodate themselves to the rapidly diminishing uterine volume at delivery, the sudden emptying of the distended uterus often predisposes to hemorrhage *(Cunningham et al., 2001).*

Multiple pregnancies; however comes the next most important predisposing factor. In twin pregnancy, besides lacking in retractile power, the most important is double placenta where the placental site is greatly increased so bleeding is doubly profuse *(Cunningham et al., 2001).*

3. Antepartum haemorrhage

Placenta previa and abruption placenta are often causes of postpartum haemorrhage which is aggravated by antecedent bleeding and is paradox that one of the commonest causes of death in antepartum hemorrhage is postpartum haemorrhage *(Cunningham et al., 2001).*

In placenta previa, the lower uterine segment is more prone to contract poorly than in the uterine body; leading to the increased frequency of postpartum haemorrhage. Bleeding may also result from lacerations in the friable cervix and lower uterine segment, especially following manual removal of a somewhat adherent placenta *(Cunningham et al., 2001).*

4. Prolonged labor

Uterine exhaustion following prolonged labor is one of the principal causes of postpartum haemorrhage. The effects of hemorrhage are more pronounced because the patient is already dehydrated *(Cunningham et al., 2001).*

WHO defines prolonged labor as labor lasting more than 12 hours after cervical dilatation has reached 3 cm (active labor) in spite of good uterine contractions *(Bang et al., 2004).*

5. Precipitate labor

Precipitate labor defined as labor that terminates in expulsion of the fetus in less than 3 hours *(Cunningham et al., 2005).*

6. Anaesthetic agents

The incidence of women with cesarean PPH with general anaesthesia as fluthane are approximately 8.15 times higher than for women who undergo cesarean section with epidural anaesthesia *(Chang et al., 2011).*

7. General debilitating diseases

For effective contraction to be maintained, it is necessary to have an adequate supply of oxygen and fuel to support the aerobic metabolism of myometrial cells *(Arias, 1993).*

8. Use of oxytocin

Labor either initiated or augmented with oxytocin is more likely to be followed by postpartum uterine atony and haemorrhage *(Cunningham et al., 2005).*