

of Intravenous Tranexamic Acid in Reducing Blood Loss during Cesarean Section

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List of Abbreviations

ACOG	: American college for obstetricians gynecologists.
aPTT	: Activated partial thromboplastin time.
BMI	: Body Mass Index.
CBC	: Complete Blood Count.
CMACE	: Centre for Maternal and Child Enquiries.
CVP	: Central Venous Pressure.
DIC	: Disseminated Intravascular Coagulopathy.
GCS	: Glasgow coma score.
Gm	: Gram.
HB	: Hemoglobin.
HCT	: Hematocrite.
HELLP	: Hemolysis, Elevated liver enzyme levels, and Low platelets level.
ICM	: International Confederation of Midwives.
Im	: Intramuscular.
Iu	: International unit.
Iv	: Intravenous.
LGA	: Large for gestational age.
Mcg	: Microgram.
Mg	: Milligram.
Min	: Minute.
ml	: Milliliter.
MRI	: Magnetic Resonance Imaging.
MRSA	: Methicillin resistant staph aureus.
NSAIDS	: Non Steroidal Anti-inflammatory Drugs.
PAIS	: Plasminogen Inhibitors.
PAS	: Plasminogen Activators.
PGE2	: Prostaglandin E2.
PPH	: Post Partum Hemorrhage.
PT	: Prothrombin Time.

List of Abbreviations(Cont.)

RCO	:	Royal College of Obstetrics and Gynecology.
RCOG	:	RoyalCollege for Obstetricians and Gynecologists.
RCT	:	Randomized Controlled Trial.
TPA	:	Tissue Plasminogen Activator.
TXA	:	Tranexamic Acid.
VBAC	:	Vaginal birth after cesarean section.
WHO	:	World health organization.
WOMAN	:	World Maternal Anti-fibrinolytic Trial.

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Introduction

Cesarean section (C.S) is the delivery of a baby through a surgical abdominal incision (*Jose et al., 2003*).

Delivery by CS can cause more complications than normal vaginal delivery. There is more blood loss in a cesarean delivery than with a vaginal delivery. This can lead to anemia or a blood transfusion (1 to 6 women per 100 require a blood transfusion). Possible injury to organs such as the bowel or bladder. Infection can occur at the incision site, in the uterus and in other pelvic organs such as the bladder. Scar tissue may form inside the pelvic region causing blockage and pain. Adhesions can also lead to future pregnancy complications such as placenta previa or placental abruption. Extended hospital stay and recovery time. There can be a negative reaction to the anesthesia given during cesarean or negative reaction to pain medication given after the procedure. Risk of additional surgeries: Includes possible hysterectomy, bladder repair or another cesarean. Risks and complications for the baby e.g; premature birth breathing problems, low APGAR scores and fetal injury may occur (*American Pregnancy Association, 2013*).

One of the most common complication is postpartum hemorrhage (20%). It leads to increased maternal mortality and morbidity. It causes approximately 25% of maternal deaths worldwide (*WHO Recommendations 2006*) and 12% of survivors will have severe anemia (*Nour, N.M, 2008*).

In order to reduce maternal mortality and morbidity caused by bleeding, it is important to reduce the amount of bleeding during and after lower segment cesarean section (LSCS) **(Singh et al., 2014)**.

Medications, such as oxytocin, misoprostol, prostaglandin E2, and tranexamic acid, have been used to control bleeding after CS **(Giingordiik et al., 2010)**.

Tranexamic acid (TXA) is a synthetic derivative of the amino acid lysine sine that exerts its anti fibrinolytic effect through the reversible blockade of the lysine binding sites on plasminogen molecules **(Novikova and Hofmeyr, 2010)**. Intravenous administration of tranexamic acid has been routinely used for many years to reduce hemorrhage during and after main procedures like coronary artery bypass, oral surgery, liver transplantation, total hip or knee arthroplasty, and urinary tract surgery **(Ido et al., 2000)**.

Aim of the Study

To state the effectiveness clinically and laboratory and safety of tranexamic acid in reducing blood loss during the elective lower segment cesareansection.

Study question

Is tranexamic effective in reducing blood loss during and after the elective lower segment cesareansection?

Study hypothesis

Null hypothesis: amount of blood loss during cesareansection does not change with use of tranexamic acid.

Introduction and Aim of the Work

Caesarean Section

Caesarean delivery also known as a C-section is a **C** surgical procedure used to deliver a baby through an incision in the mother's abdomen (laparotomy) and a second incision in the mother's uterus (hystrotomy). This definition does not include removal of the fetus from the abdominal cavity in cases of uterine rupture nor in cases of abdominal pregnancy (*Cunningham et al., 2007*).

Caesarean deliveries may be performed because of maternal or fetal problems that arise during labor, or they may be planned before the mother goes into labor (*Vincenzo et al., 2010*).

An emergency CS is defined as one where this mode of delivery had not been anticipated and where it was preceded in labor either spontaneous or induced which was deliberately allowed to continue for a time. All other C.S were defined as elective procedure(*Lurie et al., 2003*).

Incidence of the caesarean section

From 1910-1928, the cesarean delivery rate at ChicagoLying-inHospital increased from 0.6% to 3%. The cesarean delivery rate in the United States was 4.5% in 1965. According to the National Hospital Discharge Survey, the cesarean rate rose from 5.5% in 1970 to 24.1% in 1986. (*Saju Joy, 2014*).

It was predicted that if age-specific cesarean rates continued at the steady pattern of increase observed since 1970, 40% of births would be by cesarean in the year 2000.

Those predictions fell short, but not by much. The National Center for Health Statistics reported that the percentage of cesarean births in the United States increased from 20.7% in 1996 to 32% in 2007. Cesarean rates increased for women of all ages, races/ethnic groups, and gestational ages and in all states (see the image below). Both primary and repeat cesareans increased. **(Saju Joy, 2014)**

Increases in the primary cesareans with no specified indication were faster than in the overall population and appear to be the result of changes in obstetric practice rather than changes in the medical risk profile or increases in maternal request. **(Saju Joy, 2014)**

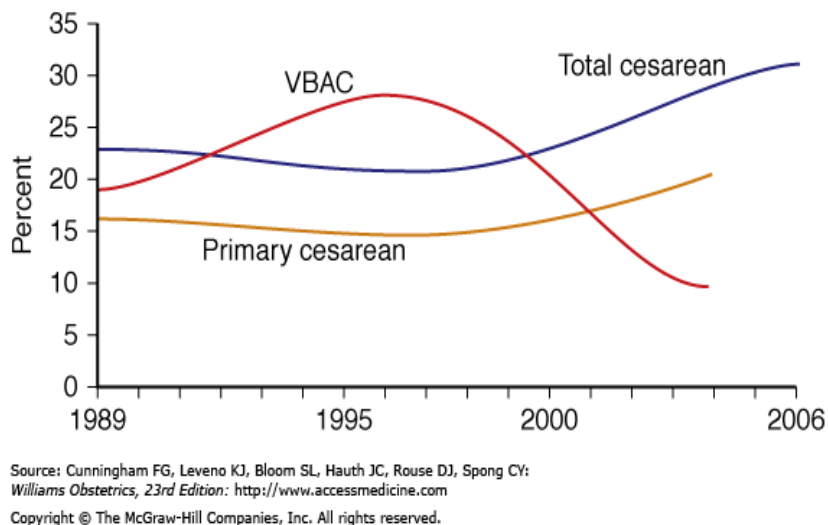


Fig. (1): Percentage Rate VBAC in comparison primary rate
(Cunningham et al., 2009)

Cesarean Section Rates in USA and Europe:

As regard to USA cesarean sections increased dramatically during the 1970s and 1980s, reaching a peak of 24.7 per 100 deliveries in 1988 then between 1988 and 1994

the rate has reached a plateau at around 21 to 22 per 100 deliveries (*Curtin et al., 2010*).

Caesarean section rates in Egypt:

Regarding Egypt, a significant rise in caesarean deliveries has been occurred for all births from a low of 4.6% in 1992 to 10.3% in 2000. However, hospital-based caesarean deliveries were much higher in 1988 (13.9%), increasing to 22.0% in 2000. Although the caesarean section rate was slightly higher in private hospitals, the rate also increased consistently in public hospitals. This high increase in caesarean section rates reported in this study may be partly due to caesarean sections that are not medically indicated, and suggest that physician practice patterns, financial incentives or other profitability factors, and patient preferences should be explored (*Yassin., 2012*).

The CS rates limits used to define underuse and overuse may be a matter for discussion since any classification has some constraints. The 15% upper limit that was suggested by WHO in 1985 could be less valid nowadays taken in account changes of the population in high income countries, such as mother's age at the first child, birth weight and other factors that may result in needing more or less CS. However, as we mentioned above, recent studies have shown that until now there is no evidence of benefit for the health of mothers and babies in populations with values of CS above 15%. (*Luz Gibbons 2010*).

The reasons for the continued increase in the caesarean rates are not completely understood, but some explanations include the following: (*Cunningham et al., 2009*).