Role of tranexamic acid in the treatment of postpartum hemorrhage following cesarean section a randomized controlled trial

Thesis

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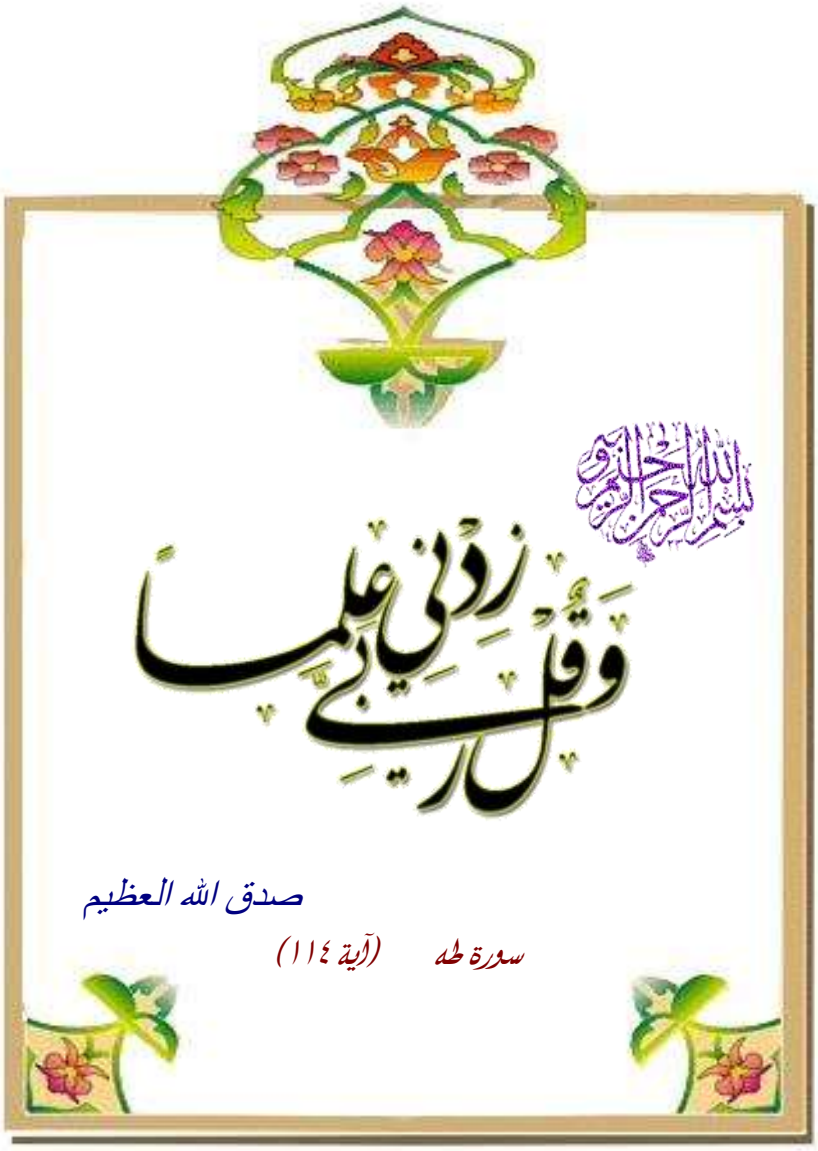

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List of Abbreviations

ACOG	:	American college of obstetricians gynaecologists.
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.
HELLP	:	Haemolysis, Elevated liver enzyme levels, and Low platelets level.
LGA	:	Large for gestational age.
MRI	:	Magnetic Resonance Imaging.
MRSA	:	Methicillin resistant staph aureous.
NSAIDS	:	Non Steroidal Anti-inflammatory Drugs.
PAIS	:	Plasminogen Inhibitors.
PAS	:	Plasminogen Activators.
PPH	:	Post Partum Hemorrhage.
PT	:	Prothrombin Time.
RCOG	:	Royal College for Obstetricians and Gynaecologists.
RCT	:	Randomized Controlled Trial.
TPA	:	Tissue Plasminogen Activator.
TXA	:	Tranexamic Acid.
WOMAN	:	World Maternal Anti-fibrinolytic Trial.

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Introduction

Each year, worldwide, about 800,000 women die from causes related to pregnancy and childbirth. Nearly all (99%) of these deaths are in low and middle income countries ***(WHO, 2012).***

Of the 14 million women who have PPH each year. It is estimated that worldwide, 140,000 women die of postpartum hemorrhage each year one every 4 minutes with an average interval from onset of bleeding to death of 2 to 4 hours ***(ACOG, Bulletin Practice Management Guidelines No.76, 2006).***

Hemorrhage, which usually occurs in the postpartum period, is responsible for between one quarter and one third of obstetric deaths ***(*Abou Zahr, 2003).**

Postpartum hemorrhage (PPH) is commonly defined as blood loss of ≥ 500mL after vaginal delivery of a baby, or ≥ 1000mL after caesarean section **OR** estimated blood loss enough to compromise the hemodynamic status of the woman However, these thresholds do not take into account pre-existing health status, and blood loss of as little as 200 mL can be life-threatening for a woman with severe anemia or cardiac disease ***(Lalonde, 2006).***

Although many deaths from PPH occur outside healthcare facilities, a significant number occur in hospital, where effective emergency care has the potential to save lives ***(Kongnyuy et al., 2009).***

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

PPH also causes hospital morbidity. Many women require blood transfusion which sometimes can transmit blood borne viral infections. Approximately 1% of women with spontaneous vaginal deliveries require transfusion, but the Fig. increases to 5% or 6% for women with instrumental deliveries or caesarean sections ***(Ekeroma et al.,1998).***

The risk of infection from transfused blood is considerably higher in countries that do not screen all blood for transfusion ***(WHO, 2001).***

In high income countries the risk of transfusion transmitted infection is low, but adverse reactions related to blood transfusion are common ***(Taylor, 2008).***

Severe anemia is a common consequence of PPH and affects about 11% of the 14 million women with PPH each year ***(AbouZahr, 2003).***

Severe anemia can cause disabling fatigue and seriously reduce a woman's capacity to look after her children and to work ***(WHO, 1992).***

Systemic antifibrinolytic agents are widely used in surgery to prevent clot breakdown (fibrinolysis) in order to reduce surgical blood loss, in the haemostatic process, coagulation occurs rapidly at the site of a damaged vessel building a tight net of fibrin, while at the same time, the fibrinolytic system removes the fibrin deposits that could cause permanent vascular occlusion once vascular repair has taken place ***(Prentice, 1980).***

The coagulation and fibrinolytic system are believed to be in a state of dynamic balance which maintains an intact vascular system. Tranexamic acid is a potent antifibrinolytic agent that exerts its effect by blocking lysine binding sites on plasminogen molecules and has the potential to enhance the effectiveness of the patient's own haemostatic mechanisms. Consequently, clot breakdown (fibrinolysis) is inhibited and excessive or recurrent bleeding is reduced. During delivery, when the placenta separates from the uterine wall, a sequence of physiologic and haemostatic changes occur that reduce bleeding: strong myometrial contractions, increased platelet

activity, a massive release of coagulant factors and a parallel increase in the fibrinolytic activity ***(Hellgren, 2003).***

As a result, there is a theoretical rationale for the use of antifibrinolytic agents in the treatment of postpartum hemorrhage ***(Bolte, 2005).***

Other uses of Tranexamic acid :

Trauma

Tranexamic acid has been found to decrease the risk of death in people who have significant bleeding due to trauma ***(Cherkas and David, 2011)***.

However, it may actually increase the risk of death due to bleeding if administered more than 3 hours after the injury ***(CRASH-2 Collaborators, 2011)***.

Orthopedic surgery

Tranexamic acid is used in orthopedic surgery to reduce blood loss. It is of proven value in clearing the field of surgery and reducing pre- and postoperative blood loss. Drain and number of transfusions are reduced. However, the hidden blood loss is not reduced. Still, it is becoming an important tool in the anesthetist's arsenal. It is commonly used in joint replacement surgery ***(Dunn, 2009).***

Craniofacial Surgery

Use of tranexamic acid in surgical corrections of craniosynostosis in children reduces the need for blood transfusions ***(RCPCH, 2011)***.