Effect of carbetocin versus oxytocin On maternal blood loss following vaginal delivery: a double-blind ,controlled, randomized trial

Submitted For Partial Fulfillment of Master Degree in Obstetrics & Gynecology

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

يَٰٓأَيُّهَا ٱلنَّاسُ إِن كُنتُمْ فِى رَيْبٍ مِّنَ ٱلْبَعْثِ فَإِنَّا خَلَقْنَٰكُم مِّن تُرَابٍ
ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ
لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِى ٱلْأَرْحَامِ مَا نَشَآءُ إِلَىٰٓ أَجَلٍ مُّسَمًّى ثُمَّ
نُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ۖ وَمِنكُم مَّن
يُتَوَفَّىٰ وَمِنكُم مَّن يُرَدُّ إِلَىٰٓ أَرْذَلِ ٱلْعُمُرِ لِكَيْلَا يَعْلَمَ
مِنۢ بَعْدِ عِلْمٍ شَيْـًٔا ۚ وَتَرَى ٱلْأَرْضَ هَامِدَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا
ٱلْمَآءَ ٱهْتَزَّتْ وَرَبَتْ وَأَنۢبَتَتْ مِن كُلِّ زَوْجٍۭ بَهِيجٍ ﴿٥﴾

صَدَقَ اللهُ العَظِيمْ

سورة الحج: آية (5)

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Mustafa Mahmoud Khattab

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List of abbreviations

ABC	Airway, breathing, circulation.
AFI	Amniotic fluid index.
AMTSL	Active management of the third stage of labour.
aPTT	Activated partial thromboplastin time.
CBC	Complete blood count
CI	confidence interval
CM	Centimeter
CS	Cesarean section.
DAG	Diacylglycerol.
DIC	Disseminated intravascular coagulation.
FFP	Fresh frozen plasma.
HELLP	Hemolysis, elevated liver enzymes, and low platelet count.
HIV	Human immunodeficiency virus.
ICU	Intensive care unit .
IM	Intra muscular.
IMM	Intramyometrial.
INR	International normalized ratio.
IP3	Inositol tri-phosphate.
ITP	Idiopathic thrombocytopenic purpura.
IU	International units.
IV	Intra venous.
LFTs	Liver function tests.
µg	Micrograms.
mg	Milli grams.
ml	Milli liters.
MLCK	Myosin light chain kinase.
MLCK-P	Phosphorylated myosin light chain kinase.
PPH	Postpartum hemorrhage.
PRBCs	Packed red blood cells.
PT	Prothrombin time.

RCOG	Royal college of obstetricians and gynaecologists
TRALI	Transfusion-related acute lung injury.
US	United states
VBAC	Vaginal birth after cesarean section.
WHO	World health organization
WMD	weighted mean differences

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Introduction

Introduction

The third stage of labour is that period from delivery of the baby until delivery of the placenta. After delivery of the baby and cessation of umbilical cord pulsation, the placenta separates from the uterine wall through the spongy lining of the (decidua spongiosa) and is delivered through the birth canal. The placenta separates as a result of capillary hemorrhage and the shearing effect of uterine muscle contraction.[1]

The degree of blood loss associated with placental separation and delivery depends on how quickly the placenta separates from the uterine wall and how effectively uterine muscle contracts around the placental bed (where the placenta is attached to the wall of the uterus) and the blood vessels, during and after separation, and expels the placenta through the birth canal. Moderate loss of blood is physiological and unlikely to lead to later problems except for women who are already anemic. The major complication associated with this stage is postpartum hemorrhage. This is defined as bleeding from the genital tract of 500ml or more in the first 24 hours following delivery of the baby.[2]

Postpartum hemorrhage is the most common cause of maternal death worldwide. Most cases of morbidity and mortality due to post-partum hemorrhage occur in the first 24 hours following delivery and these are regarded as primary post-partum hemorrhage whereas any abnormal or excessive bleeding from the birth canal occurring between 24 hours and 12 weeks postnatally is regarded as secondary post-partum hemorrhage. Post-partum hemorrhage may result from failure of the uterus to contract adequately (atony), genital tract trauma (i.e. vaginal or cervical lacerations), uterine rupture, retained placental tissue, or maternal bleeding disorders. Uterine atony is the most common cause and consequently the leading cause of maternal mortality worldwide.[3]

According to the National Maternal Mortality Study conducted in Egypt in 2000 postpartum hemorrhage (PPH) alone was responsible for 27% of all maternal deaths, making it the leading contributor to maternal mortality in Egypt.[4]

Numerous factors lead to increased incidence of postpartum hemorrhage like prolonged labor, multifetal gestation, large baby, anemia, pre-eclampsia and operative vaginal deliveries. Although one or more risk factors may increase the chance of postpartum hemorrhage, two thirds of postpartum hemorrhage cases occur in women with known risk factors. Hence all pregnant women remain at risk for this catastrophic event.[5]

Complications of postpartum hemorrhage include orthostatic hypotension, anemia, and fatigue, making maternal care of the newborn more difficult. Postpartum anemia increases the risk for postpartum depression .[6]

Each year thousands of women die from post-partum hemorrhage around the world. The prevention and management of postpartum hemorrhage are therefore very important aspects of maternity care. Clinicians should identify risk factors, take steps to prevent post-partum hemorrhage and learn and employ as many of the management techniques as possible. [7]

Routine active management of the third stage of labour (AMTSL) has been recommended for vaginal deliveries in hospital settings. It involves prophylactic administration of utrotonic agents after delivery of the anterior shoulder, controlled umbilical cord traction an early cord clamping and cutting. A key aspect in prevention of post-partum hemorrhage is utrotonic therapy. The most widely used agent is parenteral oxytocin and / or ergometrine. [8-9-10]

Oxytocin, Ergonovine and Methylergonvine are all employed widely in the third stage of labour but the timing of their administration differs in various institutions. Oxytocin which is commercially available in the United States as syntocinon and Pitocin should be given as a dilute solution by continuous intravenous infusion or as intramuscular injection in a dose of 10 units. In cases of post-partum hemorrhage oxytocin may be injected directly into the uterus either transvaginally or transabdominally. [11]

Prophylactic use of an oxytocin agent after delivery of the infant has been shown to reduce the incidence of PPH by 40%. The most common practice in United States for prevention of post-partum hemorrhage is intravenous oxytocin administration after placental delivery. [12]

Carbetocin, a new drug for the prevention of uterine atony, is a synthetic analogue of oxytocin with a half-life of up to 4 to 10 times longer than that of oxytocin. In comparison with oxytocin, it is used as a single-dose injection instead of an infusion and can be given intravenously or intramuscularly. The bioavailability is 80% after intramuscular injection, and the optimal dose used in the third stage of labor is 100 μg. In contrast, carbetocin (1-deamino-1-carba-2-tyrosine(O-methyl) oxytocin) is a synthetic oxytocin analogue that binds to the same oxytocin receptors in the myometrium with an affinity similar to that of oxytocin. Its main advantage over oxytocin is a four-fold longer uterotonic activity, a fact which precludes the necessity of a continuous infusion.. [13]

Aim of the work

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The Aim of This Work is To Compare between The Effect of Carbetocin versus Oxytocin given prophylactically in The Third Stage of Labour on Maternal Blood Loss following Vaginal Delivery.

Chapter (I)