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# Postpartum hemorrhage; A perspective from evidence

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## Abstract

Postpartum hemorrhage although highly preventable, it is the leading cause of maternal mortality in both resource abundant countries and resource limited countries, despite the presence of known risk factors every woman has a chance of developing postpartum hemorrhage during delivery, but identification of high-risk women and active management of third stage of labor has been shown to have positive effects in reducing mortality from postpartum hemorrhage.

## Introduction

Postpartum hemorrhage continues to be the life threating obstetrical emergency, it is the leading cause of maternal death worldwide, in developed regions of the world it accounts for approximately 8% of maternal death while in developing nations it accounts for approximately 20% of maternal death. Can either be primary or secondary depending on the time it has occurred, primary postpartum hemorrhage also known as atonic postpartum hemorrhage occurs within 24 hours after child birth while secondary postpartum hemorrhage occurs beyond 24 hours after delivery up to 12 weeks [1]. High mortality is associated with primary postpartum hemorrhage which occurs within 24 hours after child birth and usually occur secondary to uterine atony, obstetrics lacerations, coagulation disorder or retained placental tissue. Very few cases are associated with secondary postpartum hemorrhage which occurs from 24 hours to 12 weeks postpartum and the main cause being retention of the placenta or placental bed sub involution. Every woman soon after delivery to 12 weeks postpartum has an equal chance of developing postpartum hemorrhage because of poor screening tool and it is difficult to detect the occurrence of postpartum hemorrhage despite the presence of various risk factors for postpartum hemorrhage [2]. This article focuses on definition of postpartum hemorrhage, risk factors, causes and effects of postpartum hemorrhage as well as management of postpartum hemorrhage.

## Definition

Due to challenge in quantification of blood loss and availability of different guidelines for management and prevention of postpartum hemorrhage various definitions are present. Traditionally, postpartum hemorrhage has been described as blood loss of more than 500 mls following a spontaneous vaginal delivery or a blood loss of more than 1000 mls following a caesarean section delivery, but the definition is challenging because, any inaccurate estimation of blood loss will result into misdiagnosis of postpartum example when a women is conducting delivery it is very difficult to estimate the blood loss in mls because what is seen is the visible blood loss any delay to wait for 500 mls of blood to happen will result into severe form of postpartum hemorrhage [3]. Thus, clinically, postpartum hemorrhage is defined as any blood loss that has a potential to produce or produces hemodynamic instability example for anemic women with hemoglobin of 8 g/dl will not be able to tolerate even 100 mls of blood loss, in this woman it's not possible to wait for 500 mls to happen in order to diagnose postpartum hemorrhage. Also, a woman with severe pre-eclampsia when lose small amount of blood less than 500 mls or 1000 mls the woman will develop symptoms of postpartum hemorrhage due to hemoconcentration properties of the blood in severe preeclampsia, postpartum hemorrhage in some cases is defined blood loss leading to fall in hematocrit of greater than 10 percent but the definition is little bit challenging in clinical

practice because making diagnoses of postpartum hemorrhage need immediate action rather than waiting the hematocrit level to fall [4]. Currently, postpartum hemorrhage is defined as any amount of blood loss that has potential to produce or produces hemodynamic instability the definition is accurate and does not base on the quantification of blood loss rather than hemodynamic stability of a patient by considering special condition like severe preeclampsia and anemia in pregnancy as patients with these conditions when lose blood even less than 500 mls or 1000 mls irrespective of mode of delivery will develop symptoms of postpartum hemorrhage [5].

### Risk factors

Risk factors for postpartum hemorrhage can be categorized into medical factors which include overstimulation of the uterus using uterotonic drugs such as oxytocin or surgical by assisted instrumental delivery, maternal factors which include history of postpartum hemorrhage in prior pregnancy as women with a history of postpartum hemorrhage in previous pregnancy has an increased risk of developing postpartum hemorrhage in subsequent pregnancies [6], anemia, hypertensive disorders of pregnancy, prolonged labor, advanced maternal age of greater than 35 years, history of gestational diabetes mellitus, caesarean delivery is also associated with increased risk of postpartum hemorrhage than vaginal delivery, as well as grand multiparity, placental factors such as abruptio placenta because the early the detachment the high the risk for developing postpartum hemorrhage, and placenta previa as the low lying the placenta the high the risk for postpartum hemorrhage during uterine contraction, fetal factors such as macrosomia increase the risk for postpartum hemorrhage. Despite the presence of risk factors but every pregnant woman is at risk of developing postpartum hemorrhage without any know risk factors [7,8].

### Causes

The causes of postpartum hemorrhage can be summarized into four Ts, which stand for tone, tissue, trauma and thrombi. The most common cause of postpartum hemorrhage which account for approximately 75% of cases is uterine atony in which there is hypo contractility of the myometrium after delivery, Postpartum hemorrhage due to uterine atony is often secondary to infection such as chorioamnionitis, therapeutic use of magnesium sulfate in treatment of severe preeclampsia or eclampsia, grand multipara (delivers greater than five times) prolonged labor, labor induction or augmentation using uterotonic drugs such as oxytocin, uterine leiomyomata, uterine overdistention due to multifetal gestation or too much amniotic fluid [9]. Followed by genital track trauma such as uterine rupture, cervical tears, perineal tear including episiotomy and hematoma which accounts for approximately 20% of cases, trauma can occur spontaneously or caused by physician during episiotomy, another cause is retained placental tissue, fetal membranes or blood clots left in uterine cavity which accounts for approximately 10% of cases and occur due to mismanagement of the third stage of labor, and thrombin which is the bleeding disorder or coagulopathy which accounts for less than 1% of cases, can be inherited as in von Willebrand disease which has a potential to cause postpartum hemorrhage or can be acquired which occur due to HELLP syndrome, abruptio placenta, severe preeclampsia or eclampsia [10].

### Effects

Disseminate intravascular coagulopathy is a common effect due to postpartum hemorrhage this occur when all the clotting factors have been consumed and the liver is unable to produce more in order to arrest bleeding common occur in patients with HELLP syndrome, severe preeclampsia or eclampsia, shock occurs due to postpartum hemorrhage because a severe drop in blood pressure due to bleeding can cause hypo perfusion of various body organs including the brain. Renal failure is also documented as integral effect of postpartum hemorrhage because the kidney does not receive a required amount of blood and oxygen in order to perform the required function. Hemorrhagic anemia can also occur due to massive blood loss [11]. Puerperal sepsis is also documented as effect of secondary postpartum hemorrhage and in this case, it occurs due to infection at suture lines and episiotomy sites, Sheehan's syndrome is also documented as a complication of postpartum hemorrhage which occur when the pituitary gland does not receive sufficient amount of blood which led to its necrosis. Also, patients who develop postpartum hemorrhage have an increased risk of developing post-traumatic stress disorders and also can develop cardiovascular disease, prolonged hospitalization, infertility, compartment syndrome and acute respiratory distress syndrome [12].

### Management

Early diagnosis and intervention are important in reducing mortality from postpartum hemorrhage this involve a rapid assessment of a patient and identifying the cause of postpartum hemorrhage by applying the ABCD principle of resuscitation, measuring blood pressure and pulse rate, correct any abnormality seen such as securing airway and ensuring breathing, correcting dehydration by using fluids such as lactated ringer solution or normal saline, ensuring the patient has indwelling urinary catheter in order to monitor urine output because in severe bleeding a patient may present with anuria also catheterization help to empty the bladder as full bladder interfere with uterine contraction and in addition taking blood sample to the laboratory to asses hemoglobin and blood group, these test are important incase blood transfusion is necessary [13]. Next, provide prompt medical treatment according to cause for uterine atony which accounts for large percent cases of postpartum hemorrhage bimanual uterine tamponade is usually the initial step in managing postpartum hemorrhage due to uterine atony in which one hand is inserted inside the vagina and the other hand is placed over the abdomen and the uterus is bimanually compressed in order to induce uterine contractility by stimulating endogenous prostaglandins also uterotonic drugs such as oxytocin has to be administered intramuscular or intravenous, and or misoprostol given per rectal has been shown positive impacts in managing postpartum hemorrhage due to uterine atony but in most cases uterine massage and oxytocin infusion goes simultaneously [14].

If the woman is still bleeding then balloon tamponade has to be employed which involve insertion of the balloon into the uterus the balloon has a capacity up to 500 mls of normal saline which will be inflated until it produces a tamponade effect but due to its expensiveness and not available free of charge condom catheter has been used in place of balloon to control postpartum hemorrhage due to uterine atony [ ].

If balloon tamponade is not working and the woman is still bleeding then surgical approach will be the next treatment option, surgical method used include uterine compression sutures and stepwise vascularization procedures which involve ligation of the arteries that supply the uterus with the exception of common iliac artery in a stepwise manner. But, this procedure takes a longer time compared to the former one, the use of any surgical method will depend on the hemodynamic status of the women if the hemodynamic status of the woman is compromised then uterine compression sutures is the best surgical treatment option [14].

If surgical methods are employed and the women is still bleeding the next treatment option will be hysterectomy and by the time hysterectomy is done the woman will have lost a lot of blood and is likely to be in disseminated intravascular coagulopathy state hence after hysterectomy pelvic pressure parking is very important, unlike uterine parking which has a potential to introduce infection in the uterus, under severe cases where symptoms of hypovolemic shock start to appear blood transfusion is necessary for a patient with postpartum hemorrhage in order to restore the number of hemoglobin but number of units given will depend on level of hemoglobin of a patient during blood loss and treatment goal is to restore hemoglobin level to great than 8 g/dl. For secondary postpartum hemorrhage that is usually caused by uterine sub involution, retained placenta tissue or endometriosis management is usually based on underline cause and treatment of the underline cause will result into treatment of postpartum hemorrhage [17].

## Conclusion and recommendation

Mortality due to postpartum hemorrhage is at the peak because after every 5 minutes one woman dies due to postpartum hemorrhage this is attributed to lack of proper definition of postpartum hemorrhage which contribute to delay in diagnoses and management, unavailability of skilled birth attendants and lack of facility in managing postpartum hemorrhage especially in low level hospital settings. Thus, the definition of postpartum hemorrhage should be unified in both low-income counties and high-income counties which will assist in early diagnoses and treatment of postpartum hemorrhage. Also, active management of third stage of labor is important in reducing morbidity and mortality due to postpartum hemorrhage.

## Declarations

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