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Ways to Decrease Risk of Postpartum Hemorrhage

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Background

Postpartum hemorrhage (PPH) is defined as excessive bleeding (1,000 mL or greater) within the first 24 hours after birth or blood loss accompanied by signs or symptoms of hypovolemia (The American College of Obstetrics and Gynecologists [ACOG], 2017). Postpartum hemorrhage is not only determined by having 1,000mL or more in blood loss but the signs and symptoms that accompany it. Gushing or heavy blood from the vagina with the possibility of blood clots may occur. The signs of PPH include low blood pressure, pale or clammy skin, feeling faint, dizzy, or weak, confusion, rapid heart rate, and pain near the vagina or perineum (ACOG, 2017). Postpartum hemorrhage occurs in the third stage of labor. The third stage of labor is defined as the period from delivery of the newborn to the expulsion of the placenta and membranes (Almutairi et al., 2021). Postpartum hemorrhage risk can be decreased by avoiding induction, interpregnancy intervals, prenatally correcting iron levels, administering oxytocin postpartum, uterine tone checks, and immediate skin-to-skin with a newborn and breastfeeding. Antenatal and during prenatal appointments, patients are not told about the interventions that can be performed to prevent postpartum hemorrhage. Acts of prevention are critical for decreasing maternal mortality from postpartum hemorrhage. “Prevention is better than a cure” (Cooper et al., 2019). Patients lack the resources to obtain this important education.

Purpose

There is a high need for education concerning this issue. Unfortunately, “Postpartum hemorrhage is the leading preventable cause of maternal mortality” (Jena et. al., 2022). For this reason, education is so crucial because identifying the risk factors can prevent PPH. It is easier to prevent PPH than it is to manage it. In addition, management of PPH should begin in the antenatal period, with recognition of high-risk pregnancies and referral for multispecialty input (Cooper et al., 2019). In the antenatal period, iron deficiency anemia can be identified, as well as

education on interpregnancy intervals, and risks to induction. Individuals need to be aware of actions that can be taken during the postpartum period to prevent postpartum hemorrhage. Pregnant people-and their partners need to know about the value of skin-to-skin contact and receive this information as part of antenatal care and education" (Kartal et al., 2022). Another action to take with the newborn that has been proven effective is breastfeeding the newborn. This can prevent uterine atony by producing oxytocin. Overall, there is a total of 295,000 estimated maternal deaths worldwide in the year 2017 and continues to be the number one cause of maternal death around the globe (Almutairi et al., 2022). It is mostly caused by uterine atony even though PPH is a preventable and treatable condition (Almutairi et al., 2022). Even after the medical community is aware of this preventable risk it continues to be a widespread issue. There are globally high maternal mortality rates with PPH accounting for 25% of maternal deaths globally (Cooper et al., 2019).

There is a tremendous need for education to the pregnant population. Healthcare providers have this knowledge to decrease the risk of PPH, but pregnant people do not always have this information. The pamphlet created can offer concrete preventative measures explained to patients during the prenatal period. It is written at a seventh-grade reading level to be easily read by everyone. It avoids medical jargon, and provides easy concrete measures to decrease a person's risk. It gives information that involves controllable risk factors, rather than overwhelming someone with uncontrollable risk factors. The pamphlet will also be placed at doctors' offices for people to have a hard copy of the information to take home. This provides easy access to those attending prenatal, perinatal, and postnatal visits. It supplies written information that does not require technology or sifting through the internet.

Preconception/Pregnancy

Interpregnancy intervals

Interpregnancy interval is time elapsed from live birth to subsequent conception or woman's last menstrual period) <18 months and <24 months (Jena et al., 2022). A short time lapse between pregnancies has been proven to be a risk factor in many studies. Pregnancies that occur less than 24 months about increases the risk of primary PPH causing more than half (66%) compared to longer pregnancy intervals (Jena et al., 2022). Pregnancy spacing is beneficial as it gives the body and uterus time to fully heal decreases the chance and/or severity of PPH. Interpregnancy intervals helps the uterine wall to recover from the abnormal process of remodeling of endometrial vessels, incomplete healing of uterine scars, hormonal imbalance, and nutritional depletion (Jena et al., 2022). Uterine atony is the most common cause of postpartum hemorrhage (Muñoz et al., 2019). Therefore, insufficient healing of the uterine lining creates more of a risk for the following pregnancy. Postpartum hemorrhage is preventable and could be prevented if the inter-pregnancy interval was increased to 24-60 months" (Jena et al., 2022). Furthermore, The World health organization (WHO) recommends pregnancy spacing. In total, increasing awareness of this issue through prenatal education can decrease postpartum hemorrhage rates by reducing the risk factor associated with short interpregnancy spacing.

Avoiding Induction

Induction of labor (IOL) is a useful intervention if necessary for maternal and/or fetal health. Although, IOL should be avoided if not needed due to the significant risks that are associated with the induction of labor. Induction of labor is a common intervention that initiates the labor process by human stimulation of uterine contraction before the spontaneous onset of labor (Zhang et al., 2022). Induction of labor comes at an increased risk of postpartum hemorrhage. The longer the duration of labor, the increased risk of PPH occurs. An observational cohort study

on almost 20,000 women presented the active phase of labor in induced women were 541 minutes and 433 minutes for spontaneous labor (Ostborg et al., 2017). As a matter of fact, the length of labor and postpartum hemorrhage has a positive correlation with each other. In a retrospective case-control study that consisted of 4,386 pregnant people, the induction of the labor group had a significantly longer total duration of labor, more postpartum blood loss, and a significantly higher incidence of severe (PPH) compared to the spontaneous onset of labor group (Zhang et al., 2022). In another study of 445 women, 62 women (14%) had postpartum hemorrhage (PPH) of >1000 mL and 22 women (4.9%) had a blood loss of >1500 mL (Kumar et al., 2021). These studies demonstrate the danger that can occur. Induction of labor is a risk factor for PPH (Kumar et al., 2021). The postpartum hemorrhage risk assessment tool identifies risk factors according to low, medium, and high on the scale. Association of Women's Health Obstetric, and Neonatal Nurses identifies induction of labor with oxytocin as a medium risk on the risk assessment scale (Faysal et al., 2022). Also, the California Maternal Quality Care Collaborative as a medium risk factor, and NYSHBOH determines the prolonged second stage of labor as a medium risk factor as well (Faysal et al., 2022).

Iron

Iron deficiency anemia (IDA) is a common contributor to postpartum hemorrhage. The body during pregnancy requires more iron than a nonpregnant person. ACOG states Hemoglobin should be greater than 11 g/dL during the first and third trimesters, and greater than 10.5 g/dL in the second trimester (Faysal et al., 2022). The reason this is a problem during pregnancy is that the plasma volume expands which in turn decreases the hemoglobin concentration (Faysal et al., 2022). Therefore, an increased intake of iron is needed during pregnancy. Iron deficiency anemia is an issue in the United States and worldwide. Worldwide, IDA affects 38% of women, and

50% of women in developing countries (Faysal et al., 2022). In the United States, a nationwide study reported that the incidence of PPH increased by 100% between 1998 and 2008 (Omotayo et al., 2022). That alarming high rise in occurrence is concerning. Anemia is one of the most frequent complications of pregnancy, creates it to be a leading contributor to PPH (Omotayo et al., 2022). Due anemia being a leading contributor of PPH, anemia is not adequately being diagnosed and treated during prenatal care. Management of iron deficiency anemia was demonstrated to be protective against postpartum hemorrhage (Faysal et al., 2022).

For patients diagnosed with iron deficiency anemia, an increase in iron-rich foods and possibly oral iron supplementation may be needed. Oral iron supplementation is the first-line treatment for IDA, with typically about 30mg being recommended (Faysal et al., 2022). If dietary interventions are implemented along with oral iron supplements, another method of treatment may be necessary. Intravenous iron therapy may be indicated in the scenario of minimal or no response to oral iron supplementation, poor compliance or tolerability, and malabsorption disorders (Faysal et al., 2022). Precisely, iron requirements exceed 1000 mg, with 500 mg required for red blood cell expansion, 350 mg for the developing fetus, and 250 mg for blood losses during delivery (Faysal et al., 2022). In IDA, cellular dysfunction leads to impaired transport of hemoglobin and oxygen to the uterus because of impaired myometrial contractility. (Faysal et al., 2022). The result of the decreased uterine blood flow leads to inadequate uterine contractions. (Faysal et al., 2022). If uterine contractions are ineffective, uterine atony occurs and causes postpartum hemorrhage. In total, the management of iron deficiency anemia was demonstrated to be protective against postpartum hemorrhage (Faysal et al., 2022).

Postpartum

Oxytocin

As previously discussed, uterine atony is the leading cause of PPH. Oxytocin is a drug that is used to aid with uterine atony by producing effective uterine contractions to shrink the uterus to pre-pregnancy size. Oxytocin (Pitocin) is the synthetic form of the hormone oxytocin that the body produces. A multidisciplinary panel of physicians gathered together to create recommendations to prevent and treat PPH. The expertise of these physicians was in obstetrics, anesthesia, hematology, and transfusion medicine was convened by the Network for the Advancement of Patient Blood Management, Hemostasis and Thrombosis (NATA) in collaboration with the International Federation of Gynecology and Obstetrics (FIGO), the European Board and College of Obstetrics and Gynecology (EBCOG), and the European Society of Anesthesiology (ESA) (Muñoz et al., 2019). The panel convened that oxytocin is the preferred treatment providing preventative treatment for reducing PPH. They stated it should be used in the third stage of labor for all births (Muñoz et al., 2019). The guideline is to administer oxytocin after the delivery of the shoulders or rapidly after birth, or after placental delivery, if not administered previously (Muñoz et al., 2019). FIGO recommends that Intravenous oxytocin alone is the first-line uterotonic drug for the treatment of PPH (Escobar et al., 2022). Also, The World Health Organization (WHO) released an updated guideline for Active Management of the Third Stage of Labor (AMTSL) that emphasized the primary effect of oxytocin to prevent postpartum hemorrhage (WHO, 2014). Each health organization studied recommends the use of oxytocin in the third stage of labor to prevent postpartum hemorrhage

Uterine Tone Check

Uterine tone checks are an essential part of preventing and managing postpartum hemorrhage. It is a simple mechanical and physiological measure consisting of palpating and

rubbing the uterine fundus (Muñoz et al., 2019). It has been discovered that uterine atony, or when the uterus fails to contract after delivery, accounts for 70-80 percent of cases and should usually be considered first (ACOG, 2017). Checking the uterus frequently be used as a preventative measure for PPH and can catch if it is boggy. AWHONN emphasized the importance of immediate assessment of uterine tone and continuation of checks through uterine tone assessment every 15 minutes for two hours (ACNM, 2017). WHO states this as well, but fundal massage is now considered an optional step based on indications and the woman's wishes, as well as that continuous uterine massage is not recommended for women who receive oxytocin (2012). Therefore, assessing uterine tone is necessary, but the use of a uterine massage is not.

Voiding

The act of voiding postpartum can aid in the uterus contracting to pre-pregnancy size. The distended bladder can prevent the uterus from contracting. It is always important to use the least invasive method first to prevent and treat postpartum hemorrhage. Emptying the bladder to stimulate uterine contractions represents the first-line management of PPH (Muñoz et al., 2019). Several organizations other organizations indemnify this as an effective method as well.

Postpartum with a newborn

Skin to skin

Skin-to-skin has demonstrated effectiveness in reducing postpartum hemorrhage. It has been shown that skin contact applied at the third stage of labor significantly reduced the PPH hemorrhage in the first 24 hours after birth (Kartal et al., 2022). The third stage of labor is the time between the infant being born, and the placenta being delivered. The reason for this is the production of maternal oxytocin. Once the newborn is placed on the mother's chest, the vagus

nerve is stimulated by the newborn's contact and heat, as well as the mother's olfactory receptors are stimulated (Aydin Kartal et al., 2022). Oxytocin produces uterine contractions for the uterus to expel the placenta from the uterine wall. Then once the placenta is delivered, the uterine contractions continue to shrink the uterus to pre-pregnancy size. A recent randomized control study showed that there was a statistically significant increase in the oxytocin levels observed in the intervention group at the 30-minute mark after delivery (Kartal et al., 2022). The WHO recommends skin-to-skin contact immediately after the birth of the newborn (2012). This starts the body to instantaneously begin producing oxytocin to support the third stage of labor. Not only does the natural oxytocin produced from skin-to-skin contact help deliver the placenta and shrink the uterus, but it also significantly increases postnatal oxytocin levels (Aydin Kartal et al., 2022). It also lowers cortisol and adrenocorticotropin hormone, also known as ACTH (Almutariri et al., 2021). The result is that it increases the circulating endogenous estrogen levels, which causes effective contractions of the myometrium and occludes blood vessels, preventing blood loss (Almutairi et al., 2021).

Breastfeeding

Comparable to skin-to-skin contact (SSC), breastfeeding also produces oxytocin. Immediate breastfeeding after birth during the third and fourth stages of labor should be practiced if the birthing person decides to breastfeed. Studies have shown that birthing person who performed SSC along with breastfeeding had less estimated blood loss than those who did not (Almutairi et al., 2021). A study of over 7,500 women exhibited that mothers without SSC contact were twice as likely to experience postpartum hemorrhage (Almutairi et al., 2021). As discussed above, oxytocin is the first line of drug used to prevent and treat postpartum hemorrhage. As mentioned previously, lowered cortisol and ACTH increase the circulating endogenous oxytocin levels when not only skin-to-skin contact is performed, but also when

breastfeeding is executed. Furthermore, when estimated blood loss is minimal, it increases the level of endogenous oxytocin in the mother's blood (Almutairi et al., 2021). When performing skin-to-skin and breastfeeding endogenous oxytocin released during SSC + BF can cross the blood and brain barrier and enhance the sensitivity of oxytocin receptors for better functioning, but the synthetic oxytocin does not cross this barrier" (Almutairi et al., 2021). One last notable benefit of the combination of breastfeeding and skin-to-skin contact is the reduction of maternal stress. A nurturing environment for the mother reduces maternal stress by increasing the level of circulating endogenous oxytocin, which decreases the risk of PPH by 50% (Almutairi et al., 2021). Therefore, this is a key component to integrate into the birthing process to prevent postpartum hemorrhage.

Conclusion

Postpartum hemorrhage risk can be decreased by avoiding induction, interpregnancy intervals, correcting iron levels, administering oxytocin postpartum, uterine tone checks, and immediate skin-to-skin contact with the newborn and breastfeeding. Oxytocin is produced by skin-to-skin contact and breastfeeding which in change aids the progression of uterine contractions. Early diagnosing and treatment of iron deficiency anemia decreases the risk of postpartum hemorrhage by correcting the hemoglobin levels. Induction of labor typically causes longer labor than someone in labor spontaneously. This increases the risk of PPH by having a longer duration of labor. Two or more years between pregnancies give the uterus and body time to heal for the next pregnancy, preventing uterine atony. Likewise, postpartum doing 15-minute uterine tone check intervals ensures that the uterus is hard and not boggy. Overall, each of these components is very impactful in reducing postpartum hemorrhage and thus decrease maternal mortality.

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