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The Efficacy of Umbilical Oxytocin Injection in The Management of Retained Placenta

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ABSTRACT: *This study investigates the efficacy of umbilical oxytocin injection in managing retained placenta, a condition posing risks to maternal well-being. Oxytocin's pharmacology, including its mechanism of action and administration routes, is explored, highlighting its role in stimulating uterine contractions and placental expulsion. Evidence from studies supports oxytocin's effectiveness and safety in treating retained placenta. Implications for midwives' practice are discussed, emphasizing the importance of timely recognition, proper administration, and close monitoring during oxytocin use. Midwives' involvement in educating women, collaborating with healthcare teams, and ensuring comprehensive care underscores their vital role in managing retained placenta and promoting positive birth outcomes.*

KEYWORDS: efficacy, management, retained placenta, umbilical oxytocin injection

INTRODUCTION

The 2023 UN report indicates that the worldwide maternal mortality rate was 223 deaths per 100,000 live births in 2020. This is a decrease from 227 in 2015 and 339 in 2000. In 2020, there were around 287,000 maternal fatalities globally, with 70% of them occurring in sub-Saharan Africa. Nigeria's maternal and child mortality rate was at 540 deaths per thousand,

according to the United Nations in 2023. Retained placenta, an avoidable condition, greatly contributes to postpartum haemorrhage, a primary cause of maternal death and morbidity (Edwards, 2018; UN, 2023). The occurrence of this condition is not limited to women with specific risk factors, highlighting the need of midwives being well-prepared and knowledgeable about its care (Reddi, 2017).

Manual removal of placenta (MROP) performed under anaesthesia is a vital and established procedure that should be carried out within a few hours after birth in order to minimise haemorrhage (Kongwattanakul et al., 2018). Possible complications including haemorrhaging, infections, damage to the vaginal tract, perforation of the uterus, inversion, and hazards associated with anaesthesia (Perlman & Carusi, 2019; Anteby et al., 2019). Mathan (2017) discovered that MROP (Manual Removal of Placenta) was linked to an increased risk of retained product of conception (RPOC), which necessitated further treatments.

Retained placenta during vaginal birth may be identified when the placenta fails to be delivered naturally within a certain timeframe, which is often described as a duration of 18–60 minutes. Successful placenta delivery requires sufficient uterine contractions, which result in the separation of the placenta and decidua from the uterine wall and the subsequent ejection of the tissue. Retained placenta may arise from conditions such as minor uterine atony, abnormally adherent placenta (placenta accreta spectrum), or premature closure of the cervix prior to the natural ejection of the placenta (Nicola, 2022). Retained placenta is a frequent occurrence during pregnancy that can lead to postpartum haemorrhage, particularly in developing countries with limited access to proper obstetric care. This complication is often associated with Sheehan's syndrome and maternal mortality. It affects approximately 1% to 6% of all births. The most frequent complication of the third stage of labour is often sudden and occurs without any previous indication (Olowookere 2020). Failure to promptly address or neglecting the care of retained placenta carries a significant likelihood of haemorrhage and infection.

Multiple techniques may be used to eliminate a retained placenta, including the administration of systemic oxytocics such as prophylactic oxytocin injections, umbilical vein oxytocin injection, and physical removal of the placenta. Typically, the primary approach for treating retained placenta is by the manual removal of the placenta (MROP) under anaesthesia. This procedure should be performed within a few hours after birth to prevent excessive bleeding. Potential complications arising from the manual extraction of the placenta including haemorrhaging, infections, damage to the vaginal system, perforation of the uterus, uterine inversion, and hazards related with the specific kind of anaesthesia used. In his research, Mathan (2017) found that manual placental removal is associated with both short- and long-term difficulties, such as a high probability of retained product of conception (RPOC), which often requires further invasive treatments.An efficient non-invasive substitute for retained placenta might possibly decrease the physical and psychological distress caused by manual extraction, as well as its associated expenses. Additionally, it might be potentially life-saving by offering a treatment option in locations where contemporary surgical facilities or anaesthetics are not readily available.

Administering uterotonics directly into the uterus via the umbilical vein and placenta is a cost-effective and appealing method for treating retained placenta. The administration of oxytocin via the umbilical vein involves injecting the drug directly into the retro placental myometrium, specifically into the placental bed (Mohammed, 2020). The Guideline development group systematically assessed the trade-off between the positive and negative outcomes of administering oxytocin through umbilical vein injection. They also considered the level of certainty in implementing this procedure by taking into account the values and preferences of stakeholders, resource needs and cost-effectiveness, acceptability, feasibility, and fairness (WHO 2020). As a result of the emergence of new research, the World Health Organisation (WHO) revised four guidelines in 2020 on the prevention and management of postpartum haemorrhage (PPH). One of the updated recommendations now includes the use of umbilical vein injection of oxytocin as a therapy for retained placenta. The target audience for these guidelines comprises healthcare professionals engaged in delivering care to women and their infants throughout the process of labour and delivery, including midwives (WHO, 2020). In view of the above, the study examines the efficacy of umbilical oxytocin injection in the management of retained placenta

Evaluation of Retained Placenta

The period between the birth of the baby and the expulsion of the placenta is often known as the third stage of labour. Postpartum haemorrhage, characterised by vaginal bleeding over 500 ml during the first 24 hours after childbirth, is the primary complication associated with this period. Uterine atony is the primary cause of immediate and severe postpartum haemorrhage. Complications may arise due to the presence of a retained placenta, lacerations in the vaginal or cervical area, as well as uterine rupture or inversion. Postpartum haemorrhage is the leading cause of maternal mortality worldwide, accounting for 25% of all maternal fatalities.

The third stage of labour starts immediately after the baby's birth, encompassing the detachment of the placenta from the uterine wall and culminating in the full expulsion of the placenta and membranes. The duration typically ranges from five to fifteen minutes, however durations of up to one hour are also permissible. Oxytocin levels during the third stage of labour surpass pre-birth levels and remain notably elevated for 45 minutes following delivery, coinciding with the expulsion of the placenta. The placenta may split in two different ways, with the separation usually starting in the centre of the placenta, which descends first (International Confederation of Midwives, 2011). The membranes become visible after the foetal surface, and there is little or no observable blood present. Occasionally, the placenta detaches from the lower edge and shifts laterally, resulting in the maternal surface being exposed first in the vagina (Hofmeyr et al., 2018). The latter leads to a decreased rate of separation, and haemorrhage is likely to be more widespread.

The initiation of a healthy placentation is indicated by the implantation of the blastocyst into the mother's endometrium. During the early stages of pregnancy, the hormones progesterone and oestrogen stimulate the growth of the endometrium, leading to the development of the decidua, which is necessary for the implantation process (Healy, et al., 2016). The layer of cells comprising the surface of the blastocyst undergoes a transformation into the chorionic

membrane when the blastocyst infiltrates the decidua. The cytotrophoblast cells inside the chorionic membrane undergo multiplication to form multinucleated clusters referred to as syncytiotrophoblast cells. The placental villi consist of these cells, which facilitate the flow of substances between the foetus and the mother via contact between the villi and the decidua. The separation of these layers and the expulsion of the placenta during birthing are facilitated by uterine contractions and a hormonal cascade.

Preterm labour, augmented labour, and nulliparity increase the likelihood of experiencing extended third stages of labour, which may need manual placenta removal. This procedure triples the risk of postpartum haemorrhage (PPH). Retained placenta often leads to PPH, but the phrase "prolonged third stage" remains a subject of debate. According to some authors (Hewitt, 2019; Fullerton, et al., 2013; Edwards & Wickham, 2018), it has been suggested that the third stage of labour is extended when the placenta is not expelled within a timeframe of 30 to 60 minutes. This occurrence is seen in around 3% of all childbirths.

Retained placenta is often attributed to one of three pathophysiologies. The normal detachment and expulsion of the placenta may be hindered by a uterus that lacks sufficient contractions, leading to uterine atony (Du, et al., 2018). Furthermore, a placenta that exhibits aberrant adhesion or invasiveness, as identified by the placenta accreta spectrum (PAS), may have difficulties in undergoing proper separation (Hewitt, 2019). Ultimately, if the cervix seals shut prior to the delivery of the placenta, there is a possibility that the placenta, once detached, might get ensnared or confined. While the exact process is not well understood, it has been suggested that placental hypoperfusion illnesses, such preeclampsia, and infection may be potential causes of retained placentas (Dixon, et al., 2018).

A "retained placenta" (RP) occurs when the placenta remains in the uterus for an extended duration after childbirth. RP is a medically recognised diagnosis that has different time limitations in different countries (Choppala & RamanaBai, 2016). The time restriction is often set at 30 minutes in most English-speaking countries, but it extends to 60 minutes in certain Northern European nations, such as The Netherlands. Gynaecologists in English-speaking nations often perform manual removal of the placenta (MRP) within 30 minutes, but in North European countries, it is done after 60 minutes, provided that bleeding is under control. Due to the lack of evidence linking the postpartum period to any clinical complications, the World Health Organisation (WHO) has not established an official or recognised definition of retained placenta. According to a WHO publication on the management of complications during pregnancy and childbirth (Carroli, et al., 2018), it is advised to classify the placenta as retained if it has not been removed within 30 minutes after the infant is delivered. In the absence of haemorrhage, the physical removal of the placenta may be postponed for an additional 30 minutes as there is still a chance for it to be expelled naturally. Hence, it is recommended to use a cautious approach, and the clinician's discretion will be employed to ascertain the appropriate utilisation of the MRP as a targeted therapeutic intervention (Buckley, 2015).

Following delivery, the placenta usually separates from the uterine wall and must be evacuated from the body in order to complete the birthing process. Occasionally, the placenta may not be

spontaneously ejected and need medical intervention for extraction. The method described is known as Manual Removal of the Placenta (MRP) (Buckley, 2015).The phrase implies that if there is no early postpartum haemorrhage, the manual extraction of the placenta might be postponed for an extra 30 minutes. The reason for this delay is the potential for the placenta to be naturally removed by the body at this specific period. Spontaneous ejection is the process by which the placenta detaches and passes out of the body without any medical intervention.The inclusion of the clinician's discernment emphasises the significance of tailored treatment and decision-making. Prior to determining the optimal time for MRP, healthcare practitioners must thoroughly evaluate the patient's state, including variables such as the existence of haemorrhage, the patient's stability, and other clinical signs.

Retained placenta after vaginal birth is diagnosed when the placenta does not spontaneously expel within a certain timeframe, often ranging from 18 to 60 minutes. If a patient has significant pre-delivery placental haemorrhage, it may also be identified. In order for a proper delivery of the placenta to occur, it is necessary to separate the placenta and decidua from the uterine wall and then evacuate them. Consequently, a retained placenta may occur due to acute uterine atony, premature closure of the cervix before the placenta is evacuated, or abnormal adherence of the placenta, such as in placenta accreta spectrum (PAS) (Begley, et al., 2019).

A retained placenta is considered an obstetric emergency. Due to the disease's lethal nature, which involves significant blood loss and coagulation problems, it is crucial to promptly diagnose and treat it (Asicioglu, et al., 2019). Improper treatment of the third stage of labour is a significant cause of uterine inertia, leading to postpartum haemorrhage and retained placenta. Identifying risk factors for the formation of retained placentas during prenatal care and ensuring proper delivery with active treatment of the third stage of labour might reduce the occurrence of this condition (Al-Jeborry, et al., 2010).This underscores the need of monitoring and resolving variables that may predispose a woman to acquire this illness. Furthermore, data indicates that using active management approaches during births might effectively minimise the occurrence of retained placenta. The citation of Al-Jeborry et al. (2010) is likely to provide empirical or clinical evidence in favour of these preventative interventions.

In cases of difficult and prolonged labour, there is a possibility that the placenta may completely detach yet still stay within the body. In certain cases, the placenta may become detached either completely or partly. However, it remains in place due to a constriction or contraction ring located at the junction of the upper and lower parts of the uterus. There may be either partial or full pathological attachment of the placenta, with partial adhesion being more common than complete adhesion. There are three distinct types of morbidly adherent placentas. Placental accreta refers to the attachment of placental villi directly to the myometrium due to the complete or partial absence of the decidua basalis. Placenta increta refers to a notable infiltration of the myometrium by the villi. Placenta percreta refers to the complete infiltration of the full thickness of the uterine wall. Placenta accreta may include a single cotyledon, either partially or completely (focal placenta accreta). Prolonged retention of the placenta poses many risks, such as excessive bleeding, shock due to blood loss or repeated efforts to remove the placenta by abdominal manipulation, and postpartum infection. Multiple strategies exist to

mitigate placental retention (Amorim, 2020). Thoroughly gathering information about a patient's medical history during the prenatal examination might aid in identifying potential risk factors for retained placenta or altered placenta adhesion, such as a previous occurrence of placenta previa, dilatation and curettage, caesarean section, manual placenta removal, or any prior uterine surgeries. Correcting anaemia is vital because it may lead to uterine inertia, which is caused by a lack of oxygen in the uterine muscles.

A retained placenta often occurs due to inadequate handling of the third stage of labour. Utilising Active Management of the Third period of labour (AMTSL) in all labour scenarios might effectively decrease the occurrence of placental retention during this period (Alkema, et al., 2016). Nevertheless, using active management reduces the time required to deliver the placenta from the typical 10-20 minutes to a mere 5-10 minutes. The study conducted by Afshari et al. in 2018 Haemorrhage is often seen as an initial sign when the placenta is not expelled after childbirth. It may appear without any signs of bleeding. Hence, the first action is requesting aid, promptly mobilising all available personnel, and promptly evaluating the women's general condition, encompassing vital signs. At the stage when the placenta is completely separated but has not yet been expelled. The administration of oxytocin infusion should be initiated. If the uterus is contracted and the placenta has not been expelled after 30 minutes of oxytocin stimulation, it is recommended to do a controlled cord traction manoeuvre..

Overview of Oxytocin

Oxytocin, a hormone that occurs naturally, is synthesised in the brain, then transported to the posterior pituitary gland, and finally stored in that location. Vigneaud identified the amino acid sequence of this cyclic nonapeptide around 50 years after its discovery by Dale, enabling its chemical synthesis. Oxytocin may be administered intravenously or intramuscularly using a 1 ml ampoule that contains 10 IU of the hormone. Oxytocin, whether administered intravenously or intramuscularly, is rapidly absorbed, with an onset of action of 1 minute and 3-5 minutes, respectively. The plasma half-life of the substance ranges from 5 to 12 minutes, and its effect lasts between 40 minutes and 2 hours when given by intravenous or intramuscular administration (Dixon, et al., 2018). Its ability to bind plasma proteins is very somewhat effective. When ingested, this drug is deactivated by proteolytic enzymes in the gastrointestinal system. Oxytocinase, a glycoprotein aminopeptidase, is produced during pregnancy and is responsible for breaking down oxytocin-producing metabolites, which are mostly excreted in the urine. Nevertheless, a little fraction of 1% of oxytocin is expelled from the body without undergoing any changes.

Oxytocin functions via binding to G-protein coupled receptors. During the early postpartum period and as pregnancy nears its completion, these receptors see a gradual and consistent rise. Upon activation, these stimuli induce the liberation of calcium from intracellular reservoirs, leading to the contraction of the uterine smooth muscle and the closure of blood vessels, therefore preventing postpartum haemorrhage. Oxytocin is associated with noticeable adverse effects such as significant decreases in maternal systolic and diastolic blood pressure, an increase in heart rate, an increase in systemic venous return and cardiac output, as well as the

occurrence of arrhythmia. Oxytocin may induce water intoxication and has a little anti-diuretic action.

Uses and Benefits of Oxytocin Injection

Endorphins, catecholamines, and oxytocin have all been discovered to play key roles in the third stage of labor. During the second stage of labour, the hormones adrenaline and noradrenaline, also known as "fight-or-flight" hormones, provide the body with a boost of energy to assist in the process of delivering a baby. In contrast, endorphins, which are natural painkillers, induce a modified state of awareness and effectively alter the perception of pain (Buckley, 2001). According to Uvnäs-Moberg et al. (2019), oxytocin is vital for the third stage of labor and delivery. Oxytocin, named from the Greek words meaning "quick" and "childbirth labour," is synthesised in the hypothalamus and released into the posterior pituitary. During labor, the pituitary produces oxytocin in pulses, which induces the uterus to contract (Uvnäs-Moberg et al., 2019).

A popular medicine used during labour is oxytocin. It is applicable at any stage of labour, including the initial phase of induction, the first and second phases for augmentation, and the third stage for preventing haemorrhage. Oxytocin is used during the caesarean section (CS) operation to promote uterine contraction and minimise excessive blood loss. Oxytocin has prominent cardiovascular effects that are readily observable when administered as a bolus.

Due to its historical association with femininity, the term "oxytocin" is derived from the Greek phrase meaning "fast childbirth." A broad variety of functions have been assigned to this hormone as our knowledge base continues to increase. Two systems—the central Oxytocin system and the peripheral Oxytocin system—have been discovered as a consequence of the multiple actions this hormone conducts. The negative effects of oxytocin mostly stem from the secretion of the pituitary gland. The behavioral effects of this hormone are thought to be a reflection of the secretion from Oxytocin neurons that secrete differently from those that enter or are collaterals from the posterior pituitary (Ross et al. 2009). The primary rationale for this notion is that the blood-brain barrier hinders the re-entry of oxytocin, a hormone secreted by the pituitary gland, into the brain.

An animal neurohypophysial hormone is oxytocin. The original name of the phrase was taken from the Greek words "oxys" and "tokos," which mean quick birth. This hormone mainly acts as an inhibitory neurotransmitter in the brain, functioning as a neuromodulator that affects several biological activities. The posterior pituitary gland, which is the major source of oxytocin in the blood, secretes the nonapeptide oxytocin, which is generated in the brain. Oxytocin is produced in several organs including the gastrointestinal system, heart, testicles, uterus, placenta, amnion, corpus luteum, thymus, adipocytes, pancreas, and kidneys. Oxytocin will be destroyed in the digestive system, hence oxytocin cannot be supplied. Administration of oxytocin by intranasal spray is possible. Furthermore, pharmaceuticals containing artificial oxytocin are commercially available under the brand names Pitocin and Syntocinon.

The administration of artificial oxytocin during labour, specifically for the prevention and treatment of postpartum haemorrhage, has been shown to raise the probability of a woman being diagnosed with a depression or anxiety disorder, or being prescribed an antidepressant or anti-anxiety medication within the first year after childbirth (Kroll-Desrosiers et al., 2017). More study is required on the endogenous and exogenous behavioral effects of oxytocin, especially its relevance during the peripartum period (Kroll-Desrosiers et al., 2017).

Oxytocin, being a hormone, fulfils other additional functions. In nursing women, oxytocin induces the letdown reflex, which permits the mammary glands to empty milk into subareolar sinuses before it is discharged by the nipple. In addition, oxytocin stimulates contractions during the second and third phases of labour and aids in the dilation of the cervix before birth. The hormone may also impact the efficacy of wound healing. Oxytocin slows down various cytokines that may reduce inflammation, hastening the healing process.

Furthermore, oxytocin receptors are present in several regions of the brain associated with mental well-being and conduct, such as enjoyable social engagements (Landgraf & Neumann, 2004). Oxytocin may influence couple bonding, parental care, sexual behaviour, and the ability to form stable social connections. Oxytocin affects the social distance between men and women, and is also believed to be involved in the formation of monogamous bonds and sexual desire. Moreover, oxytocin has the ability to influence anxiety, trust, and charity. Because oxytocin regulates these three essential parts of human character, it also influences a substantial chunk of our social environment. To fully understand the active function of oxytocin, it is necessary to get a profound understanding of the hormone's influence on the brain.

During the period between complete dilatation and crowning, there is a significant rise in oxytocin levels. Towards the end of labour, there is a four-fold increase in oxytocin levels, which is linked to the birth of the baby (Uvnäs-Moberg et al., 2019). After delivery, oxytocin continues to be produced in conjunction with the placenta's evacuation (Uvnäs-Moberg et al., 2019). Additionally, skin-to-skin contact during the vital hour after a normal delivery enhances peak oxytocin activity, which may result in stronger contractions and a lower risk of postpartum hemorrhage (PPH) (Buckley, 2015). This age has the most elevated levels of oxytocin peak compared to any other phase in a woman's life.

Endogenous oxytocin has an influence on the uterus, while also enhancing mood and well-being, promoting social interactions, alleviating pain and anxiety, and mitigating both physical and mental stress (Uvnäs-Moberg et al., 2019). Oxytocin is a hormone that is crucially produced throughout the process of labour and delivery, facilitating the bonding between the mother and the infant. In addition, it enhances skin sensitivity and promotes expansion of the mother's superficial blood vessels, so facilitating the newborn's warming process (Uvnäs-Moberg et al., 2019).

Prolactin, an additional hormone, plays a vital role in both reproduction and the synthesis of breast milk (Buckley, 2015). Prolactin levels experience a significant increase during the last stage of labour, just before to delivery. This spike is mostly attributed to the surges in oxytocin

and endorphins that occur during this period (Buckley, 2015). Prolactin stimulates the secretion of oxytocin, and its concentrations remain elevated for a prolonged period after childbirth, thereby augmenting the synthesis of breast milk and facilitating maternal adaptations such as reduced anxiety, aggression, and muscular tension, which might aid in maternal caregiving (Buckley, 2015). The hormones mentioned, including prolactin, endorphins, catecholamines, and oxytocin, exhibit mutual interactions throughout the perinatal phase, either promoting or suppressing each other's functions (Buckley, 2015).

Carbetocin, a pharmaceutical compound that activates oxytocin receptors, seems to be the most efficacious among these medications in reducing excessive bleeding after childbirth. Carbetocin, a synthetic long-acting octapeptide counterpart of oxytocin, was originally found in 1987. It has agonistic properties and shares clinical and pharmacological characteristics akin to naturally produced oxytocin. Uterine contractions begin within a time frame of less than two minutes after an intravenous infusion, and the duration of its effectiveness is around 40 minutes. Following intramuscular administration, the proportion of a drug that reaches systemic circulation, known as bioavailability, is 80%. In the context of the third stage of labour, the recommended dose is 100 micrograms. It has a safety profile that is similar to oxytocin and is well tolerated. However, it remains inaccessible in this particular context.

The hypothesis that oxytocin may be injected into the placental bed via the umbilical vein and delivered directly to the retro-placental myometrium has attracted a lot of attention. Consequently, the remaining part may be preserved while the section experiencing contractile failure is treated specifically. The trials of this therapy have shown inconsistent findings (Roy, et al., 2016). Although their meta-analysis showed that the reduction in retained placenta rates was not significantly different from expectant management (peto odds ratio 0.70, 95% confidence intervals 0.48 to 1.02), a recent Cochrane review concludes that the use of umbilical oxytocin is effective in managing retained placenta. The basis for this finding was derived from further information obtained from placebo-controlled randomised studies including umbilical oxytocin. These trials revealed a significant reduction in the need for manual placenta removal when umbilical oxytocin injection was administered (OR 0.59, 95% CI 0.43 to 0.82). The inadequate delivery of oxytocin to the retro-placental myometrium might be the underlying reason for the inconclusive results seen in randomised studies. Pipingas et al. conducted a study to investigate various strategies of injecting substances into the umbilical cord. They achieved this by injecting a radio-opaque dye into the placenta after it was delivered. It was shown that capillary filling occurred in only 60% of cases when oxytocin was administered directly into the umbilical vein after being diluted in 20–30 ml of saline. Following their experiments, they suggested administering oxytocin via a naso-gastric feeding tube in newborns, which had been put via the umbilical cord, after diluting it in 30ml of saline solution. The recommended procedure involves inserting a size 10 naso-gastric tube into the vein until it meets resistance, following cutting the chord to ensure a clean end for the tube. Subsequently, the tube is retracted by a distance of 5cm to allow for potential vein subdivisions prior to its insertion into the placenta. All patients who received this treatment exhibited full filling of their placental bed capillaries.

An further difficulty with the prior studies was that the oxytocin dosage was variable. Due to the absence of comparison studies assessing different oxytocin levels, the choice of dose has been relied on empirical study. Oxytocin has generally been delivered in studies at a dosage of 10–20 i.u., however there have been reports of dosages as high as 100 i.u. Published studies that used greater doses of oxytocin have consistently shown better success rates. Nevertheless, physicians exhibit reluctance in using elevated dosages due to the potential of inducing discernible alterations in the woman's blood pressure with the intravenous administration of as little as 5 international units (i.u.). While it is evident that oxytocin has the ability to traverse the placenta, the timing and extent of this process remain uncertain. An examination of a specific subgroup within the randomised trials from the Cochrane review suggests that dosages over 20 i.u. may lead to a 75% decrease in the need for manual placenta removal (Sandall, et al., 2016).

Oxytocin is very advantageous for women with labour dystocia. Both women who have given birth (parous) and women who have not given birth (nulliparous) may confirm this. A well administered oxytocin infusion will result in few adverse effects. Nevertheless, after the administration of oxytocin, notable complications have been documented in both the mother and the foetus. Consequently, oxytocin is often implicated in obstetric negligence lawsuits. Nearly 50% of all compensated obstetric lawsuit claims in the United States include allegations of inappropriate oxytocin administration. Oxytocin has just been classified as a high-alert medication by the Institute for Safe Medication in the United States. These drugs are associated with a greater potential for damage if they are taken improperly. The use of oxytocin over the specified dose recommendations is a probable cause for adverse outcomes in newborns, as shown by Sleep (2013). The administration of oxytocin is becoming more common, with around 20% of women who have given birth before and 50% of women who have never given birth expected to get it during childbirth.

Oxytocin has several physiological effects in the human body, such as triggering the letdown response in lactating women (Seelatha, et al., 2013). Oxytocin has several subtle effects on human behaviour as a hormone, nevertheless. Prior to participating in the observed behavioural framework, the hormone may establish a predisposition that influences most of these behaviours.

Oxytocin stimulates the mammary glands, causing the flow of milk into the subareolar sinuses for elimination. An infant's sucking at the breast generates a spinal nerve impulse that is sent to the hypothalamus. The stimulation causes regular episodes of action potential generation in the neurons responsible for oxytocin production. These episodes prompt the neurosecretory nerve terminals of the pituitary gland to release pulses of oxytocin. Oxytocin directly affects the myoepithelial cells around the milk cistern. This process induces the contraction of these cells, resulting in the expulsion of milk. Oxytocin is believed to have an indirect impact on milk production by affecting the prolactin hormone (PRL). The Fergusson response in males is associated with the hormone oxytocin.

Oxytocin facilitates uterine contractions and aids in cervical dilation during the second and third phases of labour. Oxytocin is a very efficient uterotonic medication that is often used in clinical settings to initiate labour. Oxytocin exerts its effects on an estrogen-primed uterus throughout the birth process. Nevertheless, several studies have raised doubts about the physiological significance of this hormone in the initiation of labour due to their inability to detect an increase in Oxytocin levels during the early stages of labour, even when using very sensitive testing. Furthermore, Thorpe and Anderson (2019) have shown that knockout mice missing the oxytocin receptor exhibit typical reproductive behaviour and parturition. In the first weeks of breastfeeding, the act of the newborn sucking triggers the production of oxytocin, which causes mild but sometimes unpleasant contractions that aid in the shrinking of the uterus. Oxytocin is essential for the process of milk ejection.

Use of Oxytocin in Management of Retained Placenta

Retained placenta, a disorder characterised by the failure of the placenta to be expelled naturally after delivery, presents substantial hazards to the mother's well-being, such as postpartum haemorrhage and infection. Retained placenta is a medical term used to describe the situation in which the placenta or its pieces are not expelled spontaneously after childbirth. The management of placenta removal usually includes medicinal or surgical procedures aimed at safely extracting the placenta and preventing potential problems like as infection or haemorrhage.Retained placenta care involves medicinal or surgical measures to address the condition where the placenta or placental fragments are not spontaneously evacuated from the uterus after childbirth. If this illness is not addressed, it might result in complications such as infection, haemorrhage, or other problems with the uterus (Fullerton, et al., 2013). The management strategy is contingent upon many elements, such as the patient's medical state, the clinical environment, and the resources at hand.

Healthcare practitioners may choose to observe and monitor the condition, particularly if the placenta has experienced partial detachment from the uterine wall. The patient is closely monitored for indications of infection or haemorrhaging. This strategy may be deemed appropriate if the patient's condition is stable and they are not exhibiting notable symptoms (Begley, et al., 2019). Manual extraction is a healthcare professional physically inserting their hand into the uterus to separate and extract the placental tissue that has not been expelled naturally. Typically, this procedure is carried out in a sterile environment and with suitable analgesia. Avoiding this surgery is crucial in cases when there is a suspicion of placenta accreta, a disorder characterised by improper attachment of the placenta to the uterine wall (Begley, et al., 2019).

Oxytocin, an essential hormone for inducing uterine contractions during childbirth, is often used in the treatment of retained placenta to aid in the separation and ejection of the placenta. Oxytocin, a hormone with the ability to induce uterine contractions, may be injected to stimulate the uterus and facilitate the expulsion of the retained placenta. This approach is particularly efficacious when the placenta remains connected to the uterine wall but has not yet completely detached. Oxytocin is a hormone and neuropeptide that has a vital function in several physiological processes, namely in reproductive and social behaviours. Oxytocin has

great significance in the realm of delivery and mother health. Oxytocin is the hormone that triggers uterine contractions during the process of childbirth. It has a crucial function in the advancement of labour by stimulating regular contractions of the uterine muscles, which facilitate the dilation of the cervix and finally result in the birth of the baby (Bernitz, et al., 2016).

Studies provide evidence for the efficacy of oxytocin in the treatment of retained placenta. In a research conducted by Bakri et al. (2010), it was shown that giving oxytocin via an intravenous route led to effective removal of the placenta in most instances, with very few negative consequences. Oxytocin's uterotonic effect facilitates uterine contractions, assisting in the separation and ejection of the retained placenta (Alfirevic et al., 2013). Oxytocin injection not only promotes uterine contraction but also decreases the need for manual removal of the placenta, a process linked to higher maternal morbidity risk (Begley et al., 2011). Oxytocin aids in the natural ejection of the placenta, reducing the need for intrusive procedures and ultimately enhancing the well-being of the mother.

Moreover, oxytocin has been shown to be both safe and well-tolerated when used for the treatment of retained placenta. A meta-analysis conducted by Tuncalp et al. (2013) determined that the administration of oxytocin did not result in a higher likelihood of negative outcomes for either the mother or the newborn. This emphasises the advantageous safety characteristics of oxytocin in the treatment of retained placenta. Oxytocin is essential in the treatment of retained placenta since it stimulates uterine contractions and aids in the ejection of the placenta. Research substantiates the efficacy and safety of this treatment, making it a viable therapeutic choice in obstetric practice. Nevertheless, the use of this treatment should be guided by specific patient characteristics and professional assessment, and more study is necessary to enhance its dosage and administration procedures.

Oxytocin also has a function in lactation. It stimulates the secretion of milk from the mammary glands in response to the baby's suckling. This phenomenon is referred to as the "let-down reflex." Oxytocin is often known as the "love hormone" because it plays a crucial role in fostering social bonding and attachment. It is linked to sentiments of trust, empathy, and emotional bonding among persons (Afzal, et al., 2019). Oxytocin may be provided to facilitate or enhance labour when spontaneous contractions are not advancing as anticipated. Intravenous administration of synthetic oxytocin is often used to replicate the natural secretion of the hormone in the body. This aids in enhancing contractions and promoting the expansion of the cervix (Afzal, et al., 2019).

Oxytocin injections are often used postpartum to facilitate uterine contraction and mitigate the likelihood of severe haemorrhaging. This is especially crucial during the "third stage of labour," which encompasses the expulsion of the placenta.Oxytocin may be used to stimulate uterine contractions and aid in the removal of retained placental pieces.Oxytocin may be administered to aid in the stimulation of milk ejection in nursing moms experiencing challenges with milk flow.

Oxytocin may be delivered by intravenous (IV) infusion, intramuscular (IM) injection, or intranasal spray, depending on the particular clinical scenario and desired outcome.Although oxytocin has several advantageous benefits, healthcare personnel must exercise caution in its administration to prevent possible consequences such as excessive stimulation of the uterus, which may result in hyperstimulation or rupture. Optimal dose and timing are crucial to guarantee the well-being of both the mother and the foetus. Oxytocin has a crucial role in birthing, nursing, and social bonding, making it a critical hormone for the health of both mothers and infants (Afshari, et al., 2018).

Implications to Midwives Practice

The implications of using oxytocin in the management of retained placenta for midwives' practice are significant. Firstly, midwives need to be well-versed in recognizing the signs and symptoms of retained placenta to initiate timely intervention. Understanding the risk factors and clinical presentation of retained placenta allows midwives to promptly assess and manage this obstetric complication. Secondly, midwives play a pivotal role in the administration of oxytocin for the management of retained placenta. They should be knowledgeable about the pharmacology of oxytocin, including its mechanism of action, dosage, and route of administration. This expertise enables midwives to safely and effectively administer oxytocin to stimulate uterine contractions and facilitate placental expulsion.

Moreover, midwives must be skilled in monitoring maternal and fetal well-being during oxytocin administration. Close monitoring of uterine contractions, maternal vital signs, and fetal heart rate is essential to identify any adverse effects or complications promptly. Midwives should also be prepared to intervene if hyperstimulation of the uterus occurs, necessitating adjustments to oxytocin dosage or discontinuation of the infusion. Additionally, midwives should provide comprehensive education and support to women undergoing oxytocin administration for retained placenta. This includes explaining the rationale for oxytocin use, discussing potential benefits and risks, and addressing any concerns or questions the woman may have. Empowering women with knowledge and understanding enhances their engagement in the decision-making process and promotes positive birth experiences.

Furthermore, midwives should collaborate closely with other members of the multidisciplinary healthcare team, including obstetricians, anaesthetists, and neonatologists, in the management of retained placenta. Effective communication and teamwork are essential to ensure coordinated care and optimal outcomes for women and their newborns. Overall, the use of oxytocin in the management of retained placenta underscores the crucial role of midwives in providing safe, evidence-based, and woman-centered care during childbirth. By maintaining competency in the administration of oxytocin, monitoring maternal and fetal well-being, providing education and support to women, and collaborating with the healthcare team, midwives can contribute to positive maternal and neonatal outcomes in cases of retained placenta.

CONCLUSION

The use of oxytocin in the management of retained placenta has significant implications for midwives' practice. Firstly, midwives need to have a thorough understanding of the signs, symptoms, and risk factors associated with retained placenta to ensure timely intervention. This knowledge enables midwives to promptly recognize and manage this obstetric complication. Secondly, midwives play a crucial role in the administration of oxytocin for the management of retained placenta. They must possess comprehensive knowledge of oxytocin pharmacology, including its mechanism of action, dosage, and route of administration. This expertise allows midwives to safely and effectively administer oxytocin to stimulate uterine contractions and facilitate placental expulsion.

Moreover, midwives must be adept at monitoring maternal and fetal well-being during oxytocin administration. Close monitoring of uterine contractions, maternal vital signs, and fetal heart rate is essential to identify any adverse effects or complications promptly. Midwives should also be prepared to intervene if hyperstimulation of the uterus occurs, requiring adjustments to oxytocin dosage or discontinuation of the infusion. Additionally, midwives should provide comprehensive education and support to women undergoing oxytocin administration for retained placenta. This includes explaining the rationale for oxytocin use, discussing potential benefits and risks, and addressing any concerns or questions the woman may have. Empowering women with knowledge and understanding enhances their engagement in the decision-making process and promotes positive birth experiences.

Furthermore, effective communication and collaboration with other members of the healthcare team, including obstetricians, anaesthetists, and neonatologists, are crucial for optimal outcomes. By working together cohesively, midwives can ensure coordinated care and support for women experiencing retained placenta. Overall, the use of oxytocin in the management of retained placenta underscores the indispensable role of midwives in providing safe, evidence-based, and woman-centered care during childbirth. Through ongoing education, skill development, and collaboration with the healthcare team, midwives can contribute to positive maternal and neonatal outcomes in cases of retained placenta.

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