Nurses Role in Patient-Centered Care During Administration of Oxytocin

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Nurses play an important role in ensuring that patients and caregivers can independently decide whether to begin or continue a health treatment. The process involves obtaining informed consent, which requires healthcare providers to deliver specific and understandable information about a planned health assessment or treatment, and to empower individuals to make informed decisions about care (Strini et al., 2021). Information provided should be evidence-based, culturally appropriate, and personalized (Robinson et al., 2023). The Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) outlines the concept of shared decision making in patient-centered care, which requires clear communication between patient and provider (AWHONN, 2019). Often within the obstetric healthcare environment, exogenous (synthetic) oxytocin is prescribed to induce or strengthen contractions during labor, aid in delivery of the placenta, and/or prevent postpartum hemorrhage (Osilla & Sharma, 2023). Oxytocin is a uterotonic agent, meaning it stimulates uterine muscle contraction to constrict placental blood vessels and decrease the flow of blood to the uterus (McGovern, 2019). As part of patient-centered care, obstetric nurses have a responsibility to provide education to patients in the antepartum (pregnancy) and intrapartum (labor & delivery) periods on exogenous oxytocin, including the physiological effects, indications for administration, and potential for adverse maternal and fetal effects during the intra and postpartum periods.

History and Physiological Effects of Oxytocin

Endogenous oxytocin is a hormone created in the hypothalamus, then stored and secreted from the posterior pituitary gland (Osilla & Sharma, 2023). Exogenous oxytocin, the synthetic version of the hormone, was first created in the early 1950s by biochemist Sir Vincent du Vigneaud and colleagues (Rashidi et al., 2022), and causes uterine muscle contractions by

binding to uterine receptors, creating a positive feedback loop, which can either initiate or increase uterine contractility (Osilla & Sharma, 2023). An increase in contractions moves the fetus down into the birth canal to dilate the cervix (open) and achieve 100% effacement (thinning) to allow for a safe transition from the uterus to the extrauterine environment (Elsevier, 2024). Thorough nursing care of the intrapartum patient includes knowing what physiological effects a medication will have. Understanding oxytocin's mechanism of action improves the obstetric nurses practice by ensuring patient safety through adequate knowledge on the expected and adverse effects.

Indications of Administration

Exogenous oxytocin is indicated for use within obstetric care during the intrapartum and postpartum (after delivery) time periods. During intrapartum, oxytocin is administered to induce labor, or augment (strengthen) the force of contractions. In the postpartum period, also known as the fourth trimester, oxytocin is administered to aid in both the successful delivery of the placenta, and to help the uterus contract down, to control postpartum bleeding and prevent hemorrhage (Osilla & Sharma, 2023).

Induction of labor with oxytocin is the stimulation of uterine contractions before spontaneous (natural) labor begins, through intravenous or intramuscular injection. From 1990-2018, the rate of induction in the United States has more than doubled, from 9.5% to 27.1%, which is why it is so important for nurses to have extensive knowledge about the medication (Rashidi et al., 2022). Two of the conditions that indicate induction include: mothers with prenatal complications (preeclampsia, maternal diabetes, and premature rupture of membranes) and those with no uterine activity at least 39 weeks gestation requiring stimulation to begin labor (Osilla & Sharma, 2023). Although elective induction (not medically necessary) is sometimes

offered to prenatal patients, AWHONN advocates against it before 39 weeks gestation and supports careful risk vs benefit analysis of induction (AWHONN, 2019). Another indication for oxytocin is to enhance or speed up contractions, also known as augmentation. To facilitate successful contraction augmentation, oxytocin is administered via intravenous catheter continuously and at a periodically increased rate until contractions are at the provider preferred level (Rashidi et al., 2022). While the rate, duration and protocol vary across healthcare facilities, the required close observation by nursing staff remains consistent.

Postpartum hemorrhage is classified as blood loss greater than 500 milliliters after vaginal birth, or 1000 milliliters after cesarean. It is the fourth leading cause of maternal mortality in the United States, with an estimated 73% of those deaths classified as preventable (McGovern et al., 2019). Considering these statistics, the World Health Organization asserts, “The use of oxytocin is recommended for the prevention of postpartum hemorrhage for all births” (WHO, 2020). Continued contraction of the uterus before and after delivery of the placenta lowers the risk for uterine atony (insufficient uterine muscle contraction), which is the leading cause of postpartum hemorrhage. Oxytocin stimulates uterine contraction, which constricts the placental blood vessels to decrease blood flow to the uterus, thus minimizing the threat of excess blood loss (McGovern et al., 2019).

Nurses have an invaluable duty of ensuring patient safety during oxytocin administration. Close monitoring of blood pressure, fluid intake, respiratory rate, pulse rate, along with the frequency, duration, and intensity of contractions, and their correlation with the fetal heart rate, will indicate whether the oxytocin is being well-tolerated by both mother and fetus. As a high alert medication, oxytocin requires two independent nurse checks of the patient, medication,

dose, time, route, and reason to provide patient-centered care and safety for mother and baby (Robinson et al., 2023).

Potential Maternal Complications

Exogenous oxytocin offers many lifesaving benefits to peripartum patients, however there are also some serious risks. According to the Saunders' Nursing Drug Handbook, common side effects include increased heart rate, irregular heat beat, hypotension, nausea, and vomiting. Oxytocin is contraindicated for those with uterine activity that fails to progress, incongruence between shape and size of fetal head with maternal pelvis, fetal distress, excess amniotic fluid, placental problems, or conditions that increase risk for placental rupture (history of cesarean delivery, traumatic delivery or overdistended uterus) (Saunders, 2024). Of all the risks associated with oxytocin, three of the more threatening are postpartum hemorrhage, water intoxication, and postpartum depression.

Even though oxytocin is associated with preventing excess bleeding and treating postpartum hemorrhage, it can also cause it. Prolonged exposure to oxytocin has the opposite effect on uterine contractility by desensitizing the receptors and overstimulating the uterine muscles (Rashidi et al., 2022). In other words, after a long period of strong, regular contractions, the uterus gets worn out and becomes less responsive to the chemical signals. The inadequately contracting uterus becomes "boggy" with atony which greatly increases the risk for postpartum hemorrhage. There have also been reports of subarachnoid hemorrhage following oxytocin administration, although less common than blood loss from the uterus (Elsevier, 2024).

If oxytocin is given in doses that are either too large or too fast, alongside oral fluids, it can create an antidiuretic effect in the body, causing water-intoxication and possible seizures from the increase in blood pressure (Osilla & Sharma, 2023). Normal administration of oxytocin

calls for dilution in a low sodium solution like Lactated Ringer's, which are sometimes required to be infused for a long period of time if labor is not progressing (Elsevier, 2024). Close monitoring of maternal intake of fluids during oxytocin administration by nursing staff is crucial for maternal and fetal safety.

Research that correlates postpartum depression and anxiety to exogenous oxytocin use are limited, however multiple studies do show a strong connection. Physiologically, oxytocin causes changes in central nervous system signaling which might lead to postpartum depression and anxiety (Rashidi et al., 2022). Normally, oxytocin is released in response to positive stimuli (hugging, touching, cuddling), which has earned it the moniker of "love hormone". Prolonged exogenous oxytocin exposure can lead to receptor desensitization in both the uterine muscles and the brain, which could inadvertently increase the risk for postpartum depression (Monks & Palanisamy, 2021).

The research on potential serious complications of oxytocin impacts the nursing practice by highlighting what types of specialized training is necessary for all nurses caring for a patient during administration. Obstetric patient care requires a highly alert nursing staff providing close observation of every patient given oxytocin.

Potential Fetal Complications

Unfortunately, oxytocin also carries major risks for the fetus. Slowed heartbeat, irregular heart contractions, physical trauma, brain damage, low APGAR (fetal health scoring system) scores, and neonatal jaundice have been observed with maternal oxytocin administration (Elsevier, 2024). Prolonged high intensity maternal contractions may lead to fetal distress and hypoxia by limiting blood supply to the placenta (Wang et al., 2021). An article featured in *Neuroscience and Biobehavioral Reviews* entitled, "Peripartum effects of synthetic oxytocin:

The good, the bad and the unknown", describes a possible link between intense maternal contractions and impaired gas exchange between mother and fetus leading to trauma, and a lack of both oxygen and blood flow. The article speculates that these complications (and many other adverse effects of oxytocin) might increase the risk of the infant developing Autism Spectrum Disorder (Rashidi et al., 2022).

Considering the potential harm oxytocin can cause to the fetus, obstetric nurses must have a clear and thorough understanding of fetal monitoring during labor, and work quickly to alleviate maternal complications. A peripartum patient requires awareness and care for two individuals, with patient centered care at the forefront.

Conclusion

Exogenous oxytocin is a valuable medication for the induction and augmentation of labor, as well as the prevention of postpartum hemorrhage. However, those benefits also carry some substantial risks to both mother and fetus, which is why oxytocin should only be administered when medically necessary and adjusted or discontinued if complications arise. This research applies to evidence-based nursing practice by preparing nurses to be their patients' biggest advocate within the maternity setting. As oxytocin use continues to rise, nurses who care for patients receiving it must provide thorough patient education, support shared decision making between patient and provider, and evaluate the patient's understanding of informed consent. Maternity and obstetric nurses have an obligation to their patients, which includes mother and fetus, and must use their extensive knowledge about exogenous oxytocin to protect and advocate for all who experience pregnancy and birth.

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