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Oxytocin

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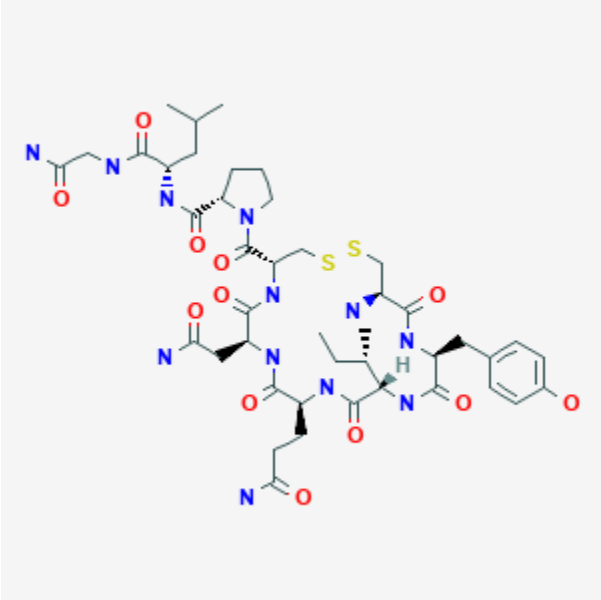

Drug Levels and Effects

Summary of Use during Lactation

Oxytocin is an essential lactation hormone released during breastfeeding that appears to have calming effect on the mother.[1] Administration of exogenous oxytocin to mothers having difficulty in breastfeeding has not been clearly shown to have a beneficial effect on lactation success or in the treatment of breast engorgement. It might be of benefit in women who have lost the neuronal connection between the breast and hypothalamus. Effects on the infant are unlikely when given during breastfeeding. Numerous studies suggest that oxytocin given during labor can negatively affect breastfeeding, possibly by reducing sucking behavior in the newborn in a dose-dependent manner, although study methodology and consistency has varied considerably.[2][3][4][5][6][7][8][9][10][11][12][13] One study found that all rhythmic reflexes, the antigravity reflex, and total primitive neonatal reflexes were inhibited by intrapartum oxytocin administration, unrelated to dose, which could adversely affect breastfeeding.[14]

Drug Levels

Maternal Levels. Relevant published information was not found as of the revision date.

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants

Relevant published information was not found as of the revision date.

Effects on Lactation and Breastmilk

Intranasal oxytocin is reportedly used by some midwives in Switzerland as a galactogogue.[15]

A small study found no difference in symptoms between subcutaneous oxytocin 2.5 international units daily and placebo after 3 days of treatment for breast engorgement.[16][17]

An early randomized, placebo-controlled trial used oxytocin nasal spray in the mothers of newborns, but lactation management fell far short of what is considered acceptable nowadays. The study found that the spray might be useful in decreasing breast engorgement slightly in the mothers of fullterm infants, but no difference was found in the average infant weight loss between birth and day 4 in the oxytocin and placebo groups.[18]

Two similarly designed trials studied oxytocin nasal spray in mothers of preterm newborns who were pumping milk for their infants. The first studied mothers of infants born before 38 weeks and used a total of 3 units of intranasal oxytocin (Syntocinon-Sandoz, 40 units/mL) before pumping each breast for10 minutes a breast pump four times daily. Among primiparous mothers, milk production during days 2 to 5 days postpartum was 1964 mL in those who used oxytocin and 510 mL in those who received placebo spray. Because of the large and statistically significant effect of oxytocin among primiparous women, the trial was stopped after only 8 primiparous mothers had been studied. No statistically significant difference was found between oxytocin and placebo among 4 multiparous women who were attempting to breastfeed for the first time. The paper did not report giving the mothers any instructions in lactation technique.[19]

Fifty-one mothers who delivered an infant of less than 35 weeks gestation were studied. Twenty-seven mothers used 4 units of intranasal oxytocin (Syntocinon-Novartis, 40 units/mL), and 24 mothers received an identical placebo spray before pumping with a breast pump. All mothers were given instructions on using hand massage before pumping and advised to pump every 3 hours. No difference in milk production over the first 5 days postpartum was found between mothers who received oxytocin (median 667 mL) and placebo (median 530 mL), although women receiving oxytocin produced slightly more milk on day 2 of the study. Parity had no effect in this study.[20]

Several factors might explain the differences in findings between the studies. Because of the great interpatient variability in milk production documented in the recent study and the small number of patients in the first study, the finding in the earlier study may have been due to chance. A 50% higher dose of oxytocin was used in the first study, which may have caused a greater effect. Another plausible explanation is the good lactation support given to mothers in the recent larger study that seemed to be lacking in the early study.

Two case reports indicate that oxytocin nasal spray may facilitate letdown in tetraplegic women who have lost the neuronal connection between the nipple and the hypothalamus.[21]

xxx Logistic regress of data from 585 mothers who had epidural analgesia during labor found that mothers who had received exogenous oxytocin had a 3.3 times greater risk of delayed onset of lactation than women who did not.[7]

An observational study of 20 primiparous women found that those who were exclusively breastfeeding at 3 months (63%) had received a lower dose of oxytocin during labor (mean total dosage 1363 mIU) than those who were not exclusively breastfeeding (mean total dosage 3088 mIU). This result was attributed to an inhibitory effect on neonatal sucking by the infant caused by oxytocin.[2]

A small, nonrandomized cohort study found that the newborn infants whose mothers received synthetic oxytocin to induce or maintain labor had a decreased level of prefeeding organization one hour after birth.[6]

A retrospective cohort study in Spain compared breastfeeding outcomes between mothers who received oxytocin during labor (n = 189) and mothers who did not, including those who delivered via elective Cesarean section (n = 127). Mothers who received oxytocin during the first and second stages of labor had a 45% increased risk of bottle feeding and a 129% increased risk of breastfeeding discontinuation by 3 months of age. Effects were most pronounced in women under 27 years of age.[5]

A small prospective study in California compared women who received an epidural infusion of fentanyl and ropivacaine to mothers who did not receive an epidermal during labor. All mothers had normal vaginal deliveries and their infants had 1 uninterrupted hour of skin-to-skin contact immediately postpartum. The study found inverse relationships between the amount of fentanyl and the amount of oxytocin received during labor and the time of the first suckling. Because women who received more fentanyl also tended to receive more oxytocin, the study could not clearly separate the effects of the two drugs.[9]

A small prospective cohort study in Spain followed mothers by telephone postpartum to determine their breastfeeding status. Mothers who had received oxytocin during labor were breastfeeding at a similar rate as those who had not at 1, 3 and 6 months postpartum.[22]

A nonblinded, nonrandomized study compared breastfeeding among the infants of mothers who received oxytocin during delivery (n = 70) and those who did not (n = 90) in two Iranian hospitals. Mothers were primiparous and infants were full term. Infant breastfeeding behavior was assessed to be either successful or unsuccessful within 2 hours of delivery. Infants whose mothers received oxytocin were judged to successfully breastfeed 48.6% compared to 82.2% among the infants of mothers who did not receive oxytocin. Use of opiate pain relievers in the two groups was not stated.[23]

A retrospective cohort study compared breastfeeding results between women who did and did not receive oxytocin during labor. After correcting for confounding factors, the study found that exogenous oxytocin impaired breastfeeding during the first hour postpartum, but not at 3 months postpartum. High pregestational body mass index was the best predictor of an impaired third month's postpartum breastfeeding.[12]

A retrospective case-control study conducted in two hospitals in central Iran compared breastfeeding behaviors in the first 2 hours postdelivery by infants of 4 groups of primiparous women with healthy, full-term singleton births who had vaginal deliveries. The groups were those who received no medications during labor, those who received oxytocin plus scopolamine, those who received oxytocin plus meperidine, and those who received oxytocin, scopolamine and meperidine. The infants in the no medication group performed better than those in all other groups, and the oxytocin plus scopolamine group performed better than the groups that had received meperidine.[13]

A prospective cohort study in Spain found no relationship between oxytocin dose dring labor or postpartum with the duration of breastfeeding. However, elective cesarean section without oxytocin resulted in the greatest risk of stopping exclusive breastfeeding.[24]

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Substance Identification

Substance Name

Oxytocin

CAS Registry Number

50-56-6

Drug Class

Breast Feeding

Lactation

Oxytocics

Pituitary Hormones, Posterior