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Adverse Effects of Oxytocin Hormone on Human Health

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Abstract

Oxytocin is a hormone that is secreted by the posterior lobe of pituitary gland. The main function of oxytocin hormone is to contract and relax muscles during milk lay down and childbirth . Oxytocin also available in synthetic form to treat and manage varies conditions and abnormalities. It is only prescribed for therapeutic uses . Now days the trend of using oxytocin in lactating animals like cattle and buffalo on regular basis for milk lay down increasing. Especially in Asian countries like in Pakistan and in India. As oxytocin hormone help in lay down 90% of milk .and, it is also used on humans during childbirth. The abuse may cause severe problems in both in humans and in animals. The problems include abortion, repeat breeding, premature expulsion of the fetus and others . In this article, the conditions and Negative impact described briefly.

Key words: Abortion, Hormone, Oxytocin, Abuse, postpartum bleeding, puberty.

Introduction

Oxytocin derived from a Greek word that means quick birth or rapid birth. Oxytocin (OT) is chemical structure, a neuropeptide that is synthesized from hypothalamus as a long protein chain of 125 amino acids. The Oxytocin stored in posterior lobe of pituitary gland (Nishimori K et al., 2008; Lee HJ et al., 2009; Feldman R et al., 2012; Neumann ID et al., 2008). Oxytocin (OT) is released into the blood stream when the body is triggered by certain natural signals. Besides the brain, body also produces oxytocin by other places such as uterus, ovary, testis, blood vessels, and heart (Neumann ID et al., 2008). Research shows that when a baby suckles, which helps release milk from the mother's breast J M et al (Mc Neilly et al., 1983; Johnston L., 1986). Synthetic source of Oxytocin (OT) is the drug of choice for milk let down after giving birth (Buhimschi CS et al., 2004). Oxytocin injection used in mulch animals for milk let down (Buhimschi CS et al., 2004; Saji R et al., 1980; Ballou LU et al., 1993; Bansode PD et al., 1996; Knight CH et al., 1994). Oxytocin is hormone that helps in the reproduction cause uterine contraction when estrogen levels are high such as during ovulation and at the time of birth, the uterus responds more strongly to oxytocin and contracts more. During sexual activity, oxytocin helps the contracts the uterus, which supports the movement of sperm into the fallopian tubes. During copulation and during childbirth, oxytocin helps the uterus push the baby out. These actions of oxytocin play a key role in fertilization and expulsion of fetus. Oxytocin released in blood stream in both male and female during orgasm (Katzung BG & Trevor AJ, 2015; Stubb's TM, 2000; Shyken JM & Petrie RH, 1995); Nichols FH & Welling E, 1997; Willcourt RJ et al., 1994; Assad N et al., 2016).

Adverse Effects and Drug Interactions of Oxytocin

oxytocin administration cause adverse effect such as localized redness at the injection site ,enhanced and more frequent urine contractions,nausea,vomiting abdominal pain ,and decreased appetite . Serious complications that warrant close monitoring include cardiac arrhythmias,

convulsions, anaphylactic reactions, altered mental status, hallucination ,significant ,
hypertensions ,and visual disturbance . (Simpson KR.,2020).

Drug –Drug Interaction

Vasoconstrictors. Administration of oxytocin after prophylactic use of vasoconstrictors during caudal block anesthesia has been linked to severe hypertension .in this case careful blood pressure monitoring is required to reduce the risk of hypertensive complications.

Cyclopropane . When used with cyclopropane anesthesia oxytocin oxytocin may alter cardiovascular responses leading to hypotension, sinus bradycardia and abnormal atrioventricular rhythms .continuous monitoring of maternal heart rate and cardiac rhythm is recommended.

Oxytocic drugs .concurrent use of oxytocin with other oxytocic agent like carboprost or misoprostol may produce additive effect and result in excessive urine contractions.

QT-prolonging drugs intravenous bolus administration of oxytocin may cause temporary prolongation of the QTc interval, increasing the risk of cardiac arrhythmias.

(Charbit, B., and Funck-Brentano., et al., 2004; Li, M., Ramos, L. G.,et al 2017)

Tranexamic acid .Intravenous co-administration of oxytocin with tranexamic acid may reduce oxytocin contraction potentially leading to sub therapeutic effects. Mixed these agent should be avoided until further studies clarifies the clinical significance of this interaction. (Lambert, P., Tomazzini, A., Wright, P., et al 2023).

Conditions developed in humans by abuse of oxytocin hormone

Function : oxytocin hormones that is released from the posterior pituitary lobe of pituitary gland of brain. It help in regulating different functions like uterine contraction during childbirth and breast muscle contraction for milk lay down (kimara et al ;1992 and Ellis JA et al; 2019).the synthetic oxytocin hormone used across the world. In Pakistan it is validated by the Pakistan food and drug administration Act (FDA). It is used in both in humans and in animals. It is used to treat and manage varies conditions like parturition promotion or induction, hormonal imbalance and for other therapeutic uses (stubbs Tm et al;2000 ,Shyken JM and Petrie RH et al;1995 and

welling E et;1997) . In animals oxytocin used for milk lay down in cattle and buffalo (Belo CJ and Bruckmaier ET;2010).

Conditions developed are:

Like the normal use of oxytocin hormone is normal but its abuse or excessive use may develop various conditions . In Pakistan the oxytocin hormone injection used without prescription and administered by local farmers for proper milk lay down on daily basis in the farms (Mustafa et al;2008). By this practice the certain conditions developed like retained placenta, Abortion, follicular ovarian cyst, leutal cyst, repeat breeding and others (Mustafa et al;2008, Qureshi M and Ahmed N ET;2008 and Rigby SL Barhoumi Et Al;2002).

In humans the synthetic oxytocin hormone used during childbirth for easy management. The adverse effects of oxytocin during childbirth may increase the risk of asthma and obstruction of the airway and disturbance in respiratory system (Lin MC et al;2007,shimo T et al;2006,spear FD and Liu W et;1994,Morriss WW et al;1994,Maycock EJ and Russell WC et ;1993 and marmo et al; 2012). Some studies show that the risk of allergic reaction become higher in those female in which the oxytocin hormone injected during childbirth or delivery (Mertes et al; 2011). Oxytocin hormones are mostly ingested and secreted along with milk .it is degraded by gut enzymes and that is why it is not reached at blood circulation. However, it is believed that synthetic oxytocin containing milk is harmful for the human health (Faraz et al;2020). Milk containing synthetic source of oxytocin hormone may cause and increase the risk of early puberty. Like in normal person the puberty age in females is 16 year that can be disturbed by oxytocin and after oxytocin the puberty take place at 10 years of age , Breast enlargement even in boys, hearing imbalance and weak eye sight in children (Assad et al;2016,Faraz et al;2020 and Pullulhandam et al;2016).

Conditions are :

1. Weak eye sight
2. Hearing disabilities
3. Early puberty
4. Allergic reactions

5. Breast enlargement
6. Milk not lay down without the oxytocin in milk animals
7. Representative disorders in animals like : cyst, repeat breeding and others

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