

Hormones Of Posterior Pituitary

OXYTOCIN

VASOPRESSIN

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OXYTOCIN

Biosynthesis

- Synthesized as cell bodies of Para ventricular nucleus & supraoptic nucleus of hypothalamus.
- Precursor broken down to active hormone & neurophysin complex by proteolysis.
- Packaged into secretory granules by oxytocin-neurophysin complex.

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.....*Biosynthesis*

- Secreted from nerve endings in posterior pituitary gland (neurohypophysis)
- Oxytocinergic neurons project to hypothalamus, brainstem., spinal cord.
- Luteal cells of ovary, uterus & fetal membranes synthesize oxytocin.

Oxytocin Secretion

- Sensory stimuli from cervix, vagina & breast suckling.
- ↑↑ Expulsive phase triggered by sustained distension of uterine cervix & vagina.
- Estradiol ↑secretion.
- Ovarian polypeptide relaxin inhibit release.
- Pain, dehydration, hemorrhage ↑ oxytocin.

Physiological Role

Uterus

- ↑ force & frequency of contractions.
- Very low level of motor activity in first two trimesters.
- 3rd trimester – spontaneous motor activity progressively ↑ & sharp rise initiates labor & delivery.
- Exogenous oxytocin can initiate rhythmic contractions.

.....Physiological Role

- 8 fold ↑ in uterine sensitivity in last 9 wks, accompanied by 30-fold ↑ in oxytocin receptors between early pregnancy & early labor.
- Oxytocin antagonist ATOSIBAN suppresses preterm labor.

Breast

- Role in milk ejection.
- Breast suckling or manipulation induces oxytocin release.
- Contraction of myoepithelium surrounding areolar channels in mammary gland, forces milk into large collecting sinuses.

Oxytocin - MOA

- Specific G protein-coupled membrane receptors related to V_1 a & V_2 Vasopressin receptors.
- Human myometrium – receptors coupled to Gq & G11, activation leads to generation of IP_3 .
- I/C Ca^{++} mobilization from stores.
- Activation of voltage sensitive calcium channels.
- No. of receptors & myometrium sensitivity \uparrow late in gestation.
- Labor initiation & postpartum uterine involution.
- \uparrow Local prostaglandins, uterine contractions.

Clinical Uses Of Oxytocin

- Induction of labor
- To induce or augment labor in pregnant women.
- Premature rupture of membranes.
- Intrauterine growth retardation.
- Placental insufficiency (diabetes, preeclampsia or eclampsia).
- Before induction, rule out contractions
 - Abnormal fetal position,
 - Evidence of fetal distress
 - Placental abnormalities
 - Previous uterine surgery.

Oxytocin is the drug of choice for induction of labor

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Oxytocin (Pitocin, Syntocinon)

- i.v. infusion of diluted solution 10 mU/ml.
 - Initial dose 1 mU/min, to ↑ 1 mU/min every 30-40 minutes.
- Or
- 6 mU/min & ↑ 2 mU/min at 20 min intervals, higher dose ↓ rate of CS.
 - If dose of 30-40 mU/min fail to initiate labor, higher rates are unsuccessful.
 - As labor progresses, dose of oxytocin ↓.

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Monitoring

- Presence of physician.
- Mother & fetus monitoring – fetal & maternal heart rate, B.P. & strength of contractions.
- If uterine hyper stimulation – discontinue oxytocin.
- Short half-life – 3 minutes.
- Infusion of ≥ 20 mU/mt \downarrow free water clearance by kidney.
- Water intoxication may result in convulsions, coma & death.

OXYTOCIN

- Augmentation of labor.
- In hypotonic contractions in dysfunctional labor (nulliparous i.v. infusion 10 mU/min.)
- Over stimulation complications
 - Trauma of mother
 - Trauma of fetus
 - Uterine rupture
 - Compromised fetal oxygenation
- Useful in prolonged latent phase of cervical dilation or arrest of dilation.

OXYTOCIN

- Epidural anesthesia impairs endogenous oxytocin release during second stage of labor.
- Oxytocin – third stage of labor
- Immediately after delivery to maintain uterine contractions & tone to ↓ incidence & extent of hemorrhage.
- 20 mU diluted in 1 litre of i.v. solution, infused rate of 10 ml/min for a few minutes.
- Then, ↓ infusion rate 1-2 ml/min until mother transferred to postpartum unit.

THANK YOU