

Posterior pituitary hormones Posterior pituitary gland

- oThe posterior pituitary consists mainly of neuronal projections (axons) extending from the supraoptic and paraventricular nuclei of the hypothalamus.
- oHypothalamic stimulation can also be produced by other factors;
- o In lactating women, genital stimulation.
- oVasopressin receptors : oV1A ,V1B and V2 receptors

Effects of Vasopressin

- 1.On the kidneys :
 - oADH increase the permeability of the collecting ducts of the kidneys , so water enter the hypertonic interstitium of the renal pyramids
 - oSo that the urine become concentrated and its volume decrease [antidiuretic effect]
 - oThe overall effect is retention of water in excess of solute , so the effective osmotic pressure of the body fluids is $\uparrow$.
 - oA moderate $\uparrow$ in the [ECF] volume stimulate these receptors $\rightarrow$ impulses pass from them via vagi $\rightarrow$ to the nucleus of tractus solitarius , an inhibitory pathway project from this nucleus to the caudal ventrolateral medulla , which stimulate SON $\rightarrow$ ADH release.
- the number of oxytocin receptors in the uterus
 - oOxytocin plays an important role in initiating the labor , and its secretion is increased during it , which is essential for delivery of the baby and expulsion of the placenta
- [3] Sperm transport :
 - oThe transport of sperms in the females genitals tract depends not only on the motility of the sperms but also on uterine contractions.

Synthesis

- oADH mainly in the SON, and oxytocin mainly in the PVN

ADH hormone

Vasopressin: Cys–Tyr–Phe–Gln–Asn–Cys–Pro–Arg–GlyNH₂

Stimulates of touch receptors around the nipple, with suckling result in discharge of impulses that activate the PVN in hypothalamus, this stimulate release of stored oxytocin in the posterior pituitary.

OXYTOCIN Oxytocin: Cys–Tyr–Ile–Gln–Asn–Cys–Pro–Leu–GlyNH₂

Introduction;

- oPolypeptides 9
- oSecreted mainly by the paraventricular.
- o When oxytocin is secreted in response to suckling or by conditional responses, it causes contraction of myoepithelial cells lining these small ducts, forcing the milk into large ducts.

[2] contraction of the smooth muscles of the uterus :

- oOxytocin causes contraction of the smooth muscles of both the pregnant and non-pregnant uterus
- oThe sensitivity of the uterine muscle to oxytocin is increased by estrogen and inhibited by progesterone.
- o Sensory receptors in the nipple transmit impulses to the spinal cord via afferent neurons.
- o If suckling continues, new oxytocin is synthesized in the hypothalamic cell bodies, travels down the axons, and replenishes the oxytocin that was secreted.

[4] in males :–

- oFunction of the oxytocin in males it may causes discharge of sperms from the seminiferous tubules and the epididymis to the vas deferens

Thank you

References

- oGuyton
- oConsciseo nephrogenic diabetes insipidus; Symptoms of [DI]
- oPolyuria:
 - o excretion of large amount of urine (can reach 23L/day) the urine is colorless & diluted.
- o Vasopressin secretion is regulated by osmoreceptors located in the anterior hypothalamus .in ECF volume , this result in.
 - $\uparrow$ Reduction in Na⁺ concentration, & osmolarity of the[ECF] decrease.

Regulation of Oxytocin Secretion

Several factors causes the secretion of oxytocin from the posterior pituitary, including;

- o suckling.
- o These axons release peptide hormones into the capillaries of the hypophyseal circulation.

Control of vasopressin

- oA–Osmotic stimuli;
- oWhen the osmotic pressure of the plasma is increased, vasopressin secretion is increased.

The high pressure receptors:

- $\uparrow$ Arterial baroreceptors in the carotid sinus and aortic arch act in a similar way .as low pressure receptors .Are located in the atria , great veins and pulmonary vessels .

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