

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.
- Hypothalamic stimulation can also be produced by other factors;
 - o In lactating women, genital stimulation.
- Vasopressin 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 $\uparrow$.
 - A 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
 - oVasopressin: $\text{Cys-Tyr-Phe-Gln-Asn-Cys-Pro-Arg-GlyNH}_2$
 - oStimulates 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: $\text{Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-GlyNH}_2$
 - 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
- oConscienceo 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.
 - oReduction in Na^+ concentration, & osmolarity of the[ECF] decrease.
- Regulation of Oxytocin Secretion
 - oSeveral 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:
 - oArterial 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 .