

The Posterior Pituitary **(Neurohypophysis)**

Objectives:

To study the posterior pituitary hormone secretion regarding chemistry, control, effects and pathophysiology.

It secretes 2 Hs which are synthesized by the hypothalamus and are transported into the nerve endings in the posterior pituitary, where upon appropriate stimulation, these hormones are released into the circulation:-

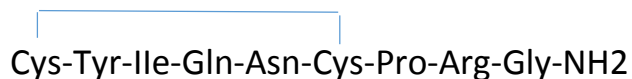
- 1. Oxytocin**
- 2. Antidiuretic H. (ADH), “ Vasopressin ”**

Each of them is a nonapeptide.

ADH (Arginine Vasopressin):



Oxytocin:



Oxytocin

Its secretion is stimulated by neural impulses resulting from nipple stimulation, vaginal and uterine distension, and by oestrogen.

While progesterone inhibits oxytocin production.

Effects of OXYTOCIN

Women : - Causes contraction of uterine smooth muscle. Thus, it is used therapeutically for the induction of labour.

Also it stimulates the contraction of myoepithelial cells surrounding the mammary alveoli promoting milk ejection from the breast.

Men:- not clearly known yet

HOWEVER, Current evidence suggests that oxytocin is involved in facilitating sperm transport within the male reproductive system.

It may also have effects on some aspects of male sexual behavior.

Antidiuretic H. (ADH), “ Vasopressin ”

ADH secretion is stimulated by:-

- 1. Increased plasma osmolality**
- 2. Physical stress**
- 3. Emotional stress**
- 4. Pharmacological agents:-**

Acetylcholine, Nicotine, Morphine

Effects of ADH:

Acts on the distal convoluted tubules and collecting ducts of the kidneys causing water reabsorption by the renal tubules, permitting osmotic equilibrium of the cells of interstitium.

Pathophysiology

Diabetes Insipidus: Deficiency of ADH or its action leads to Diabetes Insipidus (DI) which is characterized by excretion of large quantities of extremely diluted urine (of very low specific gravity).

DI could be:

1. Cranial (primary) DI:

Due to defective ADH secretion

2. Nephrogenic (Secondary) DI:

ADH is normally secreted but, either there is:

A: Hereditary Nephrogenic DI due to an inherited defect in ADH receptors.

or

B: Acquired Nephrogenic DI due to an acquired damage in ADH receptors.

3. Dipsogenic diabetes insipidus (Psychogenic polydipsia):

There is impairment of renal response to ADH due to prolonged over consumption of water.

Inappropriate ADH secretion:

Occurs with ectopic ADH productions by a variety of tumours (usually lung tumours).

It can also occurs in association with brain diseases, pulmonary infections and hypothyroidism