

HPA AXIS

Hypothalamus

- Produces Corticotropin Releasing Hormone (CRH)

Anterior Pituitary

- Produces Adrenocorticotrophic Hormone (ACTH)

Adrenal Glands

- Produce Cortisol (synthesized in Zona Fasciculata)

- Normal Physiology:
- Hypothalamus secretes CRH in times of stress (usually indicated by ↑ Norepinephrine) which acts on the anterior pituitary which produces ACTH, which targets the adrenal glands and they release cortisol.

Cushing Syndrome:

- Usually caused iatrogenically, is characterized by having EXCESSIVE CORTISOL
 - Round face (Moon facies)
 - Buffalo hump
 - Abdominal striae
 - Hyperglycemia/Acanthosis nigricans

Cushing Disease:

- Usually caused by pituitary gland ACTH overproduction
 - can be caused by:
 - Adenoma (ACTH secreting tumor)
 - Pituitary Hyperplasia (she big!)
 - Adrenal Gland Tumor

Performed if you have a positive LDDST

How Do You Dx Cushing's Syndrome?

① Low Dose Dexamethasone Suppression Test

Hypothalamus - CRH ↓

Anterior Pituitary - ACTH ↓

Adrenal glands - Cortisol ↑

- ① Administer 1mg Dexamethasone (normally CRH, ACTH, and cortisol will decrease, but w/ excess cortisol from iatrogenic use of exogenous steroids, cortisol remains elevated or in normal range)

The body looks at 1mg Dexamethasone like it's a JOKE because it has very little to no effect on the cortisol production

② High Dose Dexamethasone Suppression Test

Hypothalamus - CRH ←

Anterior Pituitary - ACTH ↑ ↓

Adrenal glands - Cortisol ↑ ↓

- ① Administer 8mg Dexamethasone
- Pituitary Adenoma
 - ACTH and cortisol ↑↑ at baseline
 - 8mg Dexamethasone administration suppresses ACTH which results in ↓ cortisol.

Hypothalamus - CRH ↓

Anterior Pituitary - ACTH ↓

Adrenal glands - Cortisol ↑ ∅

- ① Administer 8mg Dexamethasone
- Adrenal Adenoma (Endogenous overproduction of cortisol)
 - 8mg Dexamethasone administration has NO EFFECT (∅) on Cortisol d/t adenoma secretion independent of CRH and ACTH

Dexamethasone Suppression Test

• Usually given at night (10 pm) and measured in AM (9a)

Low Dose Test
1mg Dexamethasone

→ Low Cortisol = Normal HPA axis/function
High/Normal Cortisol = Cushing's Syndrome

High Dose Test
8mg Dexamethasone

→ Low Cortisol = Cushing's Disease
High/Normal Cortisol → LOOK at ACTH

ACTH LOW
Adrenal Cushing's

ACTH High
Ectopic ACTH secretion
(i.e. Pituitary Adenoma, ACTH secreting tumor in paraneoplastic syndromes → MEN I)