NURS 821 Metabolic and Endocrine Disorders; Alterations in Reproduction

Lecture 9

Part 2 Disorders of the Adrenal Cortex

Adrenal Glands

Composition:

1. Adrenal Medulla – ANS – inner
2. Adrenal Cortex – outer
   A. Regulated by ACTH (secreted by anterior pituitary gland)
   B. Pituitary is regulated by C.R.F. (hypothalamus)

Secretions

- Hypothalamus secretes C.R.F. to stimulate….
- Anterior pituitary gland to secrete ACTH to stimulate…
- Adrenal Cortex which secretes mineralcorticoids, glucocorticoids, and androgens

Adrenal Cortex Secretions

3 types of corticosteroids:

1. Mineralcorticoids (salt) – promote electrolyte balance
   A. Promote Na + H_20 retention
   B. Promote K excretion

Aldosterone – primary mineralcorticoid

Adrenocortical Secretions (cont'd)

- 2. Glucocorticoids-(sugar) anti-inflammatory agents
  - cortisol
  - cortisone
  - corticosterone

Adrenocortical Secretions (cont'd)

3. Androgens and estrogens (sex) – secreted in small amounts in both sexes.

Adrenocortical Hormones: Actions

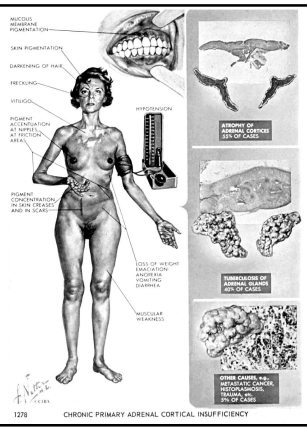
- Promote use of amino acids to repair damaged tissue
- Aid in fluid and electrolyte balance:
  - ↑Na and H_20 reabsorption and K loss
- Promote gluconeogenesis:
  - Increases blood sugar.
- Aid in stress resistance and adjustment
- Supress inflammatory response:
  - ↓Decreases eosinophils and lymphocytes
  - Interferes with tissue granulation

Addison's Disease

- Definition- Chronic adrenal insufficiency, hypocorticism
- Rare endocrine disorder affecting 1/100,000
- All ages, M=F
- Etiology-hypoactive adrenocortical glands
  - Primary-70% autoimmune; 90% destruction
  - Secondary-lack of ACTH (NIDDK, 2000)

Primary Adrenal Insufficiency

- Etiology:
  - Autoimmune
    - May result in a polyendocrine disorder; far ranging effects
  - TB-20%
  - Chronic infections-fungal, metastatic cancer, amyloidosis, adrenalectomy, surgical (NIDDK, 2000)



Addison's Disease

Secondary Adrenocortical Insufficiency

- Definition: ACTH deficiency
- Etiology:
  - secondary to pituitary problem
  - improper glucocorticoid taper
- Usually caused by decreased cortisol, not aldosterone (NIDDK, 2000)

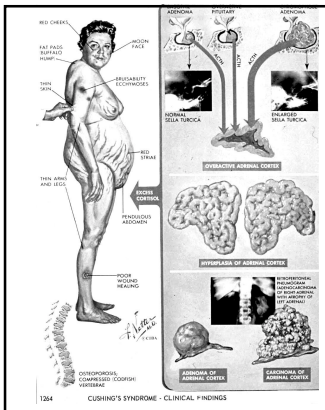
Secondary Adrenal Insufficiency

- Symptoms:
  - Gradual onset unless a stressful event triggers an ***Addisonian Crisis:***

    Sudden penetrating pain in lower back, abdomen, or legs; severe vomiting and diarhea; dehydration; hypotension; loss of consciousness; may be fatal (NIDDK, 2000)

Cushing's Syndrome

- Definition-Hormonal disorder caused by prolonged exposure of body tissues to high levels of cortisol.
- Rare-10-15 million affected annually; adults 20-50
- Etiology-Usually prolonged treatment with glucocorticoids. Also, pituitary adenomas, ectopic ACTH syndrome (Cancers-oat cell, thymomas, thyroid, pancreatic islet cell); adrenal tumors, familial cushing's syndrome; depression; last trimester; alcoholism; malnutrition; panic disorders (NIDDK, 2000).



Cushing's Syndrome

Case Study

- HPI-Jamie, an 8 year old boy of Laotian heritage, is in 3rd grade. He is 5'7" tall and weighs 145 lb. He wears a size 10 ½ men's shoe.
- PMHUnremarkable. At birth, he weighed 12 lbs. And was 24 inches long. At 2 months, he was hospitalized for 1 month due to a ruptured diaphragmatic hernia. He was referred to an endocrinologist at Hopkins due to his rapid linear growth. At age 1, he was diagnosed with gigantism.

Case Study

- DX testing-Pituitary tumor r/o by MRI. GH levels are measured inpatient q 12 h by indwelling IV catheter. GH levels are elevated. Annual testing to monitor.
- Genetic testing-father refused. Mother and 3 siblings carry trait and have identical bands. However, Jamie has an extra chromosome and full manifestations of the disorder.
- TX-none at this time

Case Study

- Family hx-Mother age 39 in good health. Appears large boned and is 6 ft tall. Maternal grandmother, age 66, healthy. Maternal grandfather died at age 30, possibly due to DM. Grandfather had goiter, renal problems, and was 7 ft tall. Maternal aunt alive and wemm. Maternal brother died age 33 drug OD. He was over 7.5 ‘ tall.