

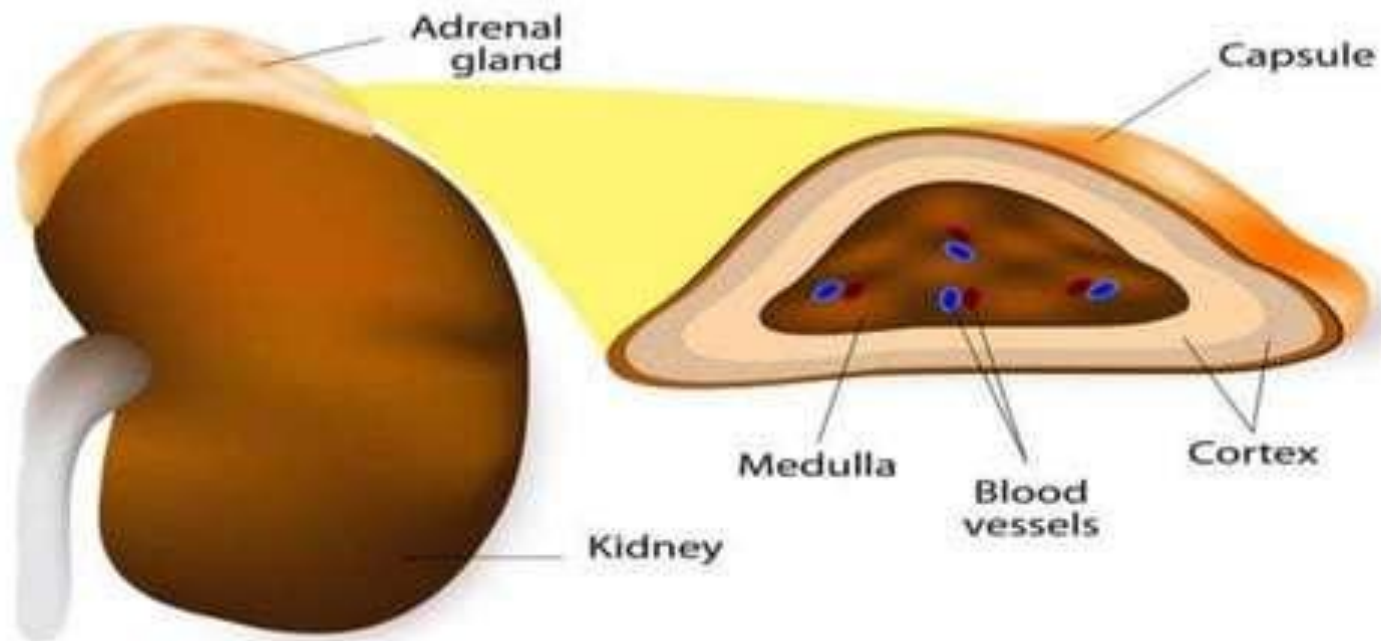
DISORDERS OF ADRENAL GLANDS



BSC(H) NURSING

THE ADRENAL GLAND

ADRENAL GLAND



INTRODUCTION

- The *Adrenal Gland* also known as suprarenal gland are endocrine glands that produce a variety of hormones .
- They are found above the kidneys. Each gland has an outer cortex which produce steroids hormones (i.e. mineralocorticoids, glucocorticoids, and aldosterone) and an inner medulla.
- A number of endocrine diseases involve dysfunctions of the adrenal gland.
- Like either overproduction or insufficient production of cortisol leads to disorder.
- Also a variety of tumors can arise from adrenal tissue and leads to a disease.

DISORDER OF ADRENAL GLANDS

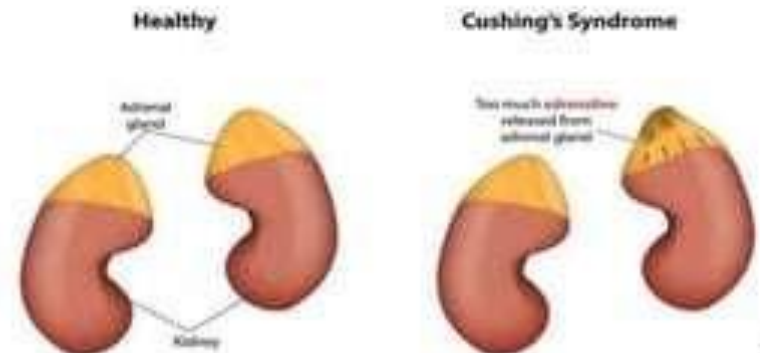
ADDISON'S DISEASE PHEOCHROMOCYTOMA



PI...IONISM



Cushing's Syndrome



ADDISON'S DISEASE

- Addison's disease is a rare disorder which develops when the adrenal glands do not make enough cortisol.
- Addison's is an autoimmune disease. Addison's disease cause damage to the adrenal glands.
- In the long term, this damage can get worse until eventually the adrenal glands aren't working at all.



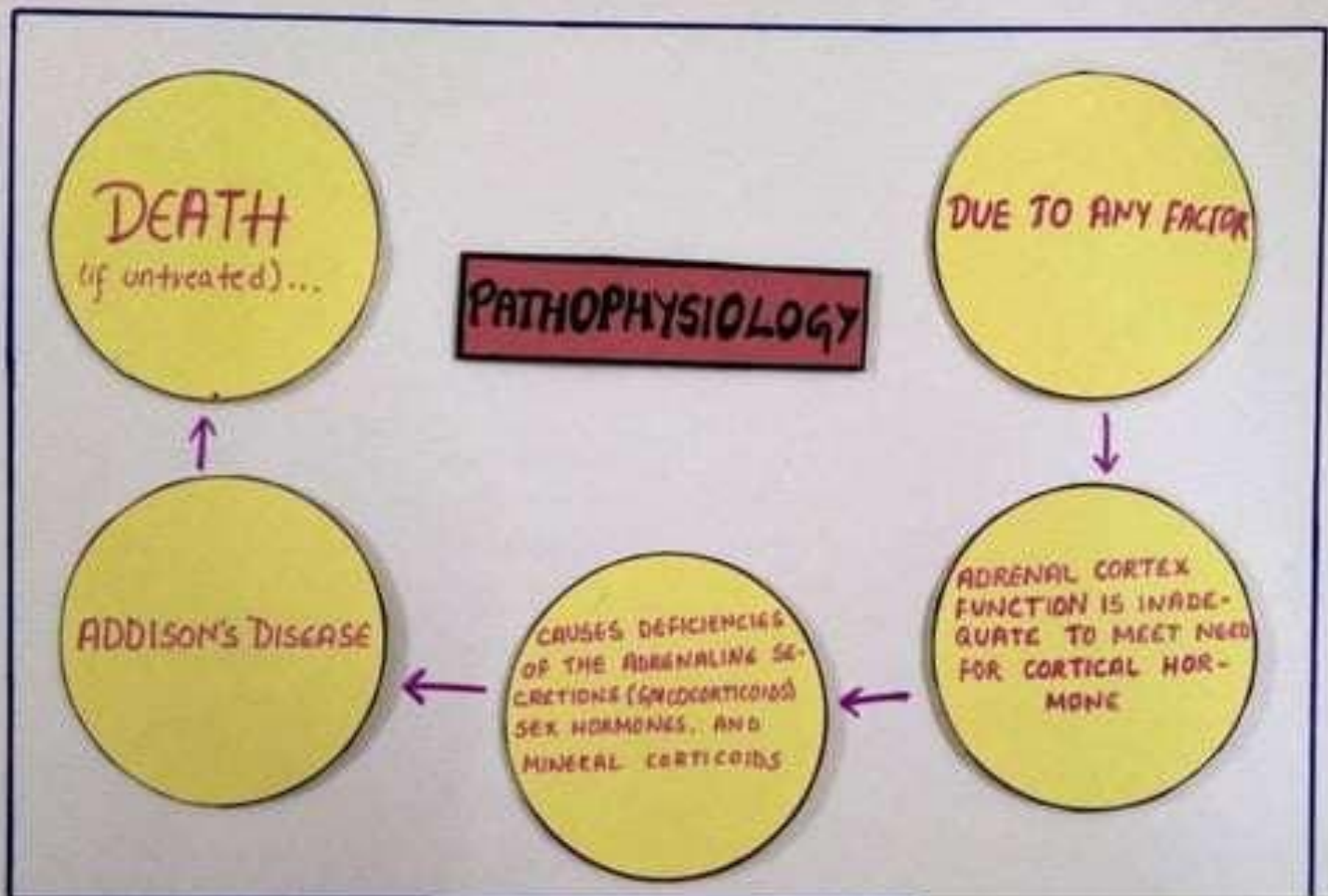
ETIOLOGY

- Primary adrenal insufficiency is caused by hypo function of the adrenal glands
- Auto immune response
- Inadequate secretion of the adrenal hormone
- Infection of the adrenal hormone
- Tuberculosis, AIDS, metastatic cancer etc.

TUBERCULOSIS



PATHOPHYSIOLOGY



RISK FACTORS

- A history of other endocrine disorders
- Taking glucocorticoids for more than 3 weeks with sudden cessation
- Taking glucocorticoids more than once every other day
- Adrenalectomy
- Tuberculosis

TUBERCULOSIS



CLINICAL MANIFESTATIONS

IRRITABILITY



FATIGUE



ABDOMINAL PAIN



VOMITING



ANOREXIA



ASSESSMENT & DIAGNOSTIC FINDINGS

- **Blood test** : This test measure your blood levels of sodium, potassium, cortisol and adrenocorticotrophic hormone (ACTH), which stimulates the adrenal cortex to produce its hormones.
- **ACTH stimulation test** : This test measures the level of cortisol in your blood before and after an injection of synthetic ACTH.
- Other laboratory finding include



COMPLICATIONS

- ❑ Hypoglycemia
- ❑ Low levels of cortisol
- ❑ Complications from adrenal crisis:
 - Cardiac arrest
 - Stroke
 - Hypoxia
 - Hypovolemic shock



MEDICAL MANAGEMENT

- Immediate treatment includes restoring blood circulation, administering fluids and corticosteroids, monitoring vital signs and placing pt. in a recumbent position with legs elevated.
- Hydrocortisone is administered by IV, following by 5% dextrose in normal saline.
- Oral medications for the disease are:
 - Hydrocortisone pills to replace cortisol.
 - If you are also lacking aldosterone, you may need fludrocortisone acetate.



NURSING MANAGEMENT

NURSING DIAGNOSIS -1

Risk for Deficient Fluid Volume related to Increase in sodium and water excretion with potassium retention

➤ NURSING INTERVENTIONS

- Assess skin turgor and mucous membranes for signs of dehydration.
- Assess vital signs, especially noting BP and HR for orthostatic changes.
- Assess color, concentration, and amount of urine.
- Assess trends in weight.
- Encourage oral fluids as the patient tolerates
- Instruct the patient to ingest salt additives in conditions of excess heat or humidity

2. Risk for imbalance nutrition related to Decreased gastrointestinal enzymes, causing loss of appetite and decreased oral intake tolerance

➤ **NURSING INTERVENTIONS**

- Assess appetite and for the presence of nausea, vomiting, or diarrhea.
- Monitor trends in weight.
- Assess foods that patient can tolerate
- Monitor serum glucose levels.
- Ask the dietician to provide high-protein, low-carbohydrate, high-sodium diet.
- Encourage rest periods after eating

3. Risk for Decreased Cardiac Output related to Any situations requiring increased corticosteroids .

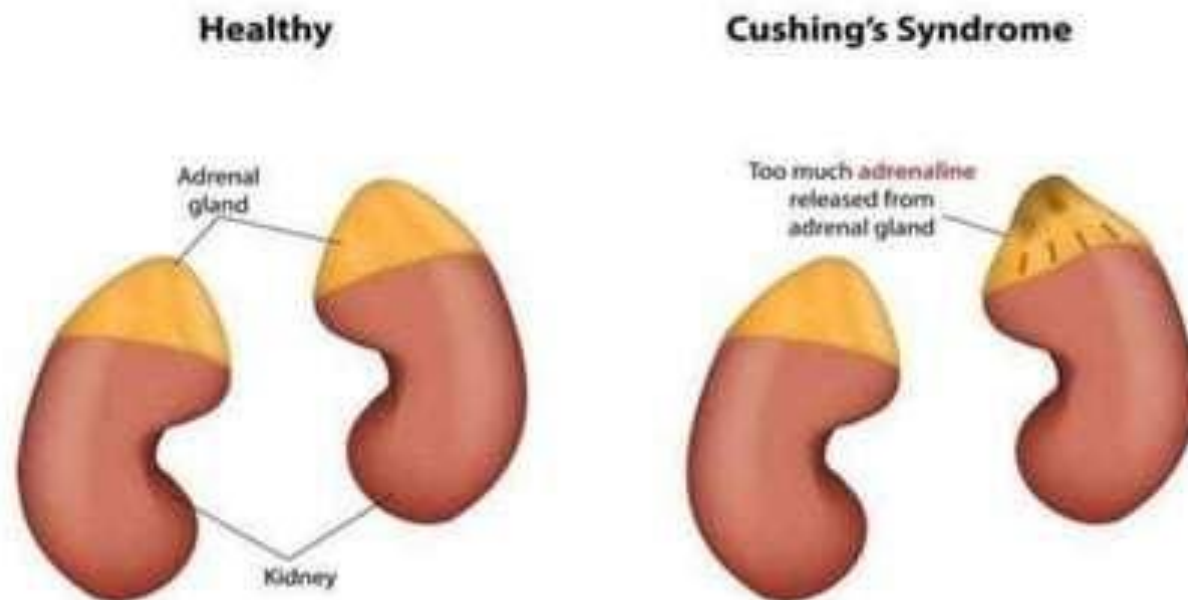
➤ **NURSING INTERVENTIONS**

- Assess skin warmth and peripheral pulses
- Assess level of consciousness.
- Monitor vital signs with frequent monitoring of BP.
- Monitor urine output.
- Minimize stressful situations and promote a quiet environment.

CUSHING SYNDROME

- Cushing's syndrome is a rare disorder that occurs when your body makes too much of the hormone cortisol over a long period of time. Cushing syndrome, may be caused by the use of oral corticosteroid medication

Cushing's Syndrome



ETIOLOGY

- Extensive use of cortisone medication
- A benign tumor of adrenal gland
- Excessive secretion of adrenal androgens
- A benign tumor of the lungs or other organs
- Administration of ACTH or corticosteroids



PATHOPHYSIOLOGY

DUE TO ETIOLOGICAL FACTOR



NORMAL FEEDBACK MECHANISMS THAT CONTROL ADRENCORTICAL FUNCTION ARE INEFFECTIVE



RESULTING IN EXTRA SECRETION OF ADRENAL CORTICAL HORMONES



INADEQUATE AMOUNT OF ADRENAL CORTICAL HORMONE'S IN SECRETION



HYPERCORTISOLISM

CLINICAL MANIFESTATIONS

- Weight gain and fatty tissue deposits, particularly around the midsection and upper back, in the face (moon face), and between the shoulders (buffalo hump)
- Pink or purple stretch marks on the skin of the abdomen, thighs, breasts and arms
- Slow healing of cuts
- Acne
- Excess sweating
- Infertility
- Muscle weakness



ASSESSMENT & DIAGNOSTIC FINDINGS

- **Serum cortisol test:** Serum cortisol levels are usually higher in early morning (6-8AM) and lower in the evening (4-6PM) In Cushing syndrome this variation is lost.
- **Urinary cortisol test:** This tests measure hormone levels and show whether your body is producing excessive cortisol(for Cushing syndrome it is generally three times the upper limit). For the urine test, Pt. is asked to collect urine over a 24-hour period.
- **Electrolyte level:** A patient with Cushing's syndrome include an increase in serum sodium and a decrease in potassium levels.

COMPLICATIONS

- Heart attack and stroke
- Blood clots in the legs and lungs
- Infections
- Bone loss and fractures
- High blood pressure
- Unhealthy cholesterol levels
- Depression or other mood changes
- Memory loss or trouble concentrating
- Insulin resistance and prediabetes
- Type 2 diabetes



MEDICAL MANAGEMENT

- ❑ Most patients are rendered hypoadrenal for months to years after the procedure.
- ❑ During this period, they require glucocorticoid replacement therapy.
- ❑ Radiation therapy may also be used to treat pituitary or adrenal tumors.
- ❑ Medications can be used to control cortisol production when surgery and radiation don't work.
 - Ketoconazole, Mitotane (Lysodren) and Metyrapone (Metopirone): to control excessive production of cortisol at the adrenal gland.
 - Pasireotide(Signifor): decreasing ACTH production from a pituitary tumor

NURSING MANAGEMENT

NURSING DIAGNOSIS

1. Risk For Excess Fluid Volume related to Retention of water and sodium caused by an excess of cortisol and mineralocorticoid levels.

➤ NURSING INTERVENTIONS

- Assess for signs of circulatory overload:
 - ✓ Cyanosis
 - ✓ Dyspnea
 - ✓ Edema
 - ✓ Distended neck veins.
 - ✓ Shortness of breath.
- Assess for cardiac dysrhythmias
- Monitor vital signs, especially BP and HR.
- Instruct the client to elevate feet when sitting down.
- Instruct the client to reduce fluid intake as Indic

2. Risk For Injury related To Generalized fatigue and weakness and Poor wound healing.

➤ **NURSING INTERVENTIONS**

- Assess the skin frequently to check for reddened areas, skin breakdown, tearing, or excoriation.
- Assess the skin for signs of bruising.
- Ask the client about problems with poor wound healing.
- Instruct the client about keeping the skin clean and moisturized.
- Encourage the client to eat a high-protein diet

3. Risk For Infection related to Altered protein metabolism or High serum cortisol level.

➤ **NURSING INTERVENTIONS**

- Assess frequently for subtle signs of infections.
- Avoid unnecessary exposure to people with infections.
- Stress the importance of adequate rest.
- Use strict medical and surgical asepsis when providing care.
- Emphasized the importance of good nutrition.
- Stress proper hand washing techniques

PHEOCHROMOCYTOMA

- Pheochromocytomas are a type of tumor of the adrenal glands that can release high levels of epinephrine and nor epinephrine. Pheochromocytomas may occur in persons of any age, (mostly in people with hypertension). Pheochromocytomas are, fortunately, quite rare, and most of them are benign.

PHEOCHROMOCYTOMA

A Tumor in Adrenal Medulla



CLINICAL MANIFESTATIONS

- Hypertension
- Headache
- Heavy sweating
- Rapid heart beat
- Tremors
- Shortness of breath
- Panic attacks
- Weight loss
- Pallor



ASSESSMENT & DIAGNOSTIC FINDINGS

- **Lab tests:** The following tests measure levels of adrenaline, nor adrenaline or byproducts of those hormones in your body:
 - ✓ 24-hour urine test.
 - ✓ Blood test.
- **Genetic testing :** Your doctor might recommend genetic tests to determine whether a pheochromocytoma is related to an inherited disorder.

COMPLICATIONS

- High blood pressure
- Heart attack
- Heart failure
- Stroke
- Kidney failure
- Cognitive decline
- Dementia
- Visual impairment



MEDICAL MANAGEMENT

- The primary treatment for a pheochromocytoma is surgery to remove the tumour.
- Before surgery, doctor will likely prescribe specific blood pressure medications that block the actions of the high-adrenaline hormones to lower the risk of developing dangerously high blood pressure during surgery.
- ✓ Medications (chemotherapy) designed to kill tumor cells
- ✓ Radiotherapy: utilizing radio waves to destroy the tumors
- ✓ Medications to control the signs and symptoms of the disease:

NURSING MANAGEMENT

NURSING DIAGNOSIS

1. Risk for Decreased Cardiac Output related to high blood pressure.

➤ NURSING INTERVENTIONS

- Review clients at risk as noted in Related Factors as well as individuals with conditions that stress the heart.
- Monitor and record BP, Use correct cuff size and accurate technique.
- Observe skin color, moisture, temperature, and capillary refill time.
- Note dependent and general edema.

2. Activity Intolerance related to Generalized weakness

➤ NURSING INTERVENTIONS

- Note presence of factors contributing to fatigue (age, frail, acute or chronic illness, heart failure etc)
- Evaluate client's actual and perceived limitations or degree of deficit in light of usual status.
- Assess the patient's response to activity, noting pulse rate
- Assess emotional and psychological factors affecting the current situation.

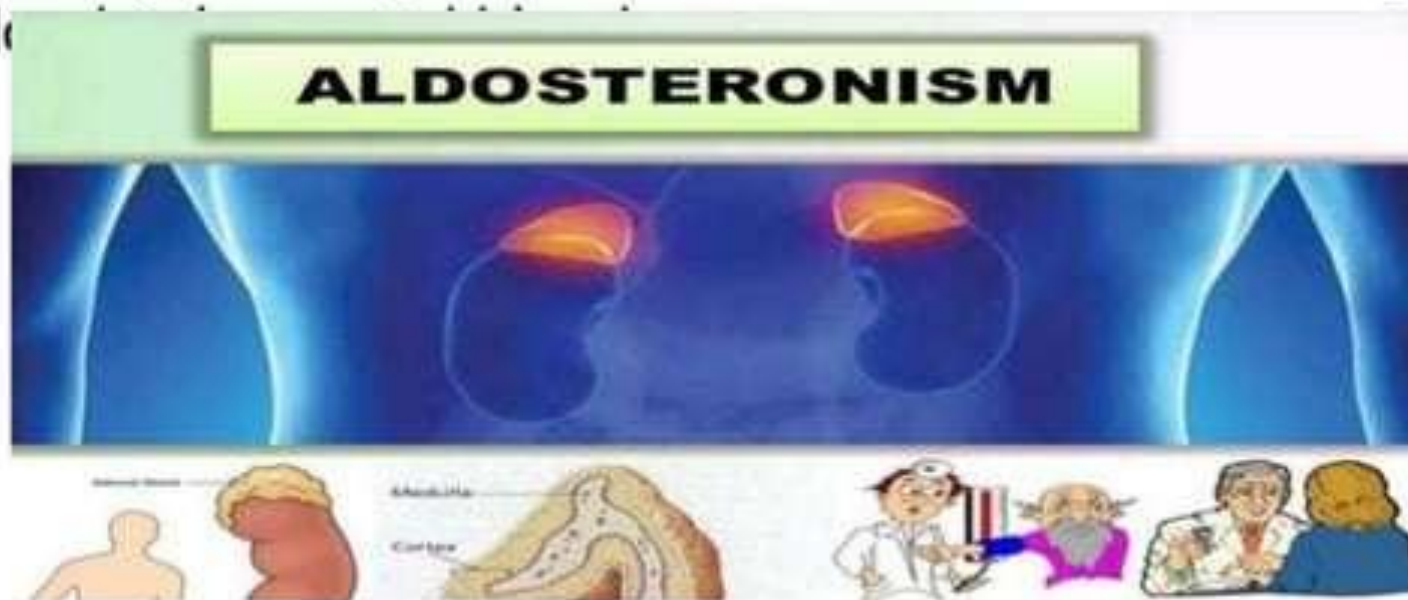
3. Imbalanced Nutrition: More Than Body Requirements related to Excessive intake in relation to metabolic need or Sedentary activity level

➤ **NURSING INTERVENTIONS**

- Assess risk or presence of conditions associated with obesity
- Discuss necessity for decreased caloric intake and limited intake of fats, salt, and sugar as indicated.
- Review usual daily caloric intake and dietary choices.
- Refer to dietitian as indicated.

PRIMARY ALDOSTERONISM

- Primary aldosteronism is a hormonal disorder that leads to high blood pressure. It occurs when your adrenal glands produce too much of a hormone called aldosterone. too much of this hormone can cause you to lose potassium and retain sodium. That imbalance can cause your body to hold too much water, increasing your blood volume and blood pressure.



CLINICAL MANIFESTATIONS

- Sometimes, primary aldosteronism causes low potassium levels. If this happens, you may have:
- Muscle cramps
- Weakness
- Fatigue
- Headache
- Excessive thirst
- A frequent need to urinate
- high blood pressure



ASSESSMENT & DIAGNOSTIC FINDINGS

- **Renin test:** a test to measure levels of aldosterone and renin in your blood will be done. Renin is an enzyme released by your kidneys that helps control blood pressure. If your renin level is very low and your aldosterone level is high, you may have primary aldosteronism.
- **Salt-loading test.** You may eat a high-sodium diet for a few days before measuring your aldosterone levels. You may also be given fludrocortisone (a drug that mimics the action of aldosterone) in addition to the high-sodium diet before the test

COMPLICATIONS

- **High blood pressure:** Persistently elevated blood pressure can lead to problems with your heart and kidneys, including:
 - ✓ Heart attack, heart failure and other heart problems
 - ✓ Stroke
 - ✓ Kidney disease or kidney failure
- **Hypokalemia:** Primary aldosteronism may cause low potassium levels. Very low levels of potassium can lead to:
 - ✓ Weakness
 - ✓ Irregular heart rhythm
 - ✓ Muscle cramps
 - ✓ Excess thirst or urination



MEDICAL MANAGEMENT

- A combination of medications and can effectively treat primary aldosteronism caused by over activity of both adrenal glands.
- Mineralocorticoid receptor antagonists block the action of aldosterone in your body.
- spironolactone (Aldactone) This medication helps correct high blood pressure and low potassium.
- Some high blood pressure medicine may also be prescribed

NURSING MANAGEMENT

NURSING DIAGNOSIS

1. Insufficient body fluid related to decreased intake of water

➤ NURSING INTERVENTIONS

- Urge the patient to drink prescribed amount of fluid.
- Aid the patient if he or she is unable to eat without assistance, and encourage the family or SO to assist with feedings, as necessary.
- Emphasize importance of oral hygiene.
- If patient can tolerate oral fluids, give what oral fluids patient prefers.

2. Fatigue related to low potassium level

➤ NURSING INTERVENTIONS

- Restrict environmental stimuli, especially during planned times for rest and sleep.
- Aid the patient with developing a schedule for daily activity and rest. Emphasize the importance of frequent rest periods.
- Promote sufficient nutritional intake.
- Offer diversional activities that are soothing.
- Encourage an exercise conditioning program as appropriate

RESEARCH

Researchers at NIH's *Eunice Kennedy*

Shriver National Institute of Child Health and Human Development (NICHD), in collaboration with researchers at other institutions in the United States, France and Canada, scanned tumor and cell tissue from 146 children with pituitary tumors evaluated for Cushing syndrome at the NIH Clinical Center.

Researchers also scanned the genes of tumors from some of the children. Investigators in France scanned the genes of an additional 35 adult patients with Cushing syndrome and

- The research team found that four of the patients have mutant forms of *CABLES1* that do not respond to cortisol. This is significant because, when functioning normally, the *CABLES1* protein, expressed by the *CABLES1* gene, slows the division and growth of pituitary cells that produce the hormone adrenocorticotropin (ACTH). In turn, ACTH stimulates the adrenal gland to produce cortisol, which then acts on the pituitary gland to halt the growth of ACTH-producing cells, effectively suppressing any tumor development. Because cortisol does not affect the four mutant forms of *CABLES1* discovered by the researchers, these genes leave production of ACTH-releasing cells unchecked.

➤ The study authors noted that the *CABLES1* mutants were found in a small proportion of patients and that other genes have been implicated in pituitary tumor formation. They added that more studies are needed to fully understand how *CABLES1* suppresses tumor formation in the pituitary gland.

CONCLUSION

- Today we all have discussed together about the topic which is **DISORDERS OF ADRENAL GLANDS**. In this we all get to know about the types of adrenal gland disorder, their sign and symptoms, their assessment and diagnostic findings, their medical and nursing management.

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Thank You!