What is central diabetes insipidus (DI)

Central Diabetes Insipidus (DI) is a condition that causes frequent urination. To control the amount and concentration of urine production, hypothalamus (a part of brain) makes an antidiuretic hormone called vasopressin. Vasopressin is stored and released by the pituitary gland. In Central DI, the body does not make enough antidiuretic hormone and this affects the water regulation mechanism in the body.

Damage of the hypothalamus or pituitary gland is the main cause of central DI, which can be classified as primary (idiopathic) or secondary. Secondary causes may include any of the followings: head injury or brain surgery, medical conditions such as brain cancer or sarcoidosis, infections such as meningitis or encephalitis.

What are the common symptoms of central diabetes insipidus?

- Feeling very thirsty and drinking more liquid than usual
- Needing to urinate often during both daytime and nighttime, which may affect sleep
- Dry skin
- Dehydration

How is central diabetes insipidus treated?

Desmopressin (DDAVP) is a common drug used for treatment. Desmopressin is structurally similar to vasopressin which can help decrease urination.

It is crucial that patient takes the medication regularly according to the dosage instructions. Although medication will improve the symptoms, continue taking the drug is important. Patient should discuss with the doctor before any medication titration or discontinuation.

How is DDAVP administered?

Desmopressin (DDAVP) is available in different dosage forms. The Minirin® Melt oral lyophilisate is administered by placing it under the tongue where the tablet would dissolve and then absorbed. It should be administered at the same time each day or as directed by the doctor. For patient with intact thirst sensation and free accessibility to fluid, they should drink according to their thirst sensation. For patient without intact thirst sensation and/or without free accessibility to fluid, they should drink according to doctor's advice.

What will happen if central diabetes insipidus is not treated?

Symptoms will get worse. Patient may become dehydrated and experience electrolytes imbalance which can cause severe complications.

What patients need to pay attention to when taking DDAVP?

- Use the medication as directed. Do not stop taking the medication or change the dosage or frequency unless instructed by doctor.
- Tell health professionals if you are pregnant, planning to become pregnant or breastfeeding.

What are the lifestyle modifications that patients can do?

- Monitor fluid intake and output regularly.
- Follow intake of salt and fluids as instructed by the doctor.
- Measure body weight every day and monitor for any changes.

What are adrenal glands

Adrenal glands are endocrine organs that sit on top of kidneys and produce hormones that help regulate many body functions including blood pressure, blood glucose, and electrolytes.

What is adrenal insufficiency?

Adrenal insufficiency is a state when the adrenal glands are not functioning well, leading to insufficient production of adrenal hormones, causing symptoms.

What are some common symptoms of adrenal insufficiency?

- Feeling dizzy when sitting up or standing up
- Feeling tired
- Feeling weak
- Nausea and vomiting
- Weight loss

Can symptoms of adrenal insufficiency become severe?

Yes. Symptoms of adrenal insufficiency can become severe and even life-threatening when a patient's body is under stress, eg: infection or trauma. These symptoms include: severe nausea and vomiting, stomach pain, confusion, shock, and losing consciousness. These constitute the "adrenal crisis".

How is adrenal insufficiency diagnosed?

This condition is diagnosed by a series of clinical and biochemical +/- radiological assessments.

How is adrenal insufficiency treated?

Treatment is by replacing the hormones that are missing. A patient with adrenal insufficiency needs to take these hormones every day until the adrenal glands functions recover. Hydrocortisone is the most commonly prescribed hormone to treat adrenal insufficiency. Usual dosage is 10mg twice a day taken orally.

Can patients self-stop hydrocortisone?

No. It is of vital importance that patients on hydrocortisone do not stop the medication on their own unless being instructed by their doctors to do so. Stopping hydrocortisone suddenly might lead to severe symptoms or even adrenal crisis.

Can patients self-titrate the dose of hydrocortisone?

- Yes and No
- Yes, in cases of minor illness (cold or flu), minor procedures (dental), and minor surgeries. The adrenal glands normally increase cortisol output when the body is stressed by illness, procedures, and surgeries. Patients with adrenal insufficiencies do not have this auto-regulation ability. Therefore, they need to adjust the dose of hydrocortisone by doubling it to 20mg twice per day orally until they have recovered from these minor conditions. If patients suffer from vomiting and could not tolerate oral medications, they should seek medical advice.
- No, in case of major medical illness, procedures, and surgeries. Doctors will decide on stress coverage dosage needed according to specific hospital protocol.

What if I miss a dose

Take the missed dose as soon as you remember. Skip the missed dose if it is almost time for your next scheduled dose.

How to store

- Store in a cool and dry place away from direct heat and light.
- Keep out of reach of children.
- Discard all medications that have expired or are no longer required.
- Do not share the medications with other people.

For any queries, please seek advice from your doctor, pharmacist or other healthcare professionals.

S/N: 056Ev1 (10/2023)

Medications for Endocrine diseases

藥劑職系及服務統籌委員會
COC-Grade (Pharmaceutical Services)

醫院管理局
HOSPITAL AUTHORITY

What is an endocrine system

An endocrine system is a circulatory network within the human body that is responsible for producing hormones and regulating their levels. It maintains the normal functioning of various organs in the body. The major endocrine system includes the hypothalamus, pituitary gland, thyroid gland, parathyroid glands, adrenal glands, pancreas, ovaries, and testes.

What is the thyroid gland

The thyroid gland is a butterfly-shaped endocrine gland that is normally located in the lower front of the neck:

- The function of the thyroid gland is to make thyroid hormones which are secreted into the blood stream and then carried to every tissue in the body.
- Thyroid hormone helps the body to use energy, stay warm and help the brain, heart, muscles and other organs to function properly.

What is thyroid disorder?

When the thyroid gland produces too much thyroid hormone, the condition is known as **hyperthyroidism**. Conversely, when the thyroid gland produces an insufficient amount of thyroid hormone, the condition is known as **hypothyroidism**.

Treatment of Hyperthyroidism

Treatment of hyperthyroidism depends on the patient's age, physical status, and specific cause and severity of patient's condition. Treatment options include: anti-thyroid medicine, radioactive iodine treatment, surgical removal.

Treatment of Hypothyroidism

- Hypothyroidism is treated with Levothyroxine, a synthetic hormone, which is biologically equivalent to your own thyroid hormone, Thyroxine (T4). The goal of thyroid hormone replacement is to closely replicate normal thyroid functioning.
- The only safety concern about taking thyroid hormone is taking too much or too little.
- Your thyroid hormone will be monitored by your doctor to keep your levels within normal range.

How is the dose chosen?

- The initial dose of thyroid hormone is selected based on your weight, age and other medical conditions.
- Your doctor will make sure the thyroid hormone dose is correct by performing periodic evaluation and checking of blood levels.

How to take thyroid hormone?

- It is taken once daily and this results in stable levels of thyroid hormone in the blood stream.
- The best time to take thyroid hormone is at bedtime (3 - 4 hours after the last meal). Alternatively, you may choose to take your thyroid hormone in the morning on an empty stomach at least 30 - 60 minutes before breakfast. This is because food or other medications can affect the absorption of thyroid hormone.
- The most important thing is to be consistent, and take your thyroid hormone at the same time every day.
- If you are taking other medications, you should discuss the timing of your thyroid hormone dose with your doctor or pharmacist.

Does thyroid hormone interact with other medications?

- Separate the administration of thyroid hormone with iron, calcium, antacids (like Aluminum or Magnesium hydroxide, Simethicone) and some cholesterol lowering medications (like Cholestyramine) for at least 4 hours.
- Medications that may cause patients to need a different dose include birth control pills, oestrogen, testosterone, heart medications like Amiodarone, some anti-seizure medications (like Phenytoin and Carbamazepine) and some medications for mood such as Lithium.
- Biotin supplements can interfere with the blood tests used to measure thyroid levels, so it is recommended to stop taking biotin-containing supplements for 2-3 days prior to thyroid blood tests.

Precautions related to drug administration

- If your thyroid gland has been surgically removed totally or you have autoimmune thyroid disease, hypothyroidism is usually permanent and lifelong thyroxine replacement is needed.
- It is important that your thyroid hormone and TSH levels are checked at least annually even if you are feeling well, so that your dose of thyroid hormone can be adjusted if needed.
- Do not stop your thyroid hormone without discussing with your doctor.
- Inappropriate discontinuation of thyroid replacement therapy may lead to symptoms of hypothyroidism.

Should I take thyroid hormone while I am pregnant?

- Since thyroid hormone is a hormone normally present in the body, it is safe to take it while pregnant.
- It is especially important for pregnant women or women who are planning a pregnancy to have normal thyroid function for the health of the baby.
- If you are taking regular thyroid hormone, you will likely need an increased dose of thyroid hormone during pregnancy. Therefore, you should contact your doctor immediately as soon as you know you are pregnant.

Medications for Endocrine diseases

Classes of Medications	Common side effects	Precautions
Medication for Hypothyroidism		
Levothyroxine	Side effects of thyroid hormone are usually resulted from the over- or under-treatment of the thyroid disease.	• If your thyroid hormone level is too high, there is an increased risk of developing symptoms of hyperthyroidism which include palpitations, tremors, excessive sweating, heat intolerance, excessive weight loss, diarrhea, anxiety, feeling nervous and insomnia. On the contrary, if your thyroid hormone level is too low, there is an increased risk of developing symptoms of hypothyroidism which include fatigue, feeling cold, poor memory, slowness, constipation, hair loss, generalized puffiness with fluid retention and in more severe cases, coma. If you develop any of these symptoms, seek medical help immediately.
Medication for Hyperthyroidism		
Thionamides Carbimazole, Methimazole, Propylthiouracil	Nausea, vomiting, gastric discomfort, headache, arthralgia, rashes, and pruritus	• Agranulocytosis is a rare but serious side effect of thionamides. If you experience symptoms such as fever, sore throat, or headache, seek immediate medical attention. • Severe liver injury and acute liver failure have been reported in patients treated with propylthiouracil. If you notice any symptoms of hepatic dysfunction like (loss of appetite, dark urine and jaundice, right upper quadrant pain etc), consult your doctor immediately. • If you are planning to get pregnant or you have become pregnant, please contact your doctor because a change in the drug therapy may be required.
Medication for adrenal insufficiency		
Hydrocortisone	Increased blood pressure, impaired glucose tolerance, increased appetite	• Take with meals.
Fludrocortisone	Increased blood pressure, fluid retention	• Store in a refrigerator (2 - 8 C), do not freeze.
Medication for central diabetes insipidus		
Desmopressin (DDAVP)	Stomach pain, headache, nausea, dizziness	• Loss of fluid and electrolyte balance if not follow dosage or timing as advised. • Consult the health professionals immediately if you have these symptoms: nausea, vomiting, edema, severe headache, muscle weakness / cramps, unusual fatigue and seizure.