

Diabetes insipidus

Diabetes insipidus is characterised by extreme thirst and the passing of vast amounts of urine. It is caused by insufficient vasopressin, a hormone produced by the brain that instructs the kidneys to retain water. Without enough vasopressin, too much water is lost from the body in urine, which prompts the affected person to drink large amounts of fluids in an attempt to maintain their fluid levels. In severe cases, a person may pass up to 30 litres of urine per day. Without treatment, diabetes insipidus can cause dehydration and, eventually, coma due to concentration of salts in the blood, particularly sodium.

The name of this condition is a little misleading, since diabetes insipidus has nothing to do with diabetes mellitus (a condition characterised by high blood sugar levels), apart from the symptoms of thirst and passing large volumes of urine. The word diabetes means 'to go through' - describing the excessive urination. Insipidus means the urine is tasteless, whereas mellitus suggests it is sweet from its sugar content. This terminology dates back to a time when physicians literally dipped a finger in the patient's urine and tested its taste. Not a diagnostic method much in use today!

Symptoms

The symptoms of diabetes insipidus include:

- Extreme thirst that can't be quenched (polydipsia)
- Excessive amounts of urine (polyuria)
- Colourless urine instead of pale yellow
- Waking frequently through the night to urinate
- Dry skin
- Constipation
- Weak muscles
- Bedwetting.

Too much water is lost in the urine

The kidneys are organs of excretion. They filter the blood to remove wastes (such as urea) and regulate the amount of salts and water in the bloodstream. The hormone vasopressin is made by a structure in the brain called the hypothalamus. Vasopressin controls the amount of water excreted by the kidneys. Diabetes insipidus can be caused by two flaws in this process: the hypothalamus isn't making enough vasopressin or the kidneys aren't responding to the hormone. Either way, the result is the loss of too much water in the urine, leading to the characteristic symptom of excessive thirst.

There are various forms of diabetes insipidus

The forms of diabetes insipidus are categorised by cause and include:

- **Neurogenic** - the brain doesn't produce enough of the hormone vasopressin. Some of the events that could cause this form of diabetes insipidus include head injury, infection (such as meningitis), brain tumour, ruptured aneurysm or brain surgery. In about half of cases, the cause remains unknown (idiopathic neurogenic diabetes insipidus).
- **Nephrogenic** - the kidneys aren't sensitive to vasopressin and fail to respond. This comparatively rare form of diabetes insipidus is caused by an inherited disorder that affects the tubules, the tiny structures inside the kidneys that absorb water. Men are more prone to this condition than women. In adults nephrogenic diabetes insipidus can be caused by treatment with lithium and by hypercalcemia.

Possible complications

Without medical treatment, the possible complications of diabetes insipidus include:

- Chronic dehydration
- Low body temperature
- Accelerated heart rate
- Weight loss
- Fatigue
- Frequent headaches
- Low blood pressure (hypotension)
- Kidney damage
- Brain damage.

Diagnosis methods

Diabetes insipidus is diagnosed using a number of tests including:

- Medical history
- Physical examination
- Urine analysis
- Blood tests - to measure electrolyte levels
- Water deprivation test (to see how much urine is passed)
- Magnetic resonance imaging (MRI) scan of the brain
- Computed tomography (CT) scans.

Treatment options

Treatment for diabetes insipidus (DI) depends on the cause. For DI that is associated with decreased vasopressin production, replacement of vasopressin is required. This is usually given by sniffing a small amount of vasopressin that can be absorbed through the lining of the nose. For DI that is associated with reduced or absent response to vasopressin, adequate replacement of fluids is necessary.

Options include:

- Drink plenty of fluids.
- Switch to a low salt diet.
- Medications like hydrochlorothiazide and non-steroidal anti-inflammatory drugs may help.

Some forms of DI, such as those that occur following head injury or neurosurgery or during pregnancy, resolve with time.

Where to get help

- Your doctor
- Australian Pituitary Foundation Tel. 1300 331 807 email: support@pituitary.asn.au

Things to remember

- Diabetes insipidus is characterised by extreme thirst and the passing of large amounts of urine.
- It is caused by the lack of sufficient vasopressin, a hormone produced by the brain that instructs the kidneys to retain water.
- Treatment options include vasopressin replacement.

This page has been produced in consultation with, and approved by:

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