



Polyuria and Its Clinical Significance in Everyday Practice

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DESCRIPTION

Polyuria refers to the production of abnormally large volumes of urine, typically defined in adults as output exceeding three liters per day. While frequent urination may sometimes be confused with this condition, polyuria specifically involves an increase in total urine volume rather than simply more trips to the bathroom. It can affect individuals of all ages and often signals an underlying medical issue that requires evaluation and management. Recognizing the causes and consequences of excessive urine production is essential for accurate diagnosis and effective treatment.

The body maintains fluid balance through a coordinated interaction between the kidneys, hormones, and circulatory system. The kidneys filter blood, removing waste products and adjusting water and electrolyte levels according to the body's needs. Antidiuretic hormone, produced by the pituitary gland, regulates the amount of water reabsorbed in the kidneys. When this balance is disrupted, urine output may rise significantly. Polyuria may develop gradually or appear suddenly, depending on the underlying cause.

One of the most common causes of polyuria is uncontrolled diabetes mellitus. Elevated blood glucose levels lead to increased filtration of glucose by the kidneys. When the concentration exceeds the kidney's capacity to reabsorb it, glucose spills into the urine. This presence of glucose draws water along with it through an osmotic effect, resulting in increased urine volume. Individuals with this condition often experience intense thirst, known as polydipsia, alongside polyuria. Early identification of diabetes is vital to prevent further complications.

Another important cause is diabetes insipidus, a condition unrelated to blood sugar levels. In this disorder, the body either does not produce sufficient antidiuretic hormone or the kidneys do not respond appropriately to it. As a result, large amounts of dilute urine are produced. Central diabetes insipidus arises from reduced hormone production, often due to injury, infection, or abnormalities affecting the pituitary gland. Nephrogenic diabetes insipidus occurs when the kidneys fail to respond to the

hormone. Both forms lead to excessive urination and persistent thirst.

Certain medications can also contribute to increased urine output. Diuretics, commonly prescribed for high blood pressure or heart conditions, intentionally promote fluid excretion to reduce fluid overload. While their effect is expected, improper dosing or sensitivity may result in excessive fluid loss. Other drugs, including lithium and some antiviral medications, can interfere with kidney function and lead to polyuria.

Excessive fluid intake, sometimes referred to as primary polydipsia, represents another potential cause. Individuals may consume large amounts of water due to habit, psychiatric conditions, or a misinterpretation of health advice. When fluid intake surpasses the kidneys' ability to concentrate urine, urine output rises accordingly. In such cases, addressing behavioral or psychological factors may be necessary to restore normal balance.

Electrolyte disturbances can also trigger polyuria. Elevated calcium levels, for example, may impair the kidney's concentrating ability. Low potassium levels can have a similar effect. These imbalances may result from endocrine disorders, kidney disease, or medication use. Identifying and correcting the underlying abnormality is essential to resolving symptoms.

Symptoms associated with polyuria extend beyond frequent urination. Persistent thirst, dry mouth, fatigue, and disrupted sleep are common. Nighttime urination, or nocturia, can significantly affect quality of life by interrupting rest. In children, excessive urine output may present as bedwetting or increased diaper saturation. Severe cases can lead to dehydration if fluid intake does not match losses. Signs of dehydration include dizziness, low blood pressure, and reduced skin elasticity.

CONCLUSION

Chronic untreated polyuria can lead to significant health concerns. Persistent dehydration may strain the cardiovascular system and kidneys. Electrolyte imbalances can affect heart rhythm and muscle function. In individuals with diabetes, ongoing high blood sugar levels increase the risk of long-term

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complications such as neuropathy, kidney disease, and vision problems. Early detection and consistent management reduce these risks. Management of polyuria depends on its underlying cause. In diabetes mellitus, controlling blood glucose through medication, diet, and lifestyle changes can significantly reduce

urine output. For diabetes insipidus, synthetic forms of antidiuretic hormone may be prescribed in central cases, while nephrogenic forms require alternative strategies such as dietary adjustments and specific medications to improve kidney response.