Syndrome Of Inappropriate Antidiuretic Hormone (SIADH)

Syndrome of inappropriate antidiuretic hormone (SIADH) occurs when antidiuretic hormone (ADH) which normally regulates the retention of water by the kidneys is secreted in inappropriately increased amounts. This could be ectopically from things like cancers, especially small cell lung tumors. This can also occur as a side effect of some drugs, like the cancer drugs cyclophosphamide, and antidiabetic medications, such as the first generation sulfonylureas, as well as some seizure medications. In some instances, SIADH could be triggered by head trauma, stroke, or some diseases, like HIV. The assessment of SIADH will present as a patient with volume overload, as the kidneys will retain excess water and cause fluid shifts within patient tissue compartments.



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Pathophysiology

Hypersecretion of ADH

Hiker with secreting Ant-tie-die-rocket

Antidiuretic hormone (ADH) is secreted in excess as the normal balance is disrupted. The kidneys respond to the antidiuretic hormone by retaining additional fluid in the body, often in excess.

Increased Sensitivity to ADH

Up-arrow Sensitive-tears at Ant-tie-die-rocket

There are several mechanisms in which SIADH can develop. Besides increased secretion as a cause, the kidneys can develop increased sensitivity to ADH, as the cellular osmostat can be reset. Often, this is caused by medication administration, especially with chlorpropamide, tolbutamide, carbamazepine, mizoribine, nonsteroidal anti-inflammatory drugs, and cyclophosphamide.

Signs & Symptoms

Serum Hypoosmolality

Syrup Hippo-Ozzy

Because this condition causes the normal blood volume to dilute with only free water, the overall osmolality decreases below normal, often less than 280 mOsm/kg. This decreased osmolality in the extracellular space causes fluid to enter the interstitial spaces, causing cellular swelling.

Coma and Seizure

Comb and Caesar

In severe cases of SIADH, there is a tremendous decrease in serum osmolality, leading to marked hyponatremia. If the serum sodium level becomes drastically low, patients are at risk for seizure, stupor, hallucinations and even coma.

Dilutional Hyponatremia

Diluted Hippo-salt-shaker

As the extracellular blood volume is diluted with free water, the sodium level per liter of blood is reduced. This decrease causes many signs of hyponatremia, such as muscle cramps, weakness, fatigue, confusion, and changes in LOC. SIADH can only be diagnosed if serum sodium levels are below normal (<135 mEq/L).

Cramps and Tremors

Clamps and Trimmer

Due to the hypoosmolar state that develops in SIADH, patients become hyponatremic. This electrolyte abnormality has several manifestations, which also include muscle cramping or tremor.

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Euvolemia

U-volume-cup with blood

Patients typically have a normal overall fluid volume status (euvolemia) due to excessive free water reabsorption despite hyponatremia due to excessive secretion into the urine.

Change in LOC

Delta Halo

As hyponatremia worsens with more advanced SIADH, patients may exhibit confusion and personality changes. As sodium level drops below 110 mEq/L, they may progress to a comatose state.

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