Antidiuretic hormone

Science, Anatomy



Antidiuretic Hormone is a nanopeptide, meaning it has nine amino acids (Allain). The hormone is made in the hypothalamus and is transported by axons to be stored in the posterior lobe of the pituitary gland. From there, it is released into the blood circulation when necessary (Bowen). ADH regulates plasma osmolarity, or the concentration of solutes in the blood. Osmoreceptors are neurons that sense the osmolarity and send information to the hypothalamus. When plasma osmolarity is below a certain threshold, the osmoreceptors are not activated and the secretion of ADH is suppressed. When osmolarity increases above the threshold, the osmoreceptors stimulate the neurons that secrete ADH (Bowen). ADH is released from the hypothalamus when osmoreceptor cells in the hypothalamus detect a rise in blood osmolarity, which is normally caused by an excessive loss of water. It reaches the kidneys by blood vessels. Once at the kidneys, the hormone makes distal convoluted ducts more permeable to water so that more is reabsorbed and water is conserved in the blood. The juxtaglomerular apparatus, or JGA, helps the kidney when one has low blood pressure or low blood volume.

When blood pressure drops or there is a lack of sodium in the blood, the JGA releases the enzyme renin into the bloodstream. Renin acts on the plasma protein angiotensin, and turns it into its active form, angiotensin II. Angiotensin II then constricts the arterioles, which raises blood pressure. Raising blood pressure in the arterioles increases filtration (" Hormones of Kidney Regulation"). Antidiuretic hormone has many disorders related to it. The most common disease of man and animals related to ADH isdiabetesinsipidus.

Antidiuretic hormone – Paper Example

Diabetes insipidus is a disorder characterized by intense thirst, despite the drinking of fluids, and the excretion of large amounts of urine. There are four main types of diabetes insipidus: hypothalamis diabetes insipidus, nephrogenis diabetes insipidus, gestational diabetes insipidus, and primary polydipsia (" Diabetes insipidus"). Hypothalamic diabetes insipidus is a deficiency in the secretion of ADH from the posterior pituitary. Causes of the disease include head trauma, and infections or tumors involving the hypothalamus (Bowen).

It is treated with the synthetic hormone, desmopressin. Desmopressin eliminates the increase in urination (" Diabetes insipidus"). Nephrogenic diabetes insipidus is when the kidney is unable to respond to ADH (Bowen). This is caused by renal disease, a genetic disorder, or a chronic kidney disorder. It is treated by a low salt diet, drinking more water, or the drug called hydrochlorothiazide, which reduces urine output. Gestational diabetes insipidus occurs only during pregnancy when an enzyme made by the placenta destroys ADH in the mother.

This is also treated with desmopressin. Primary polydipsia is the excretion of large volumes of dilute urine. It is caused by an intake of excessive fluids or a mental illness. There is no specific treatment other than decreasing the amount of fluid intake, but if the condition is caused by mental illness, treating the mental illness may relieve the symptoms (" Diabetes insipidus"). Another ADH disorder is the syndrome of inappropriate antidiuretic hormone, or SIADH. SIADH occurs when excessive levels of ADH are produced.

It occurs mostly with people with heartfailure, people with a diseased hypothalamus, or a certain type of cancer. Symptoms include nausea, https://assignbuster.com/antidiuretic-hormone/ vomiting, seizures, coma, andpersonalitychanges. It is diagnosed by blood tests, which measure sodium, potassium chloride levels, and osmolality. SIADH is treated by a fluid restriction of between 30 to 75 percent of normal fluid intake or certain medications that inhibit the action of ADH (" Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH)"). Antidiuretic hormone is vital for survival.

The human body would not be able to live without ADH. The small peptide molecule helps control the levels of water and solutions in the body. Without this, when one loses or gains solutes, the body would not know how to react. Works Cited " ADH. " Lab Tests Online. American Association for Clinical Chemistry, 20 Nov. 2012. Web. 14 Apr. 2013. . Allain, Pierre. " Antidiuretic Hormone, ADH or Vasopressin. " Pharmacorama. Pharmacorama, 20 Sept. 2006. Web. 14 Apr. 2013. . Bowen, R. " Antidiuretic Hormone (Vasopressin). Pathophysiology of the Endocrine System. N. p. , 9 Dec. 2006. Web. 14 Apr. 2013. . " Diabetes Insipidus. " Mayo Clinic. Mayo Foundation, 14 Mar. 2013. Web. 14 Apr. 2013. . " Hormones of Kidney Regulation. " Kidney and Nephron. Tripod, n. d. Web. 14 Apr. 2013. . Mullally, Aaron. " Antidiuretic Hormone (ADH {Vasopressin}). " Sophia. Sophia Learning, n. d. Web. 14 Apr. 2013. . " The Children's Hospital of Philadelphia. The Children's Hospital of Philadelphia. The Children's Hospital of Philadelphia. n. d. Web. 14 Apr. 2013. .