

Organs with endocrine functions

Dr. arwa rawashdeh

Kidney

1. Renin- Angiotensin Aldosterone

blood pressure and volume

Antidiuretic hormone (vasopressin) from posterior hypothalamus

2. Erythropoietin (glycoprotein hormone)

Extraglomerular mesangial cells

Hypoxia

Stimulate bone marrow to produce erythrocytes

3. Calcitriol (lipid soluble hormone) and active form of vitamin D

Increase calcium and phosphate in the blood by two ways:

Increase the ability of gut and intestinal cells to absorb more calcium and phosphate

Bone resorption (increases the amount of bone matrix that break down and release calcium and phosphate ion into the blood)

Mechanism of secretion of ADH

Synthesized in Supraoptic nucleus of hypothalamus

Store it in posterior pituitary

Low blood pressure

Angiotension II

High Plasma osmolality

Osmoreceptors

organo vasculosom of lamina terminalis

sub fanikular organ

Effect of ADH

Principle cells in the collecting duct

Binds to V₂ , G stimulatory protein, GTP, adenylate cyclase, ATP, Camp, P.K.A , Aquaporins 2 plug to the membrane

The water passes through into the cell not secreted into the urine

The water moves to the blood

Increase the blood volume and decreases the
Decrease osmolality (isotonic)

Aquaporins 3 and 4 basolateral membrane

Bind to V1 in the blood vessels, vasoconstriction,

Increase TPR, Increase blood pressure

Diabetes insipidus (trauma to the head)

Decreases ADH

Polyuria (water urea)

Polydipsia

Tumor (increase ADH)

Syndrome of inappropriate ADH secretion (SIADH)

Cerebral edema

Heart

Cardiac myocytes in the upper chamber of the heart

Atrial natriuretic peptide

Decrease blood pressure

Vasodilator

Decreases blood volume

Increase Na⁺ excretion

Skin

Cholecalciferol (vitamin D2)

Pre hormone

UV radiation , cholecalciferol in the skin, liver to transform into calcitriol , kidneys

Liver

Angiotensin (regulate blood pressure)

Thrombopoietin (glycoprotein)

Produce platelet (blood clotting)

Pineal Gland or body (third EYE)

Diencephalon (thalamus, hypothalamus (supra chiasmatic nucleus) , epithalamus consist of pineal gland and habenular commissure)

Light , glutamate , supra chiasmatic nucleus (biological clock) , PVN, lateral gray horn, superior cervical ganglion (NE), pineal gland

Tryptophan, 5- hydroxy tryptamine, serotonin, melatonin

NE higher during darkness and increase the melatonin (inhibition)

during the day NE decrease and thus melatonin (stimulation)

Melatonin binds to supra chiasmatic nucleus to regulate Sleep and wake cycle (diurnal cycle)