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Course: physiology

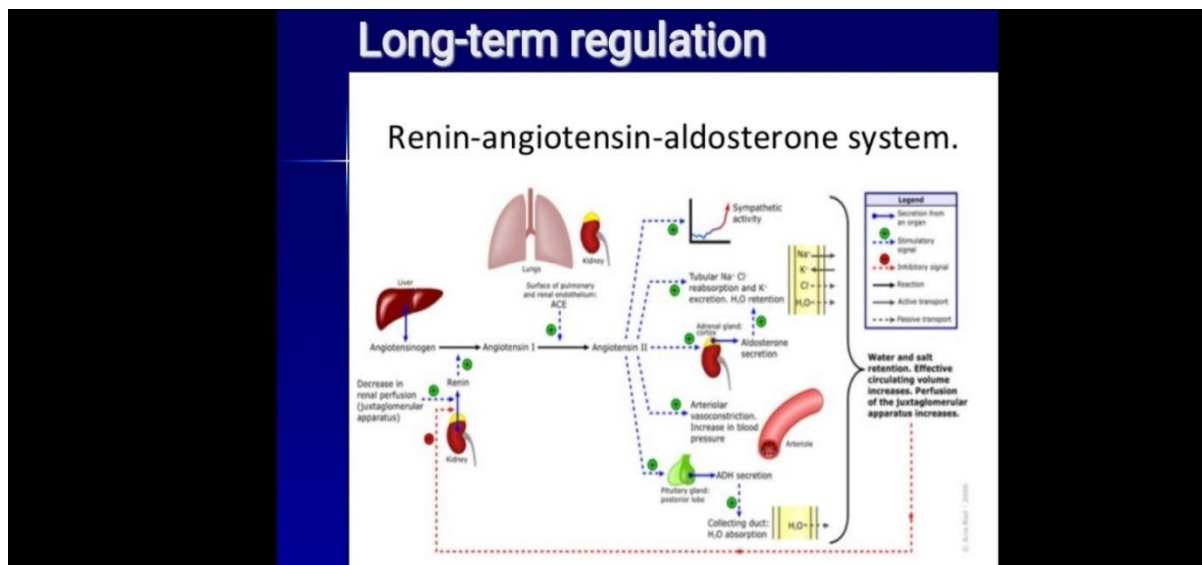
Level: 200

Physiology assignment1

1. Discuss the long term regulation of the mean arterial blood pressure

Renin angiotensin-aldosterone system

Activation of renin-angiotensin system : a decrease in blood pressure causes release of renin from juxtaglomerular apparatus which converts the plasma borne precursor angiotensinogen found in the liver to angiotensin I. angiotensin converting enzyme(ACE) from the surface of the pulmonary and renal epithelium converts angiotensin I to angiotensin II, Ag II which is a potent vasoconstrictor. Ag II increases the total peripheral resistance (TPR) and decreases the glomerular filtration rate (GFR). It stimulates the secretion of aldosterone which causes reabsorption of water and salt from the renal tubules.



2. Write short notes on

I. Pulmonary circulation:

This is the portion of the circulatory system that carries deoxygenated blood away from the right ventricle to the lungs and returns oxygenated blood to the left atrium and it will be passed to the left ventricle through

the mitral valve. The term pulmonary circulation is readily paired and contrasted with the systemic circulation. The vessels of the pulmonary circulation are pulmonary arteries and veins.

II. Circle of wills:

It is a structure located at the base of the brain (around eye level) encircling around the brainstem and the parts of the mid brain that provides a blood supply to the brain and neighboring structures.

More specifically, it is a circulatory anastomosis (arterio-venous anastomosis) that encircles the stalk of the pituitary gland and allows distribution of blood to the brain nearby structures.

Circles of wills also known as the Willis polygon is composed of five main arteries:

- a) Internal carotid artery (left and right)
- b) Anterior cerebral artery (left and right)
- c) Anterior communicating artery
- d) Posterior cerebral artery (left and right)
- e) Posterior communicating artery (left and right)

III. Splanchnic circulation:

It describes the blood flow to the abdominal gastrointestinal organs including stomach, liver, spleen ,pancreas, small intestine and large intestine.it comprises of three major branches of the abdominal aorta; the coeliac artery; superior mesenteric artery (SMA); and inferior mesenteric artery (IMA)

IV. Coronary circulation:

It is the circulation of blood in blood vessels that supply the myocardium .coronary arteries supply oxygenated blood to the heart muscle and cardiac veins drain away the blood once it has been deoxygenated, because the rest of the body and most specially the brain, needs supply of oxygenated blood that is free of all but the slightest interruptions, the heart is required to function continuously. Interruptions of coronary circulation can cause heart attacks in which the heart muscle is damaged by oxygen starvation. Such interruptions are caused by ischemic heart disease and embolism from other causes like obstruction in blood flow in vessels.

V. **Cutaneous circulation:**

It is the circulation of the blood to the skin. The skin is not a very metabolically active tissue and has relatively small energy requirements, so its blood supply is different to that of other tissues.

Some of the circulating blood volume in the skin will flow through arterio-venous anastomoses (AVAs) instead of capillaries. AVAs serve a role in temperature regulation. In this article we shall consider the different adaptations of the cutaneous circulation and its role in temperature control.

3. Discuss the cardiovascular adjustment that occurs during exercise

- a) The baroreceptors detect the need to increase cardiac output.
- b) Baroreceptors stimulates cardiovascular control center.
- c) The cardiovascular control center increases sympathetic activity.
- d) SA node then generates impulse.
- e) Increase heart rate/ stroke volume= increased cardiac output.
- f) Increase in venous return
- g) End diastolic volume increases
- h) Pulse pressure increases

References

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- www.teachmephysiology.com/pulmonarycirculation
- Wikipedia