LAWAL AMINAT MOJISOLA

18/MHS01/204

MEDICINE AND SURGERY

PHYSIOLOGY ASSIGNMENT

1) Discuss the long-term regulation of mean arterial blood pressure?

Ans:

LONG TERM MEAN ARTERIAL BLOOD PRESSURE

The mean arterial blood pressure is the average between diastolic and systolic. The longterm level of arterial pressure is dependent on the relationship between arterial pressure and the urinary output of salt and water, which, in turn, is affected by a number of factors, including renal sympathetic nerve activity (RSNA). regulation is achieved by interdependent adjustments of only 3 parameters: Heart rate(HR), ventricular stroke volume (SV) and total peripheral vascular resistance (TPVR). These are related as follows: HR - SV = Cardiac Output (CO); CO- TPVR = Mean Arterial Blood Pressure. The regulatory system includes stretch sensitive sensors, central nervousintegrators/evaluators and

neuro-humoral effector mechanisms. Central nervous

integration and evaluation of incoming signals occurs mostly

in the pons/medulla regions of the midbrain. The most

important effector mechanisms are the parasympathetic and

sympathetic divisions of the autonomic nervous system, the

renin-angiotensin system and vasopressin. Long-term

regulation involves mainly the regulation of extracellular fluid

volume by pressure natriuresis mechanisms residing in the

kidney and by widespread actions of angiotensin 2. Studies in

hypertensives have suggested that the long-term-controlled

variable is not arterial blood pressure, but the balance between

intake and output of fluid and electrolytes. If the kidney

requires a higher perfusion pressure to achieve that balance

then daily blood pressure regulation occurs around an appropriately higher set point.

2) PULMONARY CIRCULATION

The pulmonary circulation is the portion of the circulatory system which carries deoxygenated blood away from the right ventricle, to the lungs, and returns oxygenated blood to the left atrium and ventricle of the heart. It begins on the right ventricle and ends on the left atrium. In the pulmonary circuit, blood takes up oxygen in the lungs. The pulmonary arteries and veins are unique and the type of blood they carry. pulmonary arteries carry blood low in oxygen from the right side of the heart to the lungs and often contain blue latex. pulmonary veins carry blood rich in oxygen to the left side of the heart and rarely contain any latex.

3) CIRCLE OF WILLIS

The circle of willis s the joining area of several arteries at the bottom (inferior) side of the brain, It helps blood flow from both the front and back sections of the brain. At the circle of willis, the internal carotid arteries branch into smaller arteries that supply oxygenated blood to over 80% of the cerebrum. The circle of willis is a part of the cerebral circulation and is composed of the following arteries: Internal carotid artery (left and right) Posterior cerebral artery (left and right) Posterior communicating artery (left and right)

4) SPLANCHNIC CIRCULATION

The splanchnic circulation consists of the blood supply to the gastrointestinal tract, liver, spleen, and pancreas. It consists of two large capillary beds partially in series. The small splanchnic arterial branches supply the capillary beds, and then the efferent venous blood

flows into the PV. Splanchnic is usually used to describe organs in the abdominal cavity. It is used when describing: splanchnic tissue. Splanchnic organs including the stomach, small intestine, large intestine, pancreas, spleen, liver, and may also include the kidney.

5) CORONARY CIRCULATION

It is the circulation of blood in the blood vessels that supply the heart muscle (myocardium). coronary arteries supply oxygenated blood to the heart muscle, and cardiac veins drain away the blood once it has been deoxygenated. From the tissue capillaries, the

deoxygenated blood returns through a system of veins to the right atrium of the heart. The coronary arteries are the only vessels that branch from the ascending aorta. The brachiocephalic, left common carotid, and left subclavian arteries branch from the aortic arch. Coronary arteries supply blood to the heart muscle. Like all other tissues in the body, the heart muscle needs oxygen- rich blood to function Also, oxygen- depleted blood must be carried away. The coronary arteries wrap around the outside of the heart.

6) CUTEANEOUS CIRCULATION

The cuteaneous circulation is the circulation and

blood supply of 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. You can improve circulation to your skin by exercise, drinking lots of water, elevating your legs, cutting back on alcohol e.t.c.

7) CARDIOVASCULAR ADJUSTMENT DURING EXERCISE

During exercise, increases in cardiac stroke volume and heart rate raise cardiac output, which coupled with a transient increase in systemic vascular resistance, elevate mean arterial blood pressure. During exercise, more blood is sent to the active skeletal muscles, and, as body temperature increases, more blood is sent to the skin. This process is accomplished both by the increase in cardiac output and by the redistribution of blood flow away from areas of low demand, such as the splanchnic organs.

Exercise causes the heart to pump blood into the circulation more efficiently as a result of more forceful and efficient myocardial contractions, increased perfusion of tissues and organs with blood, and increased oxygen delivery. Aerobic exercise trains the heart to become more efficient.