CLASS-11

BODY FLUIDS AND CIRCULATION REGULATION OF CARDIAC ACTIVITY

REGULATION OF CARDIAC ACTIVITY

Normal activities of the heart are regulated intrinsically, i.e., auto regulated by specialised muscles (nodal tissue), hence the heart is called myogenic. This automatic rhythm is produced by the spontaneous depolarisation, which leads to contraction of heart.

- Nervous Control: A special neural centre in the medulla oblongata (in the brain) can moderate the cardiac function through autonomic nervous system (ANS). Sympathetic and parasympathetic nerves (parts of ANS) are connected to the heart and can modify the rate of spontaneous depolarization of the SA node. Sympathetic nerve endings release noradrenaline which stimulates the SAN that accelerates the heartbeat, the strength of ventricular contraction and thereby the cardiac output. On the other hand, parasympathetic nerve endings release acetylcholine which decreases the rate of heart beat, speed of conduction of action potential and thereby the cardiac output.
- Hormonal Control: The adrenal medulla secretes two hormones called adrenaline and noradrenaline. Both the hormones are rapidly secreted in response to stress of any kind and during emergency situations. These hormones increase the heart beat and the strength of heart contraction. Thus adrenal medullary hormones can also increase the cardiac output.
- High levels of potassium and sodium decrease heart rate.
- An excess of calcium ions increase heart rate.