

Review on Cardiological Activity

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ABSTRACT:

To study the heart it's function related disorders and therapies.

Cardiology is a branch of medicine that deals with disorders of the heart and the cardiovascular system. The field includes medical diagnosis and treatment of congenital heart defects, coronary artery disease, Heart failure, valvular heart disease and electrophysiology.[2]

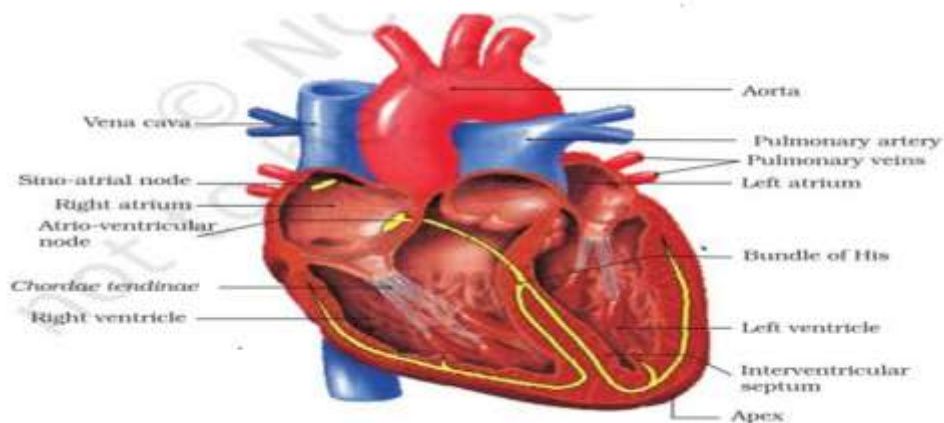
William Harvey, English physician who was the first to recognize the full circulation of the blood in the Human body and to provide experiments and arguments to support this idea. Harvey's greatest Achievement was to recognize that the blood flows rapidly around the human body, being pumped Through a single system of arteries and veins, and to support this hypothesis with experiments and Arguments.[12]

Best known for: William Harvey was the first person to correctly describe blood's circulation in the body. He showed that arteries and veins form a complete circuit that starts at the heart and leads back to the Heart.[7]

Key words:

- 1.Heart
- 2.Blood
- 3.Disease

Internal structure of Heart:



4.Veins

I. INTRODUCTION:

To study the heart it's function related disorders and therapies.

Cardiology is a branch of medicine that deals with disorders of the heart and the cardiovascular System. The field includes medical diagnosis and treatment of congenital heart defects, coronary Artery disease, heart failure, valvular heart disease and electrophysiology.[2]

Do you know how the nutrients and oxygen are supplied to every part of the body?

You know that even a small cut on the body causes bleeding. After sometime blood clots and Prevents excessive loss of blood. Blood transports all nutrients and oxygen to every cell. The System in which blood is circulated throughout the body is called circulatory system. Closed Circulatory discovered by William Harvey (1628).[1]

In this review you will study the structure and function of different organs of circulatory system. In addition to this you will also study how the dysfunction of the circulation causes various Disorders.

Internal structure of heart

Heart:

Human heart is situated almost in the middle of thoracic cavity in a space called mediastinum, Between the two lungs. Heart is hollow, muscular, conical organ about the size of one's fist with Broad base and narrow apex tilted towards left. Heart is of mesodermal in origin. It measures about 12 cm in length, 9 cm in breadth and weighs about 250 to 300 gram. [1]

Pericardium— Heart is enclosed in double layered peritoneum called pericardium.

It Consists of two layers-

Fibrous Pericardium- It is the outer layer made up of tough,inelastic fibrous connective Tissue.[1]

Serious pericardium-It is the inner layer made up of outer parietal layer and inner visceral layer. The parietal layer forms lining of fibrous pericardium whereas the visceral layer or epicardium adheres to heart Forming its outer covering. [1]

In between the parietal and visceral layers of serous pericardium is present pericardial space filled With pericardial fluid. [1]

Heart wall- The wall of heart is composed ofthree layers viz. Outer epicardium, middle Myocardium and inner endocardium. [1]

Epicardium- is composed of single layer of flat epithelial cells called mesothelium. [1]

Myocardium – is composed of cardiac muscle fibres responsible for contraction (systole) and Relaxation (diastole) of heart.[1]

Endocardium- is composed of single layer of flat epithelial cells called endothelium.[1]

Internally the heart is four chambered with two **atria** and **ventricles**.

Atria:

The atria are two thin walled receiving chambers placed superiorly and separated from each other by interatrial septum. The right atrium by receives deoxygenated blood from all over the body through superior vena cava, inferior vena cava and from heart through coronary sinus.[1]

The opening of inferior vena cava is guarded by Eustachian valve while the opening of coronary sinus is guarded by Thebesian valve.

An Oval depression, the fossa ovalis is present on the right side of interatrial septum. It represent the remnant of foramen ovale, an oval opening in the interatrial septum of the foetus. [1]

The left atrium receives oxygenated blood from the lungs through four openings of pulmonary veins. Each atrium opens into the ventricle of its side by through atrioventricular apertureguarded by valves made up of connective tissue. The right atrioventricular valve has three flaps hence called tricuspid valve.[1]

Left atrioventricular valve has two flaps hence called bicuspid valve or mitral valve. These valves are attached to papillary muscles of ventricles by chordae tendinae. The chordae tendinae prevent The valves from turning back into the atria during the contraction of ventricles. [1]

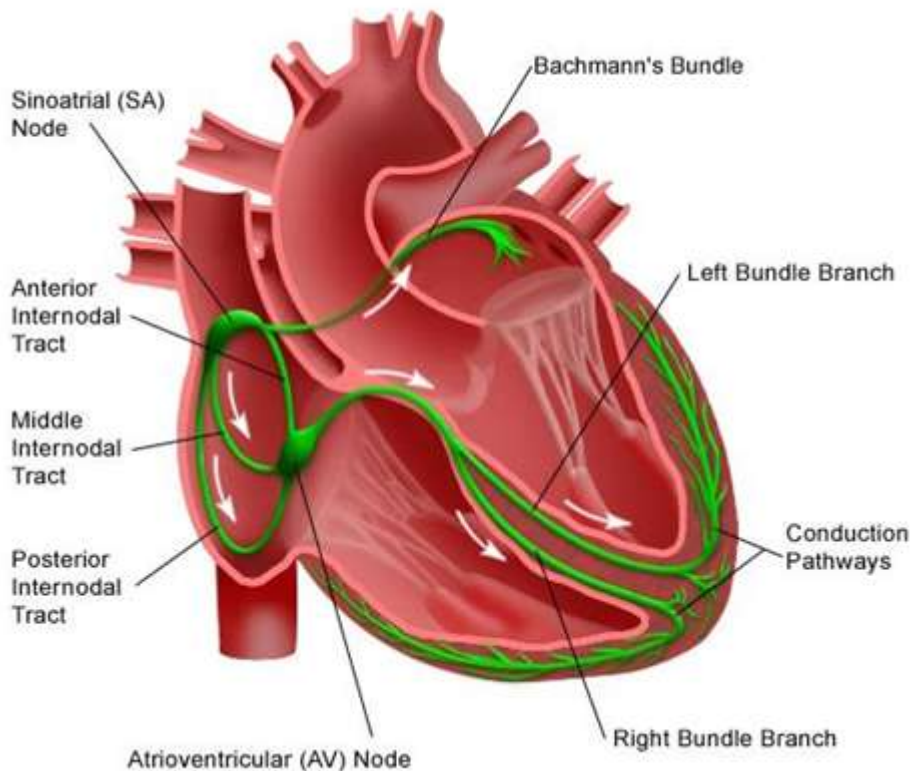
Ventricles:

The ventricles are two thick walled distributing chambers placed inferiorly and separated from each other by interventricular septum. Left ventricle has thickest wall as it has to pump blood to all parts of the body. The inner surface of the ventricle is thrown into a series of irregular muscular ridges called columnae carnae or trabeculae carnae. [1]

Pulmonary trunk or aorta arises from the right ventricle carrying deoxygenated blood to lungs for Oxygenation. Systemic aorta arises from left ventricle carrying oxygenated blood to all parts of the Body. Pulmonary aorta and systemic aorta has three semilunar valves at the base which prevent Backward flow, of blood during ventricular diastole.[1]

Pumping action of Heart:

The heart acts as a pumping organ. The rhythmic contraction (systole) and relaxation (diastole) of heart is called heart beat. The heart beats about 72 times per minute and pumps about 5 litres of Blood per minute.[1]



Conducting system of heart:

Human heart is myogenic (myo-muscle, genic-originating from). The heart beat originates in modified cardiac muscles called Sinoatrial node (SA node) which lies in the wall of right atrium near the opening of superior vena cava. The SA node is called pace maker because it has power of generation of wave of contraction. The wave of contraction or cardiac impulse generated by SA Node is conducted by cardiac muscle fibres to both the atria causing their contraction (atrial systole).[1]

The atrioventricular node (AV node) is located in the wall of right atrium near the opening of coronary sinus receives the wave of contraction generated by SA node through internodal pathways.[1]

Bundle of his:

Bundle of His arises from AV node and divides into right and left bundle branches located in the interventricular septum. The bundle branches give rise to Purkinje fibres which penetrate into myocardium of ventricles. The bundle of His and Purkinje fibres conduct the wave of contraction from AV node to myocardium of ventricles causing their contraction (ventricular systole).[1]

Working of heart (Cardiac cycle):

The events associated with one heart beat is called cardiac cycle. It lasts for 0.8 seconds. Each heart beat includes atrial systole, ventricular systole and joint diastole. [1]

Cardiac related Disorders:

I)Coronary artery disease(CAD):

Coronary artery disease refers to a condition such as atherosclerosis, that causes narrowing of coronary arteries so that the blood flow to the heart is reduced. This results in coronary heart disease, a condition in which the heart muscle of is damaged because of an inadequate amount of blood due to obstruction of its blood supply.[1]

Forms of coronary artery disease:

There are two main forms of coronary artery disease.

- Stable ischemic heart disease
- Acute coronary syndrome:

Symptoms of CAD:

Shortness of breath (dyspnea)

Heart palpitations.

Feeling tired.

Nausea, stomach discomfort or vomiting. This may feel like indigestion.

Weakness.

Diagnosis:

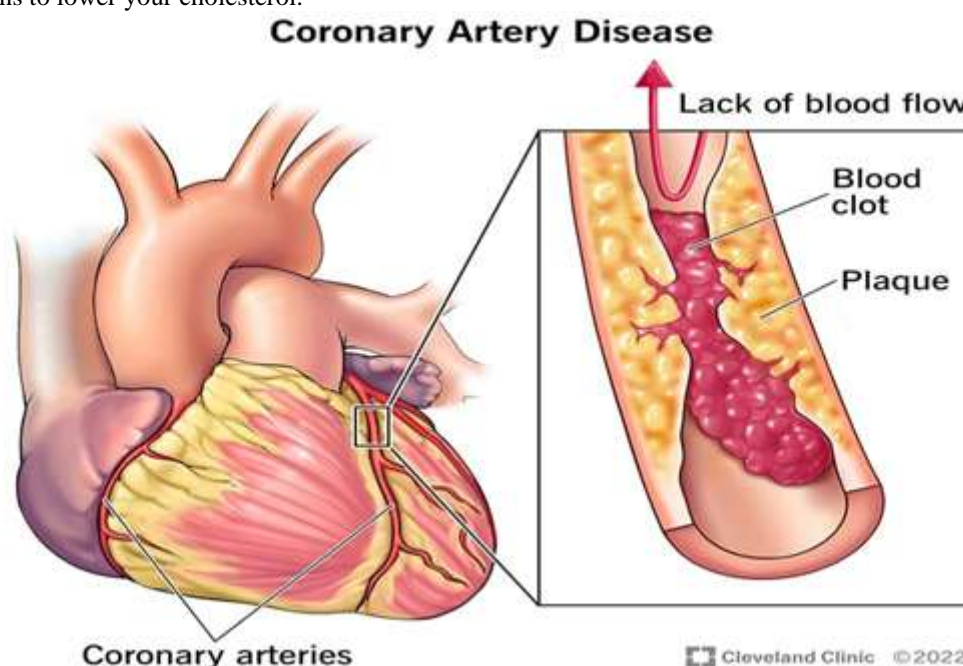
Test	What it does
ECG or EKG (electrocardiogram)	Measures the electrical activity, Regularity heart
Electrocardiogram To create a picture of the heart	Uses ultrasound (special sound wave)

Treatment and management:

Medications to lower your blood pressure

Medications to lower your cholesterol.

Medications to manage stable angina. These include nitroglycerin and re colonize.



Drugs used Treatment of Coronary artery disease:

I. Statins:

1. Atorvastatin (Lipitor)
2. Fluvastatin (Lescol)
3. Pravastatin (Lipostat)
4. Rosuvastatin (Crestor)
5. Simvastatin (Zocor)

II. Anticoagulant:

1. Warfarin. 2. Heparin

III. Antianginal:

- Amiodarone.
- Nitrite.
- Diltiazem.
- Verapamil.
- Propranolol.

Surgeries or other procedures:

- 1) Coronary angioplasty and stent placement

This procedure is done to open clogged heart arteries. It may also be called percutaneous coronary intervention (PCI). The heart doctor (cardiologist) guides a thin, flexible tube (catheter) to the narrowed part of the heart artery. [10]

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- 2) Coronary Bypass surgery:

Coronary bypass surgery redirects blood around a section of a blocked or partially blocked artery in your heart. The procedure involves taking a healthy blood vessel from your leg, arm or chest and connecting it below and above the blocked

arteries in your heart. With a new pathway, blood flow to the heart muscle improves.[11]

II)Hypertension:

Thermal blood pressure is 120 mm Hg (systolic) and 80 mm Hg (diastolic). Hypertensions or High blood pressure is the occurrence of persistent systolic arterial blood pressure of more than 140mm Hg. Arterial blood pressure of more than 90 mm Hg.Excessive high blood pressure of about 220/ 120mm Hg may cause rupturing of blood vessels of eyes .[1]

Hypertension is caused by severalfactors like arteriosclerosis, atherosclerosis, obesity, physical or emotional stress, alcoholism, smoke-ing, cholesterol rich diet, increased secretion of rennine,epinephrine or aldosterone etc.[1]

Symptoms:

Blurry or double vision
Light-headedness/Fainting
Fatigue
Headache
Heart palpitations
Nosebleeds
Shortness of breath

Drugs used in treatment of Hypertension:

The classes of blood pressure medications include:

*Diuretics:

1)chlorhexidine 2)furosemide

*Beta-blockers:

1)acebutol 2)atenolol

*ACE inhibitors:

1)Captopril. 2) ramipril

*Angiotensin II receptor blockers:

1)telmisartan. 2)valsartan

II. CONCLUSION:

Cardiovascular disease (CVD) is a general term that describes a disease of the heart or blood vessels. Blood flow to the heart, brain or body can be reduced because of a: blood clot (thrombosis) build-up of fatty deposits inside an artery, leading to the artery hardening and narrowing (atherosclerosis).[8]

While cardiovascular surgery isn't always necessary to treat heart problems, doctors may recommend it for a variety of reasons, including treating or preventing heart attacks and blood clots, addressing irregular heartbeats, opening blocked or narrowed arteries, repairing congenital heart problems, and fixing damaged.[9]

The future of cardiac surgery hinges on the surgeon's ability to improve techniques, innovate in therapies, and diversify practice.

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