

DISORDERS OF SA NODE:

What is normal heart rate [HR]? Regulates it is called.

⇒ If the heart rate is normal and regulates it is called normal sinus rhythm which is about 70 bpm.

⇒ In sinus rhythm, SA node is the pacemaker.

⇒ If rate is >100 - sinus tachycardia

⇒ If the rate <60 beats/min - sinus bradycardia

SINUS TACHYCARDIA:

Causes:

- ⇒ Anxiety
- ⇒ Fever
- ⇒ Exercise
- ⇒ Drug toxicity
- ⇒ Cardiac failure

SINUS BRADYCARDIA:

HR < 60 bpm

Causes:

- ⇒ Strong athletes
- ⇒ Sick sinus syndrome
- ⇒ Beta blockers
- ⇒ Myxedema

SICK SINUS SYNDROME:

The impulse generation from SA node is defective.

⇒ Decrease in HR due to periods of absent activity of SA node or failure of conduction of impulse from SA node to internodal tract.

⇒ C/P: bradycardia, dizziness, syncope

SINUS ARRHYTHMIA:

⇒ Change in HR during different phases of respiration is called sinus arrhythmia

⇒ HR increases in inspiration and decreases in expiration.

ATRIAL FLUTTER:

⇒ Rate of discharge of atrial impulse is b/w 200-350 bpm.

⇒ Because of AV nodal delay, all these impulses do not reach the ventricles.

⇒ Typically, flutter [F] wave shows sawtooth pattern of P wave.

ATRIAL FIBRILLATION:

⇒ Atria beat very rapidly (300-500 bpm) in a completely irregular and disorganised fashion.

⇒ Because the AV node discharge at irregular intervals, the ventricle beat at a completely irregular rate, usually 80-160 bpm.

ventricular rate

CONDUCTION DISORDERS:

HEART BLOCK:

Conduction block [Heart block]

→ It is the disturbance in the normal transmission of impulses generated in SA node.

Cause: coronary artery disease.

Conduction blocks: (heart blocks).

Types: 1) SINOATRIAL NODAL BLOCK.

2) ATRIOVENTRICULAR BLOCK

3) BUNDLE BRANCH BLOCK.

1) SAN BLOCK:

Block within the substance of SAN.

Initially whole heart beat is lost.

ie, neither atrial nor ventricular contraction seen.

After an interval of approx 2 cardiac cycle the heart resumes its normal action as some new pacemaker either SAN takes over.

2)

ATRIO VENTRICULAR BLOCK:

Delay in transmission of impulses from Atria to ventricles. Contraction occurs.

After an interval of approx 2 cardiac cycle the heart resumes its normal action.

2 Types:

1) Incomplete block.

2) Complete block.

Incomplete heart-block (IHB):

Partial disturbance of conduction b/w Atria and ventricle.

2 types:

1) 1st degree IHB.

2) 2nd degree IHB.

① Wobitz type I block.

② Wobitz type II block.

First degree Incomplete IHB:

All the Atrial impulses reach the ventricle but the conduction of impulse is slowed due to increased delay in AV node.

so PR interval is Abnormally Prolonged.

Second degree Incomplete IHB.

Wobitz type I heart block:

→ All Atrial impulses are not conducted to ventricle.

is disrupted. Then again normal pattern with prolongation of P-R-T observed.

⇒ The cycle is repeated. This is called Wenckebach phenomenon. It is ventricular.

⇒ All Atrial Impulses are not conducted. It is ventricular. Accordingly it is called 2:1 or 3:1 block.

⇒ Mobitz type Block [2:1 block]: one QRS complex is formed in 2:1 block for every 2 P waves.

⇒ Complete third degree heart block (H1P2) Atria and ventricle

⇒ Complete interruption of conduction b/w Atria and ventricle

⇒ Atria and ventricle beat separately. It is called independent.

⇒ Due to dissociation of AVN & bundle branch block.

⇒ ECG - no correlation b/w P wave and QRS wave.

ECG interpretation of third degree heart block

⇒ Complete heart block develops suddenly, there is a delay before ventricle starts beating at their own rate.

⇒ During this period, the systemic blood pressure falls at very low level as blood supply to brain becomes inadequate. (cerebral ischaemia) leads to unconsciousness.

⇒ If ventricle starts still for few seconds. It causes dizziness and fainting called Stokes Adams syndrome.

⇒ If it more prolonged (seconds/min), it leads to death. Loss of consciousness, convulsions and death.

CONDUCTION ACCELERATION DISORDERS: WOLFF - PARKINSON WHITE (WPW) SYNDROME

Normally the only conducting pathway b/w the Atria and ventricle is the AV node.

Here, they have an additional bypass pathway called the bundle of Kent that connects atria and ventricle.

This conducts impulses more rapidly than AV node and bundle of Kent to the ventricle which become excited early.

The QRS complex of this premature activation merge with normal QRS so that QRS complex is not altered and it is called in its upstroke.

PJ interval is normal

Accelerated AV conduction.

top: Normal sinus beat

middle: short PR interval, as in
short QRS complex, normal QT

interval (WPW)

Better: short PR interval

normal QRS complex

short PJ interval