

Cardiac arrhythmia

- It is a disturbance of the electrical rhythm of the heart, usually underlying heart disease but also normal heart. Bradyarrhythmia ≥ 60 / min
Tachycardia ≥ 100 beats / min.

Vagal nerve \rightarrow ↓ Heart Beat
Sympathetic nerve \rightarrow ↑ Heart Rate by catecholamines.

Tachycardia \rightarrow
① Increased automaticity \rightarrow Ectopic, by sympathetic
② Reentry circuit \rightarrow
③ Triggered activity \rightarrow Early depolarization before repolarization occurs.

Bradycardia \rightarrow
① Decreased automaticity \rightarrow Atrophy
② Conduction block

Classified

① Supraventricular \rightarrow Narrow QRS complex
② Ventricular \rightarrow Broad QRS complex

Sinus Arrhythmia

- Cyclic alteration of the heart rate with respiration, ↑ during inspiration and ↓ during expiration.

- It is normally present in human, if absent, may there is diabetic neuropathy, peripheral nerve disease or increased sympathetic drive.

Sinus Bradycardia

- More common in adults, and while sleeping.
- Causes: → MI, Sick sinus syndrome, Hypothyroidism, Hypofunction. ↑ Intracranial pressure, Drugs.
- Usually asymptomatic, may occur with MI.
- If Persistent, pacemaker should be placed.

Sinus Tachycardia

- Usually due to an increased sympathetic activity with exercise, pregnancy, emotion, Anemia, Heart failure. Thyrotoxicosis.

Sick sinus Syndrome (Sinoatrial disease)

- Most often in old age.
- Caused by fibrotic degenerative changes or ischemia of SA nodes.
- C/F: Palpitation, dizzy spells, syncope, due to intermittent tachycardia, bradycardia.
- On paroxysm with no atrial or ventricular activity.

Features → Sinus bradycardia,

Sinoatrial block

Paroxysmal atrial fibrillation

Paroxysmal atrioventricular tachycardia.

Atrioventricular block

Treatment → Permanent pacemaker

Atrial ectopic beats

- Missed heart beat sensation or abnormally strong beat
- ECG: → P wave has different morphology due to different site, normal QRS complex

Atrial tachycardia - Abnormal P wave

→ Increased automaticity. due to sinoatrial disease

Atrial Fibrillation

Quivering of atria

Most common type of cardiac arrhythmia.

Causes

- 1) Coronary heart disease
- 2) Valvular Rheumatic Mitral valve disease
- 3) Hypertension
- 4) Hyperthyroidism
- 5) Alcohol, Diabetes, obesity
- 6) Congenital heart disease
- 7) Cardiomyopathy
- 8) Chest infection
- 9) Pulmonary disease
- 10) Pericardial disease

Pathogenesis

Risk Factors

Stroke atrium

↑ fibrillate heterogeneity

Some cells conduct faster ↓ refractory

Some cells conduct slower ↓ at. period

Multiple wavelet theory

Automatic Focus

Theory (Pulmonary veins on diseased atrium)

Reentry circuit

Multiple reentry

Automatic fibrillation

Arrhythmia

"Irregularly Irregular Pulse"

Irregular pulse

Blood stagnation

Formation of thrombus

Thromboembolic disease

Formation of emboli

Classification

Paroxysmal AF ~ (< 1 week).

Persistent AF - (> 1 week to months)

without self terminating

Permanent AF - > 1 month. \hookrightarrow Holter monitor

Clinical Features

- Palpitation, Fatigue, Dizziness, weakness.

due to low cardiac output.

- Irregular, irregular pulse (100-175 bpm)

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Investigations: ECG \rightarrow No P waves, but baseline shows

irregular fibrillation waves.

Normal QRS complex but irregular.

- Echocardiography \rightarrow Other disease

- Thyroid disorder should be excluded

Complications:

Blood stagnation \rightarrow clots \rightarrow stroke

Thromboembolism

Treatment

- Pacemaker

- Rhythm control

- Rate control, Thromboprophylaxis

- Atrial flutter

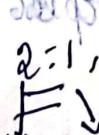
- Larger re-entry circuit around tricuspid.

- Atrial rate is 300/min.

- ECG: Saw tooth flutter waves.

Narrow QRS complex

2:1, 3:1, 4:1 AV block



Atrial beat

Ventricular beat

\rightarrow Prolonged Tachycardia.

\hookrightarrow ventricular decompensate

\rightarrow thrombosis \hookrightarrow heart failure

Atrio-ventricular block

First degree AV Block \rightarrow Prolonged PR interval

Second degree AV Block - Type I: P-R, Escape beat

Type II: Intermittent dropped

Third degree AV Block \rightarrow Signals blocked completely.

- Disease of A V Node \rightarrow No signals \rightarrow

C/F:

Stoker Adams attacks (Recurrent syncope)

- Sudden loss of consciousness that occurs without any warning and results in collapse

- A brief anoxic episode due to cerebral ischemia

If prolonged arythmia during attack

- Pallor, death-like appearance during attack

- When the heart starts to beat there is characteristic flutter

- In distinction to Epilepsy there is rapid recovery

- D/D occurs in gynaecological disorders and neurocardiogenic syncope

Bundle Branch Block

Right and left Bundle Branch Block

↓
Right ventricular hypertrophy, Hypertension, CAD.

Left ventricular hypertrophy, Cardiomyopathy.

ECG: Prolonged QRS complex

- If there is block after the left bundle

into anterior and posterior fascicles.

It is called hemiblock. Note: QRS complex broadens.

↓
Left bundle branch block

↓
Left bundle branch block

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Left bundle branch block

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Left bundle branch block