NEONATAL CARDIAC CONDITIONS:

SURGICAL AND MEDICAL MANAGEMENT

CARDIAC ARRHYTHMIAS

SINUS BRADYCARDIA
Regular heart rate < 90 bpm awake or < 80 bpm asleep.

EPIDEMIOLOGY
Common, transient.

PATHOPHYSIOLOGY
- High vagal tone in newborns.
- Raised intracranial pressure presenting with bradycardia rare.

CLINICAL PRESENTATION
- Normal sinus rhythm.
- Normal rate variation with respiration, stress, activity.
- Normal CVS examination.

INVESTIGATION
12 lead ECG to exclude AV (Heart) Block.

MANAGEMENT
Cardiac opinion if structural heart disease suspected.

PROGNOSIS
Excellent, transient, resolves over few days.

ATRIAL ECTOPIC BEATS
(AEB’s, APB’s, AEC’s).
DEFINITION
Narrow complex premature contractions focus away from the sinus node.

EPIDEMIOLOGY
Common, 1-2% normal newborns and infants.

PATHOPHYSIOLOGY
- Structural heart disease generally absent.
- Electrolyte disturbance.

CLINICAL PRESENTATION
Irregular pulse, normal rate.

FINDINGS
Normal CVS examination usual.

COMPLICATIONS
- Haemodynamic disturbance/hydrops uncommon.
- Atrial bigeminy frequent.
- Blocked APB’s may mimic sinus bradycardia, AV block.
- Progression to SVT uncommon.

INVESTIGATIONS
- 12 lead ECG.
- Cardiac consult if structural heart disease suspected.

MANAGEMENT
Nil required.

PROGNOSIS
Excellent.

VENTRICULAR ECTOPICS
(VEB’ s, VPB’s, PVC’ s).

DEFINITION
- Premature wide complex beats, arise from ventricular focus.
- AV dissociated, inverted T wave.

EPIDEMIOLOGY
VEB’s common, occur 1-2% normal newborns.

PATHOPHYSIOLOGY
- May relate to normal transient high vagal tone.
- Electrolyte disturbance occasionally presents with VEB’s.
- Generally arise in structurally and functionally normal hearts.
- Rarely associated with structural heart disease.
• Includes Cardiac tumours in Tuber Sclerosis.

**CLINICAL PRESENTATION**
Irregularly irregular pulse.

**FINDINGS**
Normal CVS examination usual.

**COMPLICATIONS**
- Ventricular bigeminy common and benign.
- Haemodynamic compromise uncommon.
- Progression to ventricular tachycardia rare.

**INVESTIGATIONS**
12 lead ECG.
Cardiac consult if structural heart disease suspected.

**MANAGEMENT**
Nil.

**PROGNOSIS**
Relates to associated structural/functional abnormality.

**SUPRAVENTRICULAR TACHYCARDIA**

**DEFINITION**
Narrow complex tachycardia rate>230 bpm, regular with hidden, normal or retrograde P waves, occasionally wide complex associated with abberancy.

**PATHOPHYSIOLOGY**
- Generally occurs in structurally normal heart.
- Rarely associated with CHD.
- May present in utero with hydrops.
- AV re-entry +/- accessory pathway Wolf Parkinson White (WPW) usual/common mechanism.
- Atrial Flutter, Atrial ectopic tachycardia less common.

**CLINICAL PRESENTATION**
- Generally haemodynamically stable, asymptomatic if duration < 6 hrs.
- Duration > 6 hrs increasing likelihood symptoms (poor feeding, respiratory distress, pallor).
- Rarely present in shocked, hypotensive, acidotic state.

**FINDINGS**
- Tachycardia generally >230 bpm.
- Respiratory distress, pallor, hypotension, acidosis.

**INVESTIGATIONS**
- 12 lead ECG.
- ECG strip recording during reversion.
- IV Adenosine may be diagnostic in Flutter, wide complex SVT.

**MANAGEMENT**
- Vagal manoeuvres include facial icy water.
- IV Adenosine can be used safely even in presence of haemodynamic compromise.
- Digoxin, Flecainide may be used if stable and don’t respond.
- Synchronised DC cardioversion in emergency.
- Digoxin 1st line chronic therapy.
- Propranolol, Flecainide, Sotolol 2nd line.

**PROGNOSIS**
- Excellent, generally resolves over 9-12/12.
- Small number recur later in life, typically 7-12 yrs.

**COMPLETE AV (HEART) BLOCK**

**DEFINITION**
Abnormality atrio-ventricular conduction.

**EPIDEMIOLOGY**
Uncommon, Congenital CHB 1 PER 20000.

<table>
<thead>
<tr>
<th>1°</th>
<th>Rarely structural heart disease. An example of 1° heart block is Ebsteins anomaly</th>
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</thead>
<tbody>
<tr>
<td>3°</td>
<td>Maternal autoantibodies (lupus), Anti Ro, Anti La, Associated complex CHD – Left Atrial Isomerism, Corrected Transposition, (AV/VA discordance)</td>
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<tr>
<td>2° 3°</td>
<td>Rare, presentation in LQTS</td>
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**CLINICAL PRESENTATION**
May present in utero with bradycardia/hydrops.

**FINDINGS**
- Relative bradycardia, abnormal responses to stress, activity.
- HR generally < 80 awake or asleep.
- AV dissociation.
- Narrow complex escape rate usual in newborns, infants children.

**COMPLICATIONS**
- Haemodynamic compromise.
- Relates to associated CHD.
- Relates to rate, common if rate < 60 in normal heart.
- Lower rates may not be tolerated in abnormal heart.
- Lupus related CHB associated with dilated cardiomyopathy ~5%.

**MANAGEMENT**
- 12 lead ECG.
- Cardiac consultation.
PROGNOSIS

- Pacing if symptomatic, HR < 55-60, frequent VPB’s, LQTS.
- Prognosis guarded.
- Poor if associated with CHD, presents with hydrops.