DOI: https://doi.org/10.4038/jccp.v54i2.8035

ECG quiz – Answers

Answer 1

1.1. Three (03) abnormalities

- Sinus tachycardia
- Low voltage complexes
- Electrical alternans

1.2. Cardiac Tamponade

The classic triad of ECG abnormalities in cardiac tamponade include sinus tachycardia, low voltage QRS complexes in both limb leads and precordial leads and electrical alternans. The presence of a large volume of fluid in the pericardial sac may dampen the electrical conduction between the heart and ECG electrodes causing low amplitude QRS complexes in both precordial and limb leads. Electrical alternans is identified as consecutive QRS complexes that alternate in height because of heart swinging backwards and forwards inside large pericardial effusion.

Answer 2

2.1. Three (03) abnormalities

- Sinus tachycardia
- Low voltage complexes especially in limb leads
- Tall P waves in L_2 and V_1 leads

2.2. Exacerbation of chronic obstructive pulmonary disease

ECG abnormalities in chronic obstructive pulmonary disease are due to the presence of emphysematous lungs, pulmonary hypertension and subsequent right atrial dilatation and right ventricular hypertrophy and tachycardia caused by exacerbation of the disease condition. The presence of increased air in emphysematous lungs may dampen the electrical conduction between the heart and ECG electrodes causing low amplitude QRS complexes, especially in the limb leads. Chronic hypoxaemia overtime leads to pulmonary hypertension causing right atrial dilatation and right ventricular hypertrophy. Right atrial dilatation is identified by tall P waves in L_2 lead and tall or biphasic P waves in V_1 lead. Having a P wave taller than a R wave in L_2 lead is characteristic in chronic obstructive airways disease. Right ventricular hypertrophy can be identified by a positive R wave in V_1 with right ventricular strain. Both right arial dilatation and right ventricular hypertrophy may cause rightward P wave axis and QRS axis respectively. Exacerbation of chronic obstructive airways disease may cause sinus tachycardia or multifocal atrial tachycardia.

Answer 3

3.1. Two (02) abnormalities

- Narrow complex tachycardia with a ventricular rate of approximately 150 beats per minute
- Retrograde P waves with long RP interval

3.2. Atrioventricular re-entry tachycardia (AVRT) with orthodromic conduction.

Atrioventricular re-entry tachycardia (AVRT) is a form of paroxysmal supraventricular tachycardia usually due to a formation of a re-entry circuit between the AV node and an accessory pathway connecting atria and ventricles. The ECG abnormalities depend on the direction of the electrical conduction, which can be orthodromic or antidromic. In orthodromic AVRT, anterograde conduction is via the AV node, producing a regular narrow complex rhythm while in antidromic AVRT, anterograde conduction is via the accessory pathway. Bothe re-entry circuits are often triggered by premature atrial or ventricular beats. In orthodromic AVTR, anterograde conduction occurs via the AV node, resulting in narrow complex tachycardia with a ventricular rate of 150-200 bpm and retrograde P waves with long RP intervals. Electrical alternans in QRS complexes and rate related ischaemia are also commonly associated ECG abnormalities.

Answer 4

4.1. Two (02) abnormalities

- Broad complex tachycardia with a ventricular rate of approximately 130 beats per minute
- Terminal right axis deviation with a positive R wave in avR

4.2. Tricyclic antidepressant toxicity

Characteristic ECG abnormalities of tricyclic antidepressant toxicity include wide QRS complexes (>100 ms) due to intraventricular conduction delay and terminal right axis deviation of the QRS complex with a positive R wave in aVR. These ECG abnormalities are caused by the sodium channel blockage of the intraventricular conduction system by tricyclic antidepressants. The right sided intraventricular conduction system is more susceptible to the effects sodium channel blockage thus producing terminal right axis deviation or the QRS complex. Patients with tricyclic antidepressant toxicity also develop sinus tachycardia or ventricular tachyarrhythmia.

CME Cardiology; Self-assessment questions (Single best response)

Answers

1. (a)
2. (b)
3. (b)
4. (b)
5. (e)
6. (d)