ECG PUZZLER

A regular feature of the American Journal of Critical Care, the ECG Puzzler addresses ECG interpretation for clinical practice. We welcome letters to the Editors regarding this feature.

Non–Conducted P Waves

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Scenario: The following ECG waveform was obtained in an 85-year-old male patient admitted to the telemetry unit for evaluation of syncope. His pertinent medical history includes hypertension, coronary artery disease, and prior inferior/lateral myocardial infarction (MI).

For every ECG, we recommend you systematically examine the following 9 features (check all that apply):

1. Rate
   - Normal (60-90 beats per minute)
   - Bradycardia (<60 beats per minute)
   - Tachycardia (>90 beats per minute)

2. Rhythm
   - Regular
   - Irregular

3. P waves
   - One P wave for every QRS complex
   - Fewer P waves than QRS complexes
   - More P waves than QRS complexes

4. PR interval
   - Normal (≤0.20 seconds)
   - Short (<0.08 seconds)
   - Lengthened (>0.20 seconds)

5. QRS complex duration
   - Normal (≤0.12 seconds)
   - Wide (>0.12 seconds)

6. QRS complex direction lead V1
   - Negative and ≤0.12 seconds (normal)
   - QRS duration >0.12 seconds (right or left bundle branch block pattern not present)

7. ST segments
   - Normal
   - Elevated (≥2 mm)
   - Depressed (≥2 mm)

8. T Wave
   - Normal
   - Inverted

9. QTc
   - Normal
   - Lengthened (>0.47 seconds)
Interpretation: Normal sinus rhythm with a first-degree and second-degree atrioventricular (AV) block type II (Mobitz II).

Rationale
Atroventricular block occurs when there is intermittent or sudden loss of conduction from the atria to the ventricles. Degree is a term used to describe the severity of the AV block, with the least severe being a delay in atrial conduction (first degree), moderate severity occurs when some atrial impulses are blocked (second degree), and the most severe form when no atrial impulses are conducted (third degree). This patient has both a first-degree AV block (PR interval >0.30 seconds) with every sinus beat, and a second-degree type II AV block, occurring after the second, third, fourth, and fifth conducted beats. Diagnostic features of type II AV block include constant PR interval, non–conducted P waves, and often a wide QRS complex indicating a delay or block in 1 of the bundle branches. The blocked beat is the result of an intermittent block of the other bundle branch. Because the site of the block is at the most distal part of the conduction system, an escape rhythm may not occur, which may result in syncope, cardiac arrest, or sudden death. Causes include acute anteroseptal MI and age-related degeneration of the conduction system; the latter is most likely the cause of this rhythm since there is no evidence of acute MI.

Nursing Actions
Because of this patient’s symptoms, careful monitoring of the heart rhythm for complete AV block or asystole is essential. Temporary transcutaneous pacing equipment should be available, with the possibility of permanent pacemaker placement.
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