A pale young man feeling weak, nauseous and faint: how to manage?

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A 32-year-old man walks into your general practice physically supported by his sister. He looks pale and unwell and feels very weak, nauseated and faint. He says he normally has good health but hasn't been well since waking this morning.

How should your secretary manage this situation?

Answer: The secretary should help the man sit or lie down in the waiting room and immediately contact you to let you know he is unwell.

How should you now manage the situation?

Answer: Excuse yourself from any patient you are with and immediately see the patient in the waiting room. You need to assess quickly whether an ambulance should be called and whether the patient is well enough to move to another area of the practice.

The patient's pulse rate is 30 beats per minute and regular, his blood pressure is 90/50 mmHg lying back in the chair and he is conscious and alert. He has no chest pain or shortness of breath and is not obviously cyanotic. What should you do next?

Answer: Ask the secretary to call for an ambulance: she should ring triple zero or the ambulance service directly, as per practice protocol. She should then explain to the patient you were with that you have an unexpected emergency and ask whether he or she would like to come back in an hour or reschedule the appointment.

The man is stable enough to move and would prefer to be somewhere more private so you move him in a wheelchair to a consulting room. What do you do after this?

Answer: You lie him flat or slightly head down on a bed, take his oxygen saturation (it is 96%), give him oxygen, take a brief history and examine his abdomen and respiratory and cardiovascular systems. In particular, you would be interested in the position of the apex (cardiomyopathy, heart failure, severe valve disease), the jugulovenous pressure (cannon waves are typical of third-degree heart block and are large, intermittent surges in the wave form; consistently raised jugulovenous pressure suggests right-sided heart failure), the presence of murmurs, his peripheral perfusion and respiration rate, and whether there are crepitations at the lung bases (suggesting heart failure). He tells you he is taking sotalol 80 mg tds for atrial fibrillation.

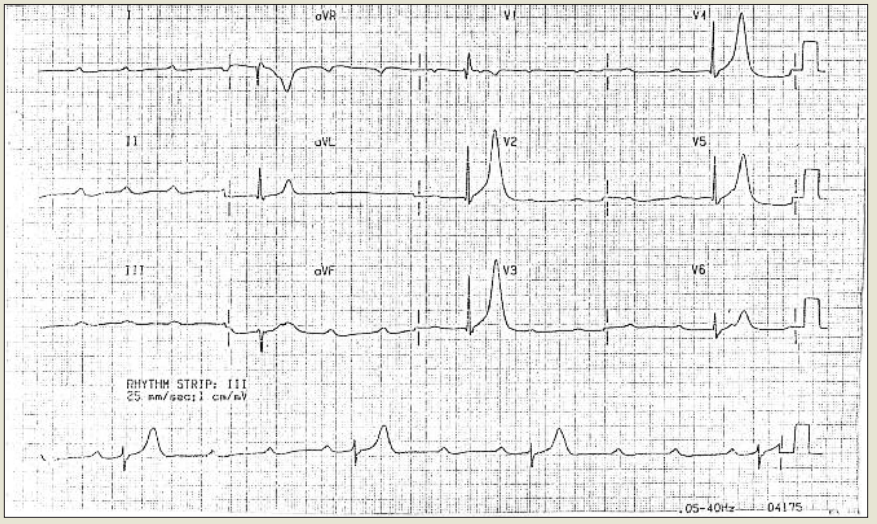

Figure. The patient's ECG.

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Recheck his blood pressure and pulse rate (it is important to take the pulse for at least 30 seconds), and insert an intravenous cannula.

The patient's blood pressure and pulse rate have not changed since you took them earlier.

His ECG is shown on the previous page. What is the diagnosis based on his ECG?

Answer: The ECG shows a variable (3:1 and 4:1) atrioventricular (AV) block. The rate is 20 beats per minute and regular. There is left axis deviation and tall peaked T-waves in leads V2, V3, V4 and V5. Tall peaked T-waves are common and physiological in young people; however, in this case it could be pathological as they are very pronounced. The QT interval is about 600 ms. The QTc is in the normal range but there is still a risk of torsades de pointes with this absolute QT interval and marked bradycardia. Sotalol can cause or exacerbate AV block and can prolong the QT interval.

As the patient has had atrial fibrillation in the past there may also be some sinus node dysfunction (sick sinus syndrome). However, the sinus rate on this ECG is in the normal range.

Based on the ECG findings in this patient, what is the differential diagnosis?

Answer: The differential diagnosis would be third-degree AV block ('complete heart block'). This is caused by conduction abnormalities in the AV node or the His-Purkinje system. When there is third-degree AV block, a slow escape rhythm may originate from a more distal site in the His-Purkinje system or ventricles. The more distal the origin of the escape rhythm, the slower this ventricular rhythm and the wider the QRS duration.

In this patient's ECG, every third or fourth atrial beat is conducted through the His-Purkinje system to the ventricles, resulting in a particularly slow heart rate that could be confused with complete heart block. With complete AV block the ventricular rhythm is typically regular and there is no association between it and the P-waves. Here, however, the ventricular rhythm is irregular at times (as the block varies between 3:1 and 4:1), and the PR interval is fairly constant, indicating association (the exception being that there is a very slight reduction of length of the PR duration when the block changes to 3:1 from 4:1). So this is not third-degree AV block, but it could certainly be called 'high grade' second-degree block. With such a slow ventricular rate, the acute management is the same as for acquired third-degree block.

The young man's sister says she brought him to see you because he blacked out for a few moments when he was sitting at the breakfast table telling her how unwell he felt. Fortunately he fell forward into his cereal rather than off the chair. How do you explain the blackout to them?

Answer: This faint was most likely due to a 'Stokes-Adams attack' (cardiac syncope due to a profound bradycardia) or perhaps non-sustained torsades de pointes, rather than any other cause (such as left ventricular outflow obstruction due to valve disease or cardiomyopathy, Brugada syndrome or Wolff-Parkinson-White syndrome).

What would you do if this patient were to lose consciousness again right now?

Answer: Lie the patient flatter, with feet elevated (Trendelenburg position). Without leaving the patient, arrange for triple zero or the ambulance service to be called again. If another doctor or a nurse is at the practice, they should be called to assist.

Oxygen should be continued. Cardiopulmonary resuscitation should be commenced if the patient is in cardiac arrest. If the practice has a defibrillator, you can get a rhythm strip from this. If there is torsades/ventricular tachycardia or ventricular fibrillation, defibrillation should be performed immediately, but this will not work if there is asystole or bradycardia.

For asystolic arrest (or profound bradycardia with cardiorespiratory arrest), adrenaline 1:1000 0.1 mL/mg IV and atropine 1200 µg IV should be used. These may be repeated if there is an unsatisfactory response.

If the patient is not in full arrest (he has respiration and a pulse) but remains bradycardic and hypotensive, adrenaline should be withheld but atropine 600 µg should be tried.

Isoprenaline should not be used in addition to adrenaline because they are both cardiac stimulants. Also, as the patient is taking sotalol, the effect of isoprenaline (a beta-agonist) would be inhibited.

Because the patient is taking the beta blocker sotalol, glucagon may be used. Glucagon is a positive inotrope and increases the heart rate via increased AV conduction; it is used for beta blocker and calcium channel blocker overdose.

What can cause atrioventricular block?

Answer: Causes of acquired AV block include medications such as beta blockers, calcium antagonists and digitalis, a severe hyperkalaemia, myocardial ischaemia, Lyme disease, carotid sinus massage bilaterally simultaneously, fibrotic degeneration of the Bundle of His, severe myocardial disease such as cardiomyopathy and heart failure, and severe hypothermia. Congenital AV block is associated with some congenital heart disease and with maternal systemic lupus erythematosus.

Sotalol is renally excreted so can accumulate to toxic levels if there is renal dysfunction. In this man's case, sotalol is a likely contributing factor.

What management do you expect this patient might need in hospital?

Answer: This patient will initially require temporary pacing if this arrhythmia continues. Sotalol would be ceased. Investigations indicated would include cardiac monitoring, chest x-ray, blood tests (electrolytes, urea and creatinine [EUC], calcium, magnesium, blood glucose, cardiac enzymes, full blood count, thyroid-stimulating hormone [TSH], antinuclear antibody [ANA], C-reactive protein [CRP] and, if available, determination of sotalol levels) and echocardiography.

Depending on the results of these investigations, electrophysiology studies and a permanent pacemaker are likely to be necessary. **CT**