Syncope in a teenage girl

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GP Emergency Management articles use real cases to illustrate the emergency management of patients presenting in general practice with cardiac problems.

Your secretary tells you a 15-year-old girl well known to you is feeling faint. She is now lying down in the treatment room with her mother present. Her mother is very concerned because this is the third time in two years the girl has fainted (or almost fainted on this occasion). She would like you to examine the girl during the 'attack'.

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You are with a patient. Do you excuse yourself from your current patient to examine the girl?

Answer: Yes, it is wise for several reasons to examine the patient immediately. The mother is correct in thinking that you may uncover an abnormality during the episode of faintness, which may lead to a diagnosis that may not be evident at other times. The causes of syncope range from benign to life-threatening, so observation or monitoring during symptoms can be invaluable. It is also wise to review the patient at once because she and her mother will understandably think you cannot be bothered if you do not review the girl during what they feel is an emergency.

The girl looks pale and tired. Her pulse is 50 beats per minute and irregularly irregular over a minute. There are no cardiac murmurs, the apex is normal and her jugulovenous pressure at 45° is not raised. Her respiration is normal, her blood pressure is 90/50 mmHg and she is alert and orientated. Her capillary blood glucose level is 3.8 mmol/L. She tells you she was walking to school early this morning and felt faint and sat down on the pavement. On the other two occasions she actually did faint and she remembered being told to sit down if it happened again. She felt a bit nauseated and recovered after a few minutes. However, she was sent home from school two hours later because she still felt faint and lightheaded and still a bit nauseated. Her mother bought the girl to the surgery as soon as she got home.

What do you do next?

Answer: Arrange an ECG while the patient's pulse rate abnormality is still present.

What else would you like to ask the patient?

Answer: Can she think of anything that might be causing the faintness? Did she have anything to eat or drink this morning before leaving home? Has she had anything since? Was she aware of any change in her heartbeat or breathing? Did she have any abdominal pain, headache or vision disturbance, or was she aware of any strange smell or sensation when she felt faint? On the previous occasions when she fainted, was there any tongue-biting, incontinence, confusion or disorientation lasting more than a couple of minutes? When was her last menstrual period? Is she taking any medications? Does she have any known medical problems? Is there a family history of loss of consciousness or fainting or problems with heart rates or sudden death? Can she describe what happened on the other two occasions when she did faint?

You should also ask her mother to step out for a minute so you can ask the girl some personal questions. These questions could include could she possibly be pregnant and has she used any recreational drugs.

The girl tells you she currently has her period but does not have any stomach pain. She did not notice any disturbance to her heartbeat or breathing, or any strange feelings or smells. She feels more faint when she sits up or stands. She has no medical problems and is taking no medications. You ask her if she is feeling better than when she was walking to school and she says 'Yes, a bit.' She has had no breakfast but did have a glass of water. She is vegetarian and her mother says she does not take the iron tablets you prescribed previously when she was diagnosed with iron-deficiency anaemia. The other occasions of fainting were also in the morning, once after school sport and once during school lessons when she got up to change seats.

You take an ECG (Figure). What does it show?

Answer: Sinus bradycardia with sinus arrhythmia. Normal QRS complexes and normal QT intervals.

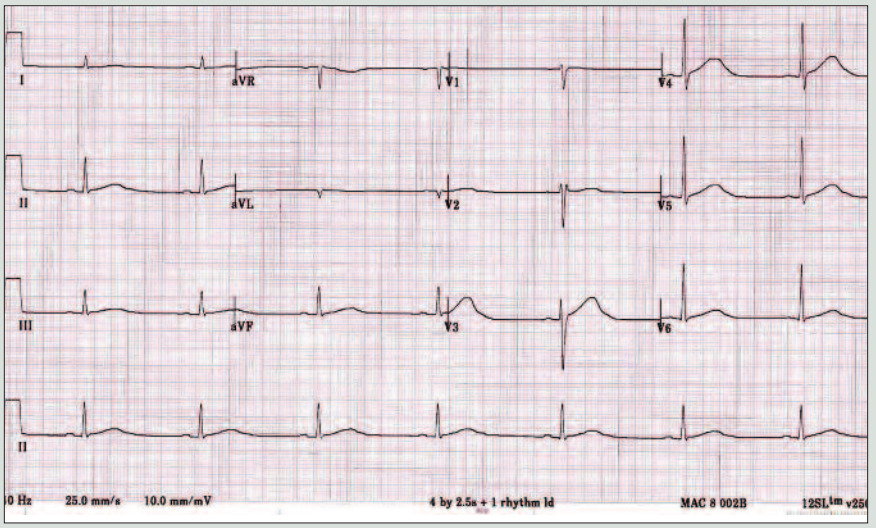

Figure. ECG showing sinus bradycardia with sinus arrhythmia, otherwise normal.

What is the most likely diagnosis for this presentation?

Answer: Presyncope from hypoglycaemia and nonpathological mild hypotension and bradycardia.

Is a cardiac cause for the presyncope likely?

Answer: It is common for healthy young people to have mild bradycardia, especially when lying quietly. It is more common in those who do a lot of sport and are very fit, in which case a high vagal tone is likely to be the cause.

Borderline hypotension, as in this case, is also common in young people and there is often a hereditary element present. The patient may be symptomatic, especially if the weather is hot (due to worsening of the hypotension from vasodilation) and when the patient is dehydrated. More salt in the diet is advisable because salt will retain fluid in the intravascular space, raising the blood pressure and reducing postural hypotension.

The patient's prolonged mild hypotension, bradycardia and unwell feeling are likely to be associated with high vagal nerve tone from hypoglycaemia in this case. Some people are more sensitive to vagal nerve stimulation and so tend to faint more easily with its common precipitants of pain, fear or hypoglycaemia. The vagal nerve stimulation temporarily produces bradycardia (this may be quite pronounced – for example, as little as 30 beats per minute) and hypotension. The haemodynamic change may be severe enough to cause syncope followed by short convulsions; however, this is not epilepsy.

It is unlikely that the patient in this case has an episode of sinus arrest, one of the various types of heart block or an arrhythmia given the fact that her ECG was normal when taken during symptoms of faintness. Also, her past history supports a diagnosis of ordinary syncope from similar precipitants. For similar reasons and because of her age, a pulmonary embolus is also most unlikely.

What active management of this situation is advisable?

Answer: Offer the patient something to eat and drink, ideally something with readily absorbed sugar such as some fruit juice or sweetened milk, followed by a sandwich and a glass of water. If the diagnosis of hypoglycaemia is correct she should feel less nauseated and less faint.

Recheck the patient's capillary blood glucose level 15 minutes after she has drunk the sweetened drink.

The patient feels better with your treatment and is well enough after 15 minutes to go home. Her blood pressure and pulse stay much the same. What further investigations or management would you suggest?

Answer: The patient should take the iron tablets daily on an empty stomach with fresh fruit juice or fruit to prevent nausea, not with a meal, and have her iron studies and full blood count repeated in four months. The patient should be prescribed 2 to 6 mg/kg/day of elemental iron to treat her iron deficiency. If the dose is appropriate, her stools should turn black and she may have some slight looseness or constipation. If she has problems tolerating the iron, she should discuss other options with you.

The patient should eat something containing carbohydrate for breakfast and drink about 200 mL of water when she gets up, or two glasses if she is thirsty or it is a very hot day.

Given the patient's normal cardiac examination and ECG and her absence of a family history of cardiac disease, it is unnecessary to refer this patient to a cardiologist or to perform a cardiac echocardiogram unless the patient and her mother are not able to be reassured.

Outcome

The ECG is formally reported as 'sinus bradycardia with sinus arrhythmia, otherwise normal'. The patient has remained well and you have placed a reminder in her notes for iron studies in four months' time. **CT**

Key points

- **Arrange an ECG quickly for patients who present because of pulse abnormalities while the problem is still present.**
- **Hypoglycaemia, dehydration, iron deficiency and high vagal tone are all common problems that added together can increase the risk of presyncope or syncope.**
- **Healthy young people and very fit people often have mild bradycardia at rest.**
- **Borderline hypotension is also common in young people and may respond to an increase in salt in the diet as well as increased fluids.**
- **Iron tablets are commonly taken at inadequate doses and for inadequate lengths of time by patients who are iron deficient.**