Case histories - Cardiac syncope

- Drug induced bradycardia
- Hypertrophic obstructive cardiomyopathy
- Long QT syndrome
- Myocardial Ischaemia
- Pulmonary Embolism
- Aortic Stenosis
- Atrial fibrillation
- Brugada syndrome

Drug induced bradycardia

History

A 73 year old gentleman presents to you following three episodes of syncope within one week. He has type 2 diabetes mellitus and glaucoma. His medications include insulin, alfuzosin and he recently commenced timolol eye drops. His wife, who witnessed these episodes, reports that the episodes begin with him complaining of feeling dizzy whilst he was seated, and then losing consciousness. There is no associated seizure activity, tongue biting or incontinence, and blood sugar testing during these episodes does not show hypoglycaemia.

Examination

Cardiovascular and neurological examination is normal with no postural drop between lying and standing blood pressures.

Which investigations should be performed in primary care?

An ECG is key to identify any possible arrhythmia responsible for his symptoms. This shows sinus rhythm at a rate of 54 bpm and is otherwise normal.

What would you do next?

This patient has a clear history of recurrent syncopal episodes and requires further investigation. The next most useful investigation would be a 48-hour Holter monitor and dependent on local services may be directly accessed in primary care or require referral to cardiology. You should advise him that he must not drive and must notify the DVLA.

Outcome

A 48-hour Holter monitor shows sinus rhythm at a rate of 60 bpm with frequent episodes of sinus bradycardia as low as 43 bpm; during the bradycardic episodes the patient reported dizziness. You diagnose him with symptomatic bradycardia secondary to the use of timolol eye drops. His eye drops are stopped, and an alternative is used after advice from ophthalmology. He has no further episodes of syncope and you can now advise him that he can return to driving after 4 weeks.

Learning points

- Timolol is frequently used as a treatment for glaucoma and although it is administered topically, it can spread systemically with no hepatic first pass effect.
- It can be associated with bradycardia and hypotension in older patients and should be used with caution.
- A drug may unmask underlying cardiac pathology that can recur or persist in the future after the offending drug has been stopped.
- 24 Holter monitoring should be considered in patients who have frequent (ideally daily) episodes.

Hypertrophic obstructive cardiomyopathy

History

A 45 year old HGV driver presents to you after 2 episodes of syncope without any preceding warning and triggers. He has a past medical history of type 2 diabetes mellitus and is taking metformin.

Examination

Cardiovascular examination reveals a loud systolic murmur.

Which investigations should be performed in primary care?

An ECG should be performed and shows normal sinus rhythm with signs of left ventricular hypertrophy.

What would you do next?

He should be advised to stop driving immediately and notify the DVLA. With this history and examination findings he requires urgent referral to a cardiologist for further investigations.

Outcome

The cardiologist organises an echocardiogram which shows evidence of hypertrophic cardiomyopathy.

He undergoes further testing including Holter monitoring and tilt table testing, both of which are normal. He has an insertable cardiac monitor fitted, which shows paroxysmal atrioventricular block with a long asystolic pause associated with syncope. He is treated with a pacemaker and subsequently remains asymptomatic.

Learning points

- Syncope can be the presenting symptom of hypertrophic cardiomyopathy, often carrying a poor prognosis, and the complex relationship between haemodynamic, arrhythmic and ischaemic causes can make diagnosing the underlying cause of syncope difficult
- Brief self-terminating ventricular tachyarrhythmias, namely ventricular tachycardia and fibrillation, may also induce syncope in patients with HCM
- The presence of a new systolic murmur in a patient with syncope mandates further assessment by a cardiologist
- Screening of first-degree relatives is recommended
- GP's need to be aware of the DVLA guidance regarding syncope and driving and need to communicate this to patients and record the advice given.

Long QT syndrome

History

A 22 year old lady consults with you after a syncopal episode 2 days previously, whilst walking alone. She did not recall any preceding symptoms of chest pain, breathlessness or palpitations. She has no significant past medical history but did recall one previous syncopal episode 4 years previously, which she attributed to a simple faint and which was not investigated further at the time. She reports that her brother has previously experienced syncopal episodes.

Examination

Cardiovascular examination is normal.

Which investigations should be performed in primary care?

An ECG should be performed, which showed a prolonged QT interval of 600ms.

What would you do next?

The diagnosis is likely to be congenital long QT syndrome (LQTS) and she should be referred immediately to a cardiologist for further management. You should advise her not to drive pending further assessment and advice from her cardiologist.

Learning points

- Patients with long QT syndrome may present to their GP after syncopal episodes and ECG is key in reaching the diagnosis
- A good family history is important – ask about both diagnosed long QT syndrome, and any adults who have died suddenly with no known cause
- There are many types of LQTS. Classification by a cardiologist may point towards different treatments
- It can present at any stage in life and there may be long periods between symptomatic episodes
- Syncope is caused by ventricular tachycardia (torsades de points) or fibrillation
- Management consists of avoiding drugs that prolong the QT interval, treatment with beta blockers, and consideration of an implantable cardioverter/defibrillator (ICD) for high risk patients
- Diagnosis should prompt screening of potentially affected family members.

Myocardial ischaemia case history

History

A 46 year old male requests an urgent appointment with you after experiencing a syncopal episode the same morning. He recalls feeling generally unwell and dizzy whilst driving and on exiting his car he lost consciousness. This episode was unwitnessed and the patient is unsure how long his loss of consciousness lasted. On further questioning he reported intermittent epigastric discomfort over the previous two weeks. He is a smoker, has no other significant medical history and is not taking any medication.

Examination

He appears pale but otherwise the physical examination was normal.

Which investigations should be performed in primary care?

An ECG performed in the surgery is normal.

What would you do next?

The features in this case raise the possibility of vasovagal syncope. However, the patient reports feeling generally unwell and you refer him to the hospital medical team for further assessment.

Outcome

Further investigations in hospital, including blood tests, are normal. In view of his recent epigastric discomfort, he undergoes a treadmill test which shows ST depression in the first stage of the Bruce Protocol. Subsequent coronary angiography reveals complete occlusion of his left main coronary artery. He is referred to the cardiothoracic surgeons for coronary artery bypass grafting. At his 3 month follow up outpatient appointment, he has had no further symptoms. As he had syncope whilst sitting, with no avoidable trigger, he informed the DVLA at the start of the investigation process, and they advised him when he was safe to return to driving.

Learning points

- Syncope is a rare but recognised presentation of myocardial ischaemia
- It is important to enquire about the symptoms of myocardial ischaemia during the evaluation of syncope to prompt appropriate further investigations and management. In this case, the epigastric discomfort was probably cardiac in origin.
- Routine exercise testing is not recommended for the evaluation of syncope but should be considered in patients with risk factors for coronary artery disease and exercise induced syncope.

Pulmonary Embolism

History

You are asked to visit a 76 year old lady in a residential home after the staff witness an episode of syncope that morning. Over the past 24 hours she had reported feeling intermittently dizzy. Staff report that she appeared clammy prior to her syncopal episode. She has a past medical history of breast cancer treated with mastectomy and chemotherapy five years previously. Three years ago, she had suffered a DVT and had been treated with six months of anticoagulation. She also has hypertension and hyperlipidaemia, and her medications include amlodipine, atorvastatin and a calcium/vitamin D supplement.

Examination

Physical examination reveals sinus tachycardia of 108 bpm and blood pressure of 156/96. Cardiovascular and respiratory examination are normal.

What would you do next?

The history and the finding of sinus tachycardia raise the possibility of an acute medical problem and she should be referred to the hospital medical team for further assessment.

Outcome

She undergoes further blood tests in hospital including a d-dimer test which is raised. ECG shows sinus tachycardia at 106 bpm and right bundle branch block with an $S_1Q_3T_3$ pattern. She has a CTPA which reveals bilateral pulmonary emboli and she is treated successfully with thrombolysis.

Learning Points

- Pulmonary embolism can present with non-specific signs and symptoms including syncope
- PE has been reported as the cause of syncope in 0.8% - 1.3% of patients admitted to hospital
- The presence of syncope in patients with pulmonary embolism is a poor prognostic sign as it suggests massive PE with an associated mortality of approximately 30%.

Aortic Stenosis

History

You are reviewing a 62 year old lady for a cough and find a new systolic murmur. She takes ramipril for her blood pressure and is otherwise well.

Examination

Apart from the murmur, cardiovascular examination is normal and her blood pressure is well controlled at 136/78 mmHg.

What would you do next?

She requires an echocardiogram to investigate her murmur further, which demonstrates severe aortic stenosis. She is reviewed by cardiology and has regular follow up planned.

Outcome

Four months later she consults with you after suffering a syncopal episode with no warning whilst walking. You refer her urgently back to her cardiologist. She undergoes aortic valve replacement and remains symptom free following surgery.

Learning Points

- Syncope, breathlessness and angina are all symptoms of severe aortic stenosis and the average survival rate after onset of these symptoms is three years
- Early intervention should be considered in aortic stenosis, to protect the left ventricle.
- Syncope, breathlessness or anginal chest pain in patients with known aortic stenosis should prompt urgent referral to a cardiologist for consideration of surgical valve replacement or transcatheter aortic valve implantation (TAVI) to prevent symptoms and improve prognosis and survival.

Atrial Fibrillation

History

A 36 year old nurse presents to you with episodes of dizziness, palpitations and breathlessness lasting several minutes. She has no significant past medical history and does not take any medications She develops syncope during half of these episodes. There are no precipitating factors and the episodes resolve spontaneously. When she develops syncope, she recovers rapidly.

Examination

Cardiovascular examination and postural blood pressures are normal.

What would you do next?

You should advise her not to drive and notify the DVLA. She should have an ECG (which is normal), blood tests including thyroid function testing and be referred to a cardiologist to investigate her palpitations and syncope further.

Outcome

Whilst awaiting her cardiology appointment she continues to have episodes and on one occasion attends the emergency department, where her ECG reveals normal sinus rhythm again. The emergency department team organise a Holter monitor for 24 hours and there are no reported episodes during this period and no abnormal ECG changes.

She consults with a medical colleague who considers a diagnosis of anxiety with panic attacks, and she engages with psychological therapy to manage anxiety but continues to experience symptoms.

She is reviewed by a cardiologist and an insertable cardiac monitor (ICM) is implanted. 3 months later she has another episode and the ICM demonstrates atrial fibrillation with a rapid ventricular response. She undergoes successful ablation therapy, and has no further episodes.

Learning Points

- Paroxysmal atrial fibrillation is a relatively uncommon cause of syncope.
- Short term monitoring of infrequent episodes of pre syncope or syncope (e.g. 24 hour ECG/Holter monitor) has a low yield.
- Implantable devices, although more expensive, should be considered with infrequent episodes to improve the diagnostic yield and may be cost effective.

Brugada Syndrome

History

A 24 year old man of South-East Asian origin, presents to you after experiencing 3 episodes of syncope over two 2 months. He reports loss of consciousness for a few seconds before rapid recovery. These episodes are not associated with precipitating factors and there are no other associated symptoms. He has no significant personal past medical history. However, his father died unexpectedly age 32 in a drowning accident whilst snorkelling on holiday.

Examination

Cardiovascular examination and postural blood pressures are normal.

What would you do next?

You should advise him not to drive and notify the DVLA. He should have an ECG, which shows sinus rhythm and atypical right bundle branch block, and you refer him urgently to a cardiologist for further assessment.

Outcome

His cardiologist recognises the ECG pattern as type 1 Brugada Syndrome. An echocardiogram is normal. An implantable cardioverter defibrillator is inserted, and no further episodes of syncope occur. His family are screened for Brugada Syndrome.

Learning Points

- Brugada syndrome, a genetically determined channelopathy, can cause syncopal episodes or sudden death due to ventricular tachyarrhythmias in patients with a structurally normal heart
- ECGs can show changes that resemble right bundle branch block with coved ST elevation in leads V1 - V3 (Type 1 Brugada)
- In some patients with Brugada Syndrome the ECG can be normal and for diagnostic purposes, abnormalities can be induced in the laboratory by infusion of anti-arrhythmic agents
- As Brugada Syndrome is inherited, enquiries should be made regarding family history. First degree relatives should be screened
- There is no effective drug therapy for Brugada Syndrome and implantable cardioverter defibrillators (ICDs) are indicated in some patients to prevent sudden death
- Unexplained drowning may be a manifestation of sudden cardiac death.