Case Study

40 YEAR OLD MALE WITH SYNCOPE

This case study aims to
- Help understand the various causes of syncope
- Help differentiate syncope from vertigo, seizures and TIA
- Discuss the approach to a patient presenting with syncope

Case

40-year-old male has come to his family physician for complaints of 2 episodes of transient loss of consciousness lasting for a few seconds. These spells were associated with increased sweating. There was no report of seizure activity. He denied recent illness, chest pain, palpitations, head trauma, or seizure activity. He was physically active. There was no family history of heart disease or sudden cardiac death. He took no medications.

Physical examination revealed a normal-appearing male with a medium build. The pulse rate was 50/min, irregular. The blood pressure was 110/70 mm Hg. Heart sounds were normal, specifically no murmurs were auscultated. Neurological examination was normal.

The 12-lead electrocardiogram is given below:

1. Based on the history, clinical examination and ECG, what is the diagnosis?
   Patient has episodes of syncope, in the ECG; P waves show no relation to the QRS complexes. The ventricles are depolarised by a ventricular escape rhythm suggestive of complete heart block.

2. What are the common causes of syncope?
   Syncope is the sudden and transient loss of consciousness and postural tone attributable to inadequate cerebral blood flow, specifically to the brainstem's reticular activating system. The causes of syncope are:

   1. Non-cardiac causes

<table>
<thead>
<tr>
<th>Neurologic</th>
<th>Vertebrobasilar TIAs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subclavian Steal Syndrome</td>
</tr>
</tbody>
</table>
Normal Pressure Hydrocephalus
Seizure Disorder

Metabolic
Hypoxia
Hyperventilation
Hypoglycemia

Vasomotor
Orthostatic Hypotension
Vasovagal Syncope

2. Cardiac causes

<table>
<thead>
<tr>
<th>Structural</th>
<th>Dysrhythmia</th>
<th>Tachycardia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradiardia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aortic stenosis</td>
<td>Sick sinus syndrome</td>
<td>Ventricular tachycardia (VT)</td>
</tr>
<tr>
<td>Hypertrophic cardiomyopathy</td>
<td>Atrioventricular (AV) block</td>
<td>Ventricular fibrillation</td>
</tr>
<tr>
<td>Pulmonary embolus</td>
<td>Drug-induced</td>
<td>Torsade de pointes VT</td>
</tr>
<tr>
<td>Pulmonary hypertension</td>
<td>Drug-induced</td>
<td>Supraventricular tachycardia</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>Drug-induced</td>
<td>Atrial fibrillation/flutter</td>
</tr>
<tr>
<td>Tamponade</td>
<td>Drug-induced</td>
<td></td>
</tr>
<tr>
<td>Aortic dissection</td>
<td>Drug-induced</td>
<td></td>
</tr>
</tbody>
</table>

3. Clinically, how would you differentiate between the various causes of syncope?
- Postural orthostatic syncope is an autonomic neuropathy that results in orthostatic intolerance from insufficient peripheral vasoconstriction while standing. Patients with postural orthostatic tachycardia typically present with symptoms of orthostasis and palpitations.
- Syncope from stress or psychological disorder (conversion disorder with psychosomatic response) is generally a diagnosis of exclusion.
- Neurocardiogenic syncope is frequently accompanied by a prodrome of nausea, diaphoresis, and lightheadedness.
- Tachyarrhythmias may present as palpitations.

3. How will you differentiate between syncope and seizures, vertigo?
- Vertigo is a sensation of movement of the patient and/or the surroundings; vertigo is usually caused by a neurologic or ENT problem. Most commonly, the abnormality is in the inner ear.
- Seizure: Partial complex seizures may cause loss of consciousness without marked motor activity. Grand mal seizures are characterized by tonic-clonic motor activity. On the other hand, syncope can be accompanied by tonic posturing due to brainstem hypoxia. Syncope is rarely accompanied by incontinence or a prolonged period of confusion following the event (i.e., postictal confusion).

4. What are the investigations to be done in a patient with syncope?

Step 1: A thorough history and physical examination.
The history and physical examination give vital clues in diagnosing nearly all causes of syncope.

**Step 2: Directed tests or studies**

After the history and physical examination:

- If neurological cause is suspected, a brain scan or EEG, or in some cases, angiography to confirm the diagnosis.
- If vasodepressor syncope is suspected, a **tilt table study** may be useful in confirming the diagnosis.
- If cardiac cause is suspected, a non-invasive cardiac workup is done immediately. In most cases, this work-up will consist of an echocardiogram, Holter monitoring.

**Step 3: If the cause of syncope remains unknown after Step 2**

- If underlying heart disease was discovered in Step 2, patient is referred for a full cardiac evaluation.
- If no underlying heart disease is apparent after Step 2, Holter monitoring, tilt table testing, and possibly stress testing if not performed during Step 2. May be considered.

**Case contd.**

*Patient underwent implantation of permanent pacemaker and had an uneventful recovery*

**Take home points**

- Syncope is the sudden and transient loss of consciousness and postural tone attributable to inadequate cerebral blood flow.
- Syncope can be due to cardiac, neurological, metabolic and vasomotor causes.
- The history and physical examination give vital clues in diagnosing nearly all causes of syncope.
- Based on history and clinical examination, further tests are done to confirm the diagnosis.

**References**