Investigating cardiac syncope

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INTRODUCTION

Syncope is a common condition affecting up to 50% of the population[1], being the 15th most common presentation to Emergency Departments and the 5th leading reason for hospital admission.[2]

There are a number of different causes of syncope, generally being divided into neurally-mediated, orthostatic, cardiac, neurological or psychiatric. The annual mortality is between 18% - 32% if the cause is cardiac.[3] Other causes are more benign with mortality between 0% -15%.

The diagnosis of syncope can be made by clinical methods including ECG in up to 50% of patients. In the remaining patients other investigations are required, but until recently, despite extensive investigation, up to 30% of patients could not receive a definitive diagnosis.

The advent of "Syncope Clinics" such as the San Heart - Blackouts and Faints Clinic and new implantable monitors have improved the diagnostic yield up to 91.6% in recently published data.[4]

CARDIAC SYNCOPE INVESTIGATIONS

History and Physical Examination are the basis of syncope investigation. The salient points are provocating factors, prodrome and associated features especially chest pain or palpitations when trying to establish a cardiac cause. Also, corroborating history from bystanders or first responders can be helpful.

ECG is important for demonstration of abnormalities that would suggest an arrhythmic cause. The important abnormalities that may be present would include conduction problems especially trifascicular block, delta waves and short PR interval of Wolff-Parkinson-White, Short or long QT and Brugada ECG pattern.

Echocardiography is important for demonstrating left ventricular (LV) ejection fraction, with a reduced LV ejection fraction of less than 40% being associated with a significant risk of malignant ventricular arrhythmias. It will show structural problems, such as Hypertrophic Cardiomyopathy and severe Aortic Stenosis, both possible causes of cardiac syncope.

Cardiac MRI is able to assess cardiac structure and function; however it is uniquely suited to assessing tissue characterisation. It can reliably detect scar and inflammation, both of which are important determinants of the risk of ventricular arrhythmias both in ischaemic and non-ischaemic cardiomyopathy and myocarditis.

Tilt Table Testing is helpful in diagnosing neurally mediated syncope, particularly those who do not have the typical prodrome with their episodes. It is limited by a low sensitivity but does have a high specificity.

Cardiac Monitoring can be divided into short term and prolonged monitoring. Short term covers monitoring usually in the range of four to seventy-two hours. It can either be as a monitored hospital inpatient on continuous telemetry monitoring or ambulatory monitoring, usually as an outpatient with Holter monitors.

Long term monitoring covers both external monitors such as event monitors that patients have for 1-4 weeks, and implanted loop recorders that provide continuous monitoring for approximately 3 years.

These devices are small cardiac monitors that are placed subcutaneously in the left chest and automatically record if the heart rate goes outside preset limits or can be activated to record the rhythm by the patient at any time they have symptoms.

Implanted loop recorders (ILR) are indicated in infrequent syncope, where routine investigation has failed to demonstrate a cause, and in high risk syncope without a cause found and no indication for primary prevention implanted cardiac defibrillator or a pacemaker.

Loop recorders have been showed to increase diagnostic yield by approximately 35% compared to traditional strategies. ILR has been shown to be cost effective for the investigation of syncope.

Invasive Electrophysiology (EPS) is useful in patients with syncope with previous myocardial infarction or other scar related conditions where noninvasive investigation has not revealed a cause for syncope.

However, if the LV ejection fraction is less than 35% then the patient already has an indication for an implanted defibrillator and there is no proven benefit to EPS in this situation. However, it may be useful in these patients to help customise the programming of the defibrillator.

Wearables. The role of wearable devices is currently an area that is evolving. They potentially will have the ability to provide a significant amount of data that can help in the diagnosis of syncope. However, at this stage their clinical usefulness is unclear but as technology advances they may become a mainstay in investigation of syncope.

CONCLUSION

Syncope represents a common diagnostic challenge. Multidisciplinary Syncope Units utilising targeted investigations are improving diagnostic yield with reduction in patients requiring admission and resource utilisation.
New technologies, with the ability to monitor heart rhythm for prolonged periods, are increasingly utilised and increasing the diagnostic accuracy for significant cardiac arrhythmia. The next challenge will be to find effective treatments that reliably reduce recurrence rates and reduce morbidity and mortality.

Syncope Take Home Messages*

- Vasovagal syncope is probable if precipitated by fear, pain or standing and associated with typical progressive prodrome
- Situational syncope is probable if occurs during or immediately after specific triggers, such as seeing blood
- Arrhythmic syncope is probable with ECG showing
  - Sinus pauses >3 seconds when awake
  - Mobitz II second or third degree AV block
  - Ventricular tachycardia
  - Pacemaker malfunction
- Syncope due to structural cardiopulmonary disorders are probable in patients with atrial myxoma, atrial ball thrombus, severe aortic stenosis, pulmonary embolus or acute aortic dissection.

*(Adapted from European Cardiac Society Guidelines)

References available on request.

Upcoming GP Webinars

- **March 4th - Paediatrics**
- **March 30th - Cardiology**
- **May 26th - Cancer**
- **July 14th - Pain**
- **September 15th - Orthopaedics**
- **October 26th - Neurology**
- **November 24th - Gastroenterology**

Dates, topics, speaker and registration information available at www.sah.org.au/event-calendar