2024-01 Trial Exam

SAQ 17

You are looking after a 58 year old man who has an AICD. He has presented due to the device discharging 5 times during the previous 2 hours.

Whilst you are assessing him, he has another episode with a wide complex regular tachycardia on the monitor.

He is cardioverted successfully by his AICD.

You determine that he is in an electrical storm.

Notes: You are given the diagnosis. Electrical storm refers to multiple recurrences of ventricular arrhythmias over short period of time. (>3 episodes sustained VT or VF or appropriate shocks from AICD over 24/7) Most commonly it is VT, but can be Polymorphic VT or VF

a) Apart from myocardial ischaemia / infarction, state three (3) causes of structural heart disease that pre-dispose a patient to electrical storm.

Notes: The question excludes ischaemia- This is a mechanism frequently used in the exam for common/obvious answers or where an answer is part of a following sub-question and therefore would give a “free” mark. Don’t give answers like AMI

The question asks for “structural heart disease”. This implies scarring, and so answers such as myocarditis or thyrotoxicosis won’t score. Valvular heart disease is also not acceptable, but surgery to correct it would be (due to a scar).

Accepted answers:

Non-ischaemic cardiomyopathy

Arrhythmogenic right ventricular dysplasia

Sarcoidosis

Amyloidosis

Chagas disease

Post surgical resection

*I accepted any reasonable non-ischaemic cardiomyopathy. 1/2 mark if just said

“cardiomyopathy” No marks if said dilated cardiomyopathy as majority of this is ischaemic.

b) State 5 reversible causes of electrical storm in susceptible patients

* So has to be reversible and causing the storm. i.e. problems with the AICD do not answer the question and so don't score.

Accepted answers:

Drug toxicity- Class 1A anti-arrhythmics, amphetamines/ cocaine or other stimulants

Heart failure exacerbation

Acute myocardial ischaemia

Thyrotoxicosis

Electrolyte abnormality e.g. hypokalaemia, hypomagnesaemia

Infection/sepsis, fever

Alcohol excess

QT prolongation (inc drug toxicity)

Notes: Be careful giving too similar answers/ answers from the same categories. e.g. two anti-arrhythmics, or 2 drug causes of QT prolongation. Only one of these answers will score.

Be specific-“electrolyte abnormalities” will not score. Specific electrolyte abnormalities, or syntax such as “electrolyte abnormalities e.g. hypokalaemia” did score.

c) If the patient is stable, apart from treating the reversible cause, state two drugs with justification you would use to treat his electrical storm

Accepted answers:

Amiodarone- first line therapy for VT with class 1,2,3&4 action

Lidocaine- Class 1B anti-arryhthmic, esp useful in ischaemic VT

Beta blocker (give an example) - Decreased catechols that drive ES

Isoprenaline- acts on cardiac calcium channels to decrease VT, esp in setting of Brugada, short PR or long QT

Sedation e.g. propofol or benzos OR thoracic epidural. Decrease sympathetic drive to heart

Magnesium- Useful in case of TdP, long QTc

Notes: To get the point for justification you had to say a mechanism or a use case e.g. in torsades for Mg

Try not to give drugs from similar categories e.g amiodarone and lidocaine, unless you state you would use lidocaine if amiodarone failed.

Please don’t use procainamide in our exam. It is not available in Australia.

General hints

Read and answer the question

- Answer what's asked e.g. don't give answers like device malfunction when asked about reversible causes of electrical storm
- Don't give excluded answers e.g. don't give ischaemic causes when it says "Apart from ischaemia…"

Don't give similar answers/ same category answers.

- e.g. two tox causes, or two electrolyte abnormalities

General hints

Be specific

- e.g “electrolyte abnormality” vs “hypokalaemia”

Give only requested number of responses

- Only the first x answers will be marked and others will be ignored. Giving more answers wastes your time and won’t score even if correct

Show prioritisation- Give the most important, most life threatening/not to miss etc answer first.

Marks

- Cut mark- 7/12
  - A=1, b=3, c=3
- Range of marks 1-11
- Mean score 6.3, median score 7
- 19/34 scored ≥7

Reading

Dyer, S., Mogni, B. & Gottlieb, M.

Electrical storm: A focused review for the emergency physician.

Am J Emerg Medicine 38, 1481–1487 (2020).