SYNCOPE IN CHILDREN

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CASES

- 1. A 6 y/o boy with DLOC during blood sampling
- 2. A 7 y/o girl with DLOC during exercise
- 3. A 16 y/o boy with DLOC 30 minutes after exercise
- 4. A 10 y/o girl with DLOC during TV watching

Definitions

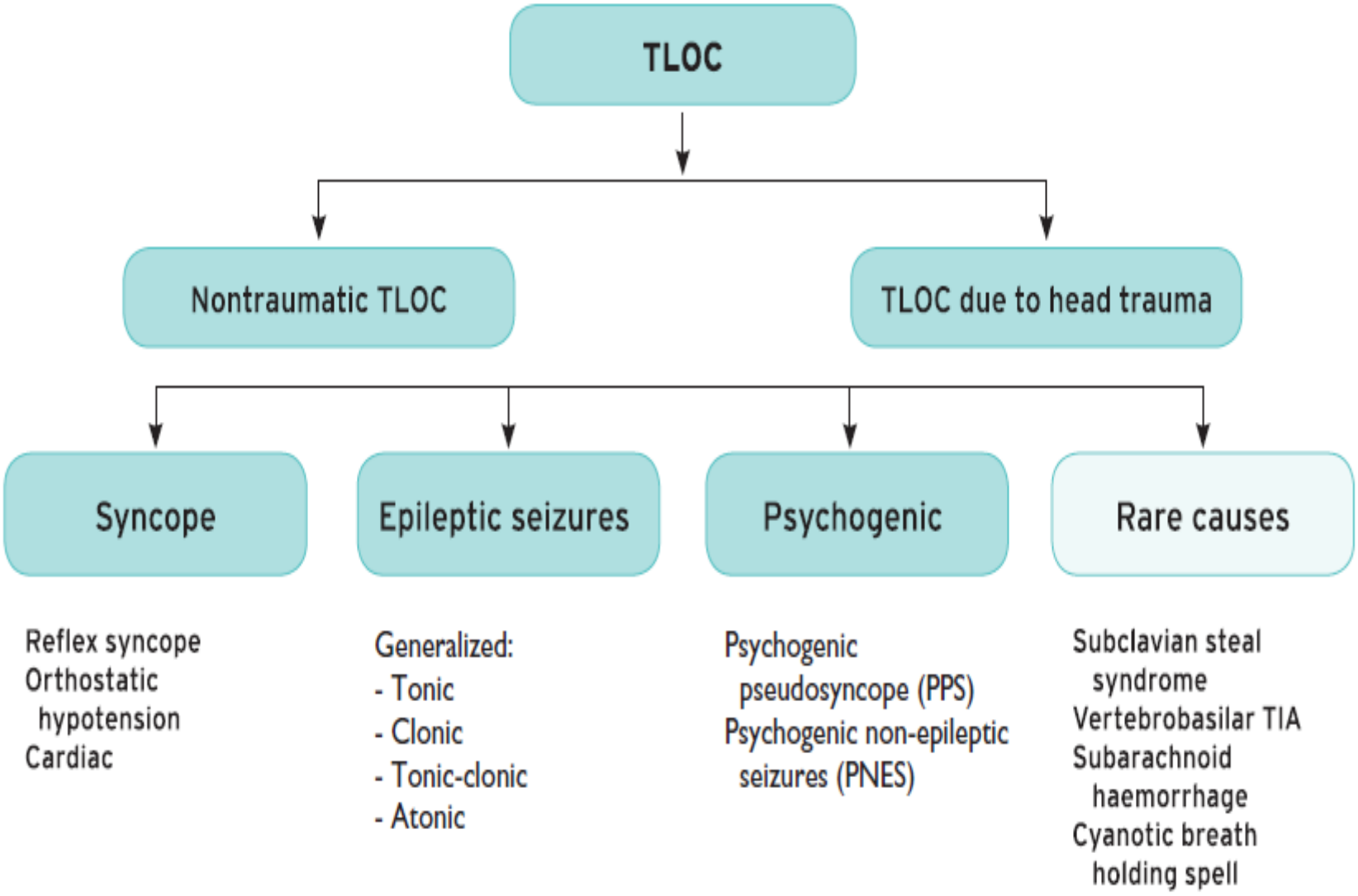
- TLOC is defined as a state of real or apparent LOC with loss of awareness, characterized by amnesia for the period of unconsciousness, abnormal motor control, loss of responsiveness, and a short duration.

- Syncope is defined as TLOC due to cerebral hypoperfusion, characterized by a rapid onset, short duration, and spontaneous complete recovery.

- The two main groups of TLOC are ‘TLOC due to head trauma’ and ‘non-traumatic TLOC

- TLOC groups are defined using pathophysiology:

- ✓ the qualifying criterion for syncope is cerebral hypoperfusion.
- ✓ for epileptic seizures, it is abnormal excessive brain activity .
- ✓ and for psychogenic TLOC it is the psychological process of conversion.


TLOC
Nontraumatic TLOC
TLOC due to head trauma
Syncope
Epileptic seizures
Psychogenic
Rare causes
Reflex syncope
Orthostatic hypotension
Cardiac
Generalized:
- Tonic
- Clonic
- Tonic-clonic
- Atonic
Psychogenic pseudosyncope (PPS)
Psychogenic non-epileptic seizures (PNES)
Subclavian steal syndrome
Vertebrobasilar TIA
Subarachnoid haemorrhage
Cyanotic breath holding spell

Classification of Syncope:

- A sudden cessation of cerebral blood flow for as short as 6–8 s can cause complete LOC. A systolic BP of 50–60 mmHg at heart level, i.e. 30–45 mmHg at brain level in the upright position, will cause LOC.

There are three primary causes of a low total peripheral resistance:

- ✓ The first is decreased reflex activity causing vasodilatation through withdrawal of sympathetic vasoconstriction: this is ‘vasodepressive type’ of reflex syncope.
- ✓ The second is a functional impairment
- ✓ The third a structural impairment of the autonomic nervous system, with drug induced, primary, and secondary autonomic failure.
- In autonomic failure, there is insufficient sympathetic vasoconstriction in response to the upright position.

- There are four primary causes of low cardiac output:

✓ The first is a reflex bradycardia, known as cardioinhibitory reflex syncope.

✓ The second concerns cardiovascular causes: arrhythmia, structural disease including pulmonary embolism, and pulmonary hypertension.

✓ The third is inadequate venous return due to volume depletion or venous pooling.

✓ Finally, chronotropic and inotropic incompetence through autonomic failure may impair cardiac output.

Table 3 Classification of syncope

Reflex (neurally mediated) syncope
Vasovagal:
- orthostatic VVS: standing, less common sitting
- emotional: fear, pain (somatic or visceral), instrumentation, blood phobia
Situational:
- micturition
- gastrointestinal stimulation (swallow, defaecation)
- cough, sneeze
- post-exercise
- others (e.g. laughing, brass instrument playing)
Carotid sinus syndrome
Non-classical forms (without prodromes and/or without apparent triggers and/or atypical presentation)

Syncope due to OH

Note that hypotension may be exacerbated by venous pooling during exercise (exercise-induced), after meals (postprandial hypotension), and after prolonged bed rest

(deconditioning).

Drug-induced OH (most common cause of OH):

- e.g. vasodilators, diuretics, phenothiazine, antidepressants

Volume depletion:

- haemorrhage, diarrhoea, vomiting, etc.

Primary autonomic failure (neurogenic OH):

- pure autonomic failure, multiple system atrophy, Parkinson's disease, dementia with Lewy bodies

Secondary autonomic failure (neurogenic OH):

- diabetes, amyloidosis, spinal cord injuries, auto-immune autonomic neuropathy, paraneoplastic autonomic neuropathy, kidney failure

Cardiac syncope

Arrhythmia as primary cause:

Bradycardia:

- sinus node dysfunction (including bradycardia/tachycardia syndrome)
- atrioventricular conduction system disease

Tachycardia:

- supraventricular
- ventricular

Structural cardiac: aortic stenosis, acute myocardial infarction/ischaemia, hypertrophic cardiomyopathy, cardiac masses (atrial myxoma, tumours, etc.), pericardial disease/tamponade, congenital anomalies of coronary arteries, prosthetic valve dysfunction

Cardiopulmonary and great vessels: pulmonary embolus, acute aortic dissection, pulmonary hypertension

- All forms of syncope, but mostly reflex syncope and OH, are more likely to occur or are more severe when various factors are present: medication causing low BP (due to vasodilatation or hypovolemia), alcohol use, volume depletion (hemorrhage, low fluid intake, diarrhea, vomiting), pulmonary diseases causing reduction in brain oxygen supply, environmental factors (thermal stress).

- There are two main pathophysiological mechanisms in reflex syncope. “Vasodepression” refers to conditions in which insufficient sympathetic vasoconstriction results in hypotension. “Cardioinhibition” is used when bradycardia or asystole predominates, reflecting a shift towards parasympathetic predominance.

- The haemodynamic pattern, i.e. cardioinhibitory, vasodepressive, or both, is independent of the trigger evoking reflex syncope.

- For example, micturition syncope and orthostatic VVS may equally well present as cardioinhibitory or as vasodepressor syncope

- The cardiovascular causes of orthostatic intolerance include classical OH, initial OH, delayed OH, POTS, and VVS, which in this context can be called orthostatic VV.

HOW TO APPROACH

- 1. HISTORY

(THE MOST IMPORTANT PART)

2.PHYSICAL EXAMINATION

3.PARACLINICS

ECG,HOLTER,ETT,HUTT

HISTORY

- The most important part of evaluation is history taking.
- RED FLAGS : CHDs, Family history , Palpitation during or just before the event, Event during physical activity or exercise, HTN, Drugs,…
- Any positive findings during physical examination

PARACLINICS AND OTHER W/U

- ECG
- ECHOCARDIOGRAPHY
- HOLTER
- ETT
- HUTT

- The head-up tilt-table test is only available diagnostic tool to have been scrutinized with regard to its effectiveness in the diagnosis of vasovagal syncope.

- It used to evaluate patients with syncope for 3 decades.

- A positive response is defined as inducible presyncope or syncope associated with hypotension, with or without bradycardia (less commonly asystole).

- The hemodynamic response to the tilt maneuver determines whether there is a cardioinhibitory, vasodepressor, or mixed response.

- Tilt-table testing at angles of 60 to 70 degrees, in the absence of pharmacologic provocation, exhibits a specificity of approximately 90%.

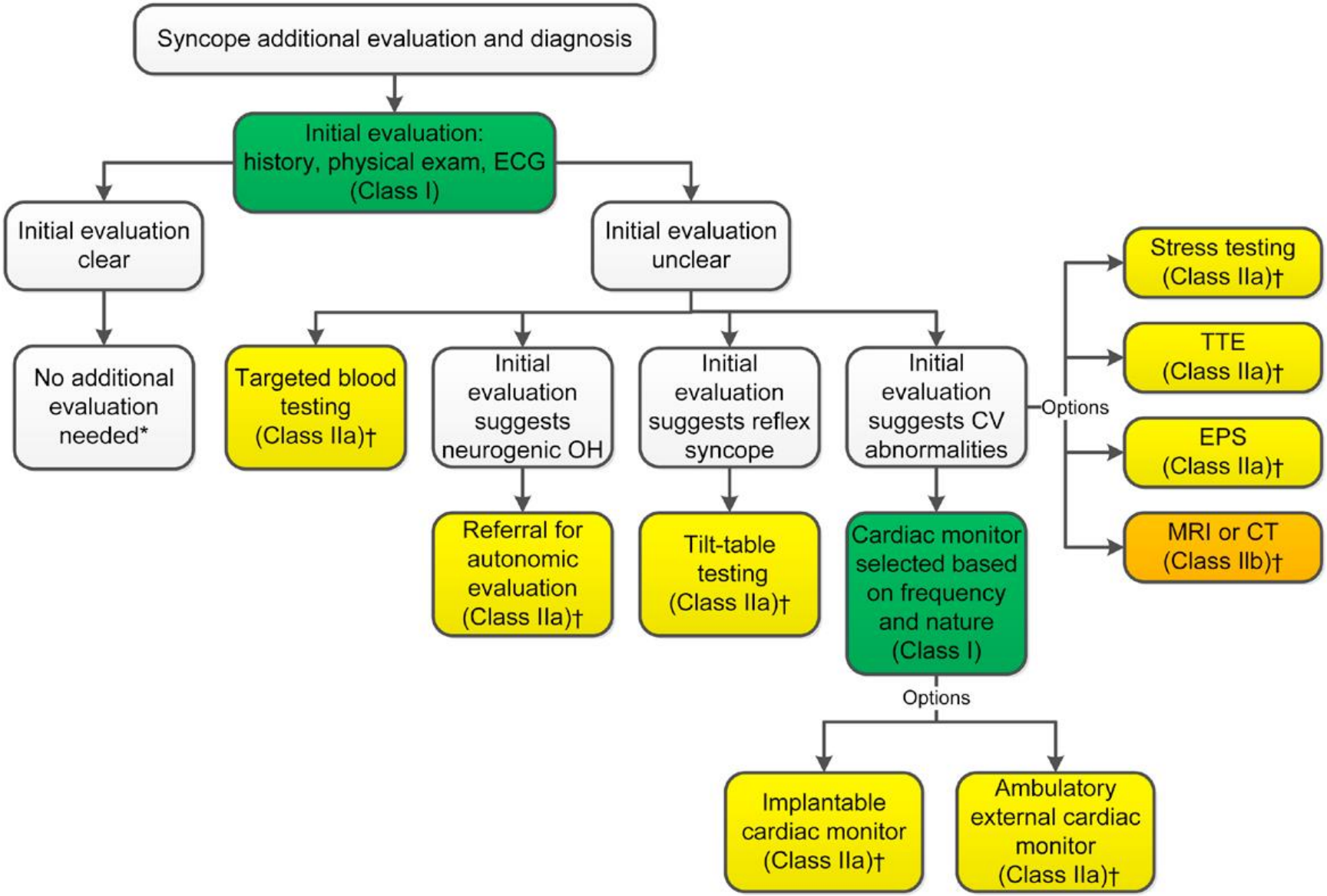
- Pharmacologic provocation may be reduced test specificity.

- Test sensitivity is likely increased with use of pharmacologic provocation.

- Tilt-table testing can be useful for patients with syncope and suspected delayed OH when initial evaluation is not diagnostic. IIa

- Tilt-table testing is reasonable to establish a diagnosis of pseudosyncope. IIa

- Tilt-table testing is not recommended to predict a response to medical treatments for VVS. **III**


Syncope additional evaluation and diagnosis
Initial evaluation: history, physical exam, ECG (Class I)
Initial evaluation clear
Initial evaluation unclear
No additional evaluation needed*
Targeted blood testing (Class IIa)†
Initial evaluation suggests neurogenic OH
Initial evaluation suggests reflex syncope
Initial evaluation suggests CV abnormalities
Options
Stress testing (Class IIa)†
TTE (Class IIa)†
EPS (Class IIa)†
MRI or CT (Class IIb)†
Referral for autonomic evaluation (Class IIa)†
Tilt-table testing (Class IIa)†
Cardiac monitor selected based on frequency and nature (Class I)
Options
Implantable cardiac monitor (Class IIa)†
Ambulatory external cardiac monitor (Class IIa)†

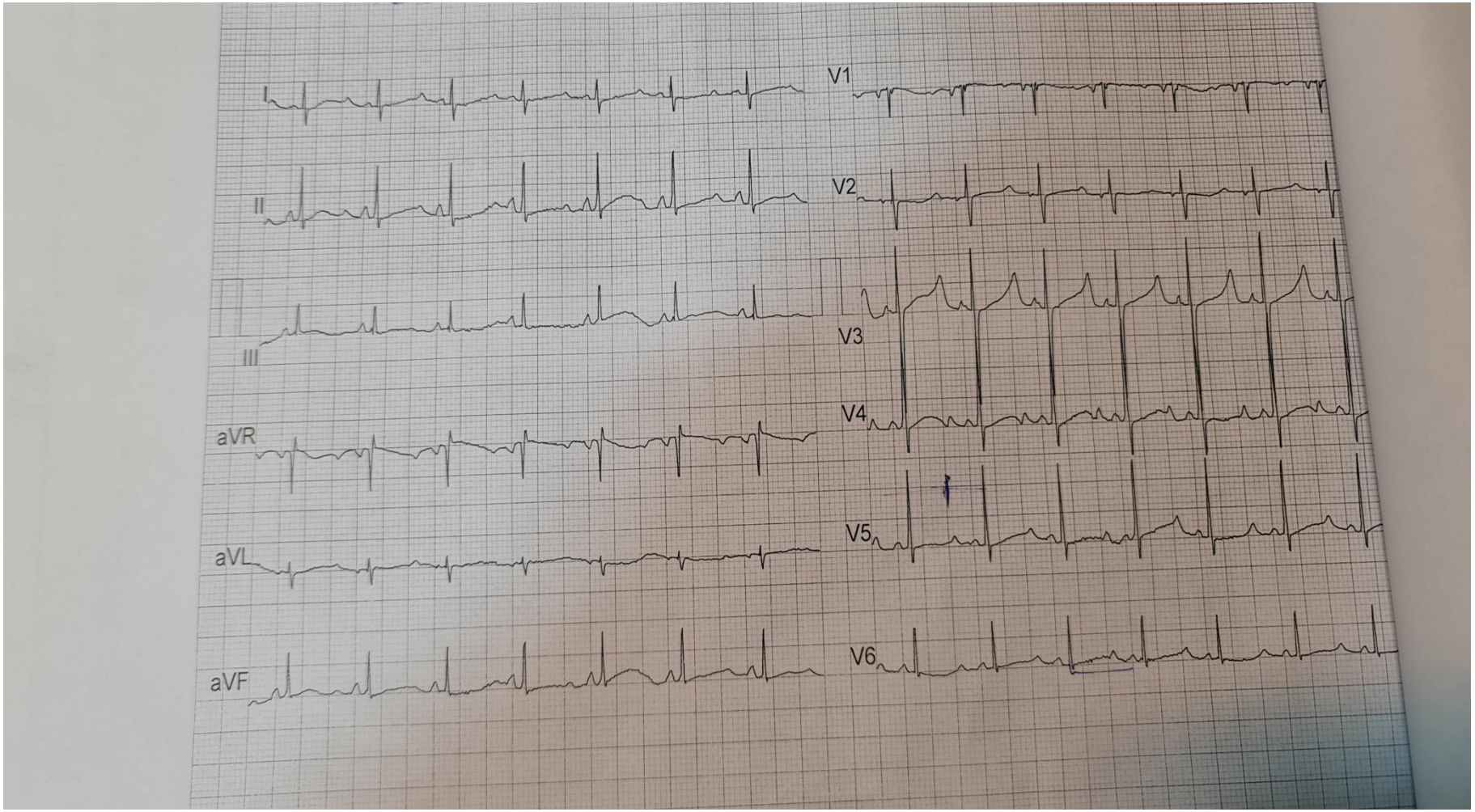
TREATMENT

- In patients with VVS :
- 1. Avoid situations that increase the risk
- 2. Avoid dehydration and fasting
- 3. Increase salt intake
- 4. Physical training
- 5.Beta blockers
- 6.Flodrocortisone

TREATMENT CONT..

- IN PATIENTS WITH ARRHTHMIAS OR CHDS AND SYNCOPAL ATTACKS DUE TO THE SEIZURE DISORDERS CONSIDER SPECIFIC MANAGEMENT OF THE PATHOLOGY.

A RARE CASE PRESENTED BY SYNCOPE



THANK YOU ALL FOR YOUR ATTENTION

- FEEL FREE TO CONTACT ME IN THE SUSPICIOUS CASES.
- BEST REGARDS